

## ABSTRACTS OF ORAL PRESENTATIONS

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#### ON COMMUNITY BASED COMBINED LEP- ROSY AND TUBERCULOSIS CONTROL WORK IN NAVI MUMBAI

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This paper is an attempt to reflect on and derive lessons on work which combine two disease control programmes - Leprosy & TB.

The paper begins with a narration of ALERT-INDIA's community based leprosy and TB control work in the past 12 years.

It also brings out the crucial differences between two diseases in terms of socioeconomic and psychological characteristics. Keeping in view these differences, the paper proceeds to discuss the strategies and epidemiological features of the control programmes.

Finally, it highlights the major differences that emerge in the implementation of such programmes. Thus yielding valuable and critical aspects that need to be embodied in meaningful training programmes for both organisations and workers desirous of taking up such combined disease control programmes.

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### Co 88

#### LEPROSY CARE IN GENERAL HEALTH SERVICES - EXPERIENCES IN BIHAR, INDIA

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Intensive Leprosy Control activities have been sustained in Bihar State, India since 1996. Modified Leprosy Elimination Campaign (MLEC) was done twice from 1996 to 2000, involving general health services. During MLEC 1998, a system was devised so that leprosy care services are offered at all PHCs/Taluk & District hospitals at least one day a week (Tuesday). NLEP staff was also made available on this day at these centres. It was observed that this system offered following advantages.

- Leprosy care services were made available at general health services.
- There was active participation of different cadres of general health care personnel in leprosy programme.
- PHCs were recognised by the people as service provider for leprosy too.

Details on patients diagnosed and treated at PWCs will be presented.

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#### MYCOBACTERIAL DISEASE CONTROL IN A METROPOLIS OF SOUTH INDIA

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Gremaltes Referral Hospital & Leprosy Centre was started in 1971 for leprosy control work in the northern part of Chennai. It added tuberculosis control programme to its work in a phased manner from 1992.

49818 leprosy patients have been treated through the control programme working under the aegis of the National Leprosy Eradication Programme covering an area of 70 sq.kms over three decades. With the fall of leprosy prevalence to 6/10000 from 140/10000 in 1971, it was decided to integrate tuberculosis control work under the revised National Tuberculosis Control Programme. Initially we covered six corporation divisions and later on expanded RNTCP to the whole project area. Chennai district came under the RNTCP Dots Programme in 1999 in collaboration with the Corporation of Chennai. 195 sputum positive cases, 122 sputum negative cases and 13 E.P. cases have been treated from 1992 onwards. In other hospitals 166 sputum positive, 122 sputum negative and 22 E.P. cases belonging to our area are taking treatment.

The possibility of integrating TB-RNTCP Dots Programme into an already existing NLEP programme in an urban area is being presented.

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### Co 141

#### HARMONIOUS AMALGAMATION OF LEPROSY FUNCTIONS WITH GHC SYSTEM IN DISTRICT MANDLA

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Vertical NLEP Programme cannot run indefinitely being expensive especially when the prevalence rate has come down considerably. Vertical staff alone cannot generate awareness about Leprosy. Mandla is a tribal district with population of 9,50,000 with 1178 villages

in 9 blocks. Due to hills, rivers, nalas and dense forest, MLTU vehicles could not reach to deliver MDT drugs at many DDPs.

After consultation with the Chief Medical and Health Officer, a two day consensus building workshop was organized at District Training Center, Mandla in which one DLO, one BMO and 4 MPWs (2 Male and 2 Female) from Balaghat and one DLO, BMOs, BEEs and MPWs Male and Female (from Seoni District) were invited to discuss whether selected NLEP functions can be amalgamated with GHC system.

During the workshop, situation was analysed and the consensus was reached to amalgamate selected NLEP functions.

Accordingly, block wise task oriented training of GHC staff for capacity building was carried out on 2nd October '98.

It was observed that record keeping and reporting was not done as per expectations. As a result of this intervention in the district, number of voluntary reporting of cases has increased. The regularity of UT cases at health facility point has increased. MPWs have accepted NLEP function given as one of their responsibilities. The integration has been found feasible and result oriented.

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#### INTEGRATION STRATEGIES FOR LEPROSY CONTROL PROGRAMMES - A MODEL OF EVALUATION

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There are many kinds of leprosy projects operating across the globe. Now is the time for reflection and analysis, for each project to examine its systems, strategies and structure in the context of integration of leprosy into general health services.

An evaluation of an ongoing project with control programme and an IP ward is done to assess the strategies and structure it should adopt in the view of integration. This is important, as there are many other stakeholders with different roles in the field of leprosy. The plans of the Government and other funding agencies in terms of capacity building, IEC, POD, MDT reconstructive surgery are analyzed and it is decided that the strategies of the individual project should complement these efforts. Data was collected and analyzed from PHC / LEC, the district level and state level. This is in addition

to the internal analysis done within the project. Through this evaluation, a model has been evolved to formulate strategies for leprosy projects.

The authors propose to discuss the model adopted and its relevance in the process of integration.

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### Co 174

#### IMPLEMENTATION OF A JOINT LEPROSY/TB PROGRAMME IN AN ONGOING TRIBAL LEPROSY PROJECT - STRATEGY, RESULTS AND PROSPECTIVE ROLE OF NGOS IN IMPLEMENTATION OF RNTCP

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LEPRA India has established a leprosy project in two tribal districts in Orissa. The project covers a population of 1.5 million, predominantly tribal and distributed in 6096 villages located in difficult terrain. 8 tribal dialects are spoken by people, making communication a challenging task. The project has implemented leprosy programme by SET method. 14201 cases were treated with MDT. Based on an analysis of data collected from PHCs, it was realized that TB was a major problem that could also be tackled as a joint programme.

A joint Lep/TB programme was implemented from 1996 in a population of 2.5 lakhs within the project area. The staff has undergone training in implementing the programme. Necessary infrastructure to implement the programme was created. Initially, active case finding programme was taken up to identify TB symptoms. Subsequently, passive case finding methods were adopted. Only sputum positive cases are treated. DOTS was implemented as treatment strategy. Anganwadi workers are trained and utilized as DOTS providers. 1010 sputum cases were registered for treatment and 647 cases were cured during the last three years. The district in which this programme was implemented has now been recognized as RNTCP district. This has necessitated a revision in the strategy of participation of LEPRA India in the implementation of the TB programme.

In this paper, the implementation of TB programme as a joint programme, the results obtained, the role of local leaders and peripheral health workers as DOTS providers in difficult to reach areas and the specific areas in which a NGO working in leprosy could participate in RNTCP are presented.

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#### USE OF HEALTH CARE SERVICES AND UNMET HEALTH CARE NEEDS

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Green Pastures Hospital serves as a tertiary leprosy referral centre for the Western region of Nepal. Patient records of 142 leprosy patients from Kaski District registered for treatment between July 1991 and July 1995 were reviewed. This comprises 91% of patients registered in the district during that time. Their use of hospital services during the time from registration to RFT or up to three years (whichever came first) was reviewed.

Three patients were incorrectly diagnosed leaving the actual number of leprosy patients reviewed to 139. Of them, 65% were male and 35% female. Child proportion was 5.8%. Majority of cases (76%) were classified as multibacillary and the remainder (24%) paucibacillary. Highest skin smear was over 4+ in 22% of cases. At the time of diagnosis, 20% had WHO grade 2 impairments and 16% had grade 1 and 64% had no impairments.

The patient records were reviewed for number and length of hospital admission, number of patients treated for reaction, or having reconstructive surgery. In addition, it was assessed how often nerve function assessments were performed and how many patients received treatment for complicated ulcers, eye care, cataract surgery, protective glasses, protective footwear and late patient tracing. At the same time the indications for interventions were identified. The absence of interventions when indicated were referred as unmet health care needs.

In this cohort 27.7% had at least one admission during the follow-up time. The total number of inpatient days in the cohort was 4293 days. At least one prednisolone course was given to 51 patients (39.8%) during the follow-up time. Total of 66 pairs of protective footwear was given to 27 patients. Complicated ulcers (n=23) were treated in 13 patients. Only 6 reconstructive surgery operations were done during the follow-up.

In summary, this study is a documentation of the use of health care services by leprosy patients in Kaski District as part of the catchment area of Green Pastures Hospital. At the same time it is believed that the design of this study leads to underestimation of the actual unmet health care needs.

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### Co 324

#### HEALTH REFORMS THROUGH HEALTH AND POPULATION SECTOR PROGRAMMES CODE (HPSP) IN BANGLADESH - SALIENT FEATURES AND EXPECTED IMPACT ON DISEASE CONTROL, ELIMINATION AND ERADICATION

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Bangladesh has introduced major health reforms since July 1998. The main thrust of the reforms has been the sector-wide approach and the implementation of an ESSENTIAL SERVICES PACKAGE (ESP). The priority areas of the ESP are :

- a) Child Health
- b) Reproductive Health
- c) Control of Communicable Diseases
- d) Limited Curative Care
- e) Behavior Change Communication (BCC)

In the new structure, leprosy elimination comes under Line Director (ESP) and a Programme Manager-Communicable Disease Control, with a Deputy Programme Manager (Leprosy) as the focal point. All activities like training, procurement & LEC are combined for all programmes under the overall supervision of the respective Line Directors.

The most peripheral unit of ESP will be the COMMUNITY CLINIC to be established at one clinic for every 6000-8000 population. It is planned to establish a total of 13,500 community clinics country-wide. All basic and essential health services will be provided through these fixed clinics to be run by two (2) health workers-one male and one female. The referral services will be provided at the Thana (sub-district) level through the Thana Health Complex which has provision of 31 beds and outpatient services.

The impact, advantages and disadvantages of the new system with particular reference to the National Leprosy Programme will be presented and discussed.

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**Co 326****COMBINED TUBERCULOSIS AND LEPROSY CONTROL PROGRAMMES - THE BANGLADESH EXPERIENCE**

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Bangladesh was one of the first countries in the world to operate a combined Tuberculosis and Leprosy Control Programme, under a single Project Director. The combined programme commenced in 1985 and was accelerated in 1993 under a GOB/World Bank/WHO project.

Though TB and leprosy have certain commonalities like the cause (mycobacterium), mode of transmission (airborne), similar microscopy techniques and Rifampicin as the most potent drug for both diseases, there are major differences in operational objectives and strategies.

Though the two programmes were combined in Bangladesh, the expansion of TB and Leprosy Services and some of the activities connected with the country-wide expansion were separately implemented. The benefits, advantages and disadvantages of the combined TB and leprosy programmes within the Bangladesh context are presented and discussed.

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**Co 335****CO-OPERATION BETWEEN NATIONAL AND INTERNATIONAL N.G.O.s IN THE FIGHT OF LEPROSY - YEMEN EXPERIENCE**

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Leprosy in Yemen is considered as a public problem more than a health problem. Before 1964, leprosy patients were subjected to an obligatory isolation in unsanitary houses outside the main cities. Between 1973 and 1982, some leprosy patients were given medical care by dapsone monotherapy. Though MDT was officially adopted in Yemen in 1983, there were no real leprosy control activities due to lack of support till an agreement between Ministry of Public Health (MOPH) - Republic of Yemen and German Leprosy Relief Association (GLRA) - Wurzburg - Germany was signed in 1989.

In 1992, a local non-government organization called Yemen Leprosy Elimination Society (YELEP) was formulated. This society together with GLRA further strengthened our fighting against leprosy in Yemen. With the support of GLRA, YELEP and other national and international non-government organizations, the prevalence of leprosy was brought down from 0.70 per 10,000 population in 1992 to 0.32 per 10,000 population in 1999.

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**Co 383****EFFECTS OF MLEC ON MASS-AWARENESS**

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Modified Leprosy Elimination Campaign (MLEC) 98-2000 was a very successful drive in Bihar. It also produces a good effect on mass-awareness in the people of Bihar. The collection and analysis of data shows more voluntary reporting than previous reporting year.

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**Co 17****REPEATED IMPLEMENTATION OF MLEC CAN BRING DOWN THE INCIDENCE OF LEPROSY IN THE COMMUNITY**

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The concept of the MLEC for the achievement of elimination of leprosy in our country and as well as in the State of Orissa has brought a revolutionary change in the incidence of the disease. During MLEC-I, which was implemented in the State of Orissa from 30th January to 5th February, 1998, 62844 leprosy cases were detected by examining 33857823 nos of persons whereas during MLEC-II which was implemented from 30th January to 4th February, 2000, only 27197 leprosy cases were detected by examining 27715988 nos. of persons. The detection rate during MLEC-I was 18.56 / 10,000 population and 9.81 / 10,000 during MLEC-II.



The 47.14% fall in detection rate just in 2 years interval indicates that repeated implementation of MLEC with more than 80% coverage of population can help in bringing down the incidence of the disease which will finally help in achievement of elimination of leprosy sooner than expected in the State of Orissa.

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#### LEPROSY ELIMINATION CAMPAIGN IN SELECTED DISTRICTS OF KARNATAKA AND KERALA

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There was a reduction of over 50% in registered PR in Shimoga district of Karnataka and Kottayam district of Kerala while NCDR has declined only in Shimoga district between 1995-2000. However, in Gulbarga district of Karnataka with Pre-MDT PR of over 80/10,000 brought under MDT in 1989 has shown a marked decrease in PR to 6 by 1995. No marked change could be observed in PR and NCDR in the district between 1995-2000, perhaps because of increased case detection during MLECs. MLEC-2 has resulted in detection of smaller number of cases in all the three districts compared to MLEC-1. VRC approach was followed in MLEC-2.

The consistently very high child PR in Gulbarga district during the last six years is a matter of concern. The results of the findings will be detailed. Constraints observed in the district/state as well as recommendations suggested to overcome them will be discussed.

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#### LEC IN LIMKHEDA TALUKA OF PANCHMAHALS DISTRICT

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The Panchmahals District is a high endemic tribal district of the Gujarat State. The Limkheda taluka in particular has very difficult to reach terrain and high migration rate of tribal people. The total 242 villages having a population of 3,29,644 will be covered with total 84 Leprosy Assistant/Leprosy Supervisors. The Primary Health Care staff, including M.O.-PHCs, MPHSs, MPHWS, AWWs are given one day orientation training. The case detection will be carried out during 10th July to 31st July, 2000. The preliminary report of the first four days

suggests high prevalence rate in the taluka. The details of the results will be discussed during the presentation.

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### Co 55

#### RESULTS OF LEPROSY SURVEYS AFTER MLEC

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Active survey for leprosy case detection with the help of paramedical staff of general health services was carried out after VRC programme in Mumbai as a part of MLEC-2000. Following this large scale campaign, the active survey was undertaken in three health post pockets by the PMWs of leprosy vertical programme where no or very few leprosy cases were detected by the general health staff.

The comparative results of MLEC and post-MLEC surveys in three urban pockets were as follow :

Pocket-1 Pocket-2 Pocket-3 Total

MLEC Post- MLEC Post- MLEC Post- MLEC Post-  
MLEC MLEC MLEC MLEC

Population 27293 9533 69519 32211 101454 18180  
198266 59924 Enumerated

Population 19008 5785 41097 18731 64604 11036  
124709 35552 Examined (70%) (61%) (59%) (58%)  
(64%) (61%) (63%) (59%)

New Cases 1 10 0 8 6 21 7 39

NCDR/ 0.52 17.3 0 4.3 0.9 19.0 0.6 11.0 10000

These findings call for look into the reasons for such difference in NCDR. In view of forthcoming integration of leprosy with general health services, these results also question abilities of general health staff in carrying out basic leprosy surveys.

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### Co 110

#### VOLUNTARY REPORTING OF LEPROSY CASES IN REFERENCE TO MLEC II AND V.R.C.CAMPAIGN

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In Madhya Pradesh, V.R.C. campaign was organised on 21 & 22 July, 2000 and Modified Leprosy Elimination Campaign was conducted in the month of February 2000.

A total of 53 cases in VRC and 275 cases in MLEC-II were registered.

New registered cases were interviewed for knowing the reasons for not being detected in MLEC-II. The data collection was done by either NLEP worker or supervisors.

Result of VRC campaign shows that 20% of cases were absent during MLEC-II, 60% of cases were ignorant about the signs & symptoms of leprosy, 8% of cases although had doubt in mind but kept hidden in their homes during campaign, 12% of cases could not get any answer to the questions asked.

The study indicates that ignorance in cases of leprosy is more than 60% of cases and the IEC should be incurred and strengthened.

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#### THE MLEC IS A VIAMEDIA FOR INTEGRATION OF NLEP WITH GENERAL HEALTH CARE SYSTEM

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As per WHO, one of the strategies for achieving elimination of leprosy is the broadening of the MDT service. The MDT services under NLEP in India as well as in Orissa is implemented through specialised vertical infrastructure. This system has been proved quite effective in tackling the enormous leprosy problem in the State of Orissa. But at certain point of time, the vertical system becomes incapable in controlling the transmission of the disease and also in bringing down the prevalence rate of leprosy further below as it has got limited potentiality to provide extensive coverage. So the MDT services cannot be made broadbased with vertical system unless the General Health Care System (GHCS) which has got enormous potentiality to give extensive coverage is completely involved and given full responsibility of NLEP.

Two successive rounds of Modified Leprosy Elimination Campaigns (MLEC) in Orissa has proved that the MLEC is the best via-media for activating involvement of the GHCS in leprosy elimination process. Now the NLEP in the State has been functionally integrated with GHCS in all the districts. With functional integration, the programme is made broadbased. The coverage has been remarkably improved and the cases

are now being detected at quite early stage and immediately put under MDT which reduces the potentiality of a patient to transmit the disease in the community. Treatment compliance has increased to almost 100%. Disability rate amongst new cases has reduced drastically below 1%. It has generated tremendous confidence in people to believe that leprosy is just like any other communicable disease and can be fully cured and services are available all the time within their reach. This has caused in high increase (80%) in voluntary reporting of new cases. These findings indicate that Orissa has got bright prospective for achieving elimination of leprosy sooner.

And these all could happen due to successful implementation of MLEC-I and II in the State by adopting the holistic approach of total involvement and ownership of General Health Care System in the programme.

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#### POST MLEC FOLLOW-UP CAMPAIGN FOR MOPPING UP LEPROSY CASE DETECTION

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Modified Leprosy Elimination Campaign (MLEC) was done twice in most of the leprosy endemic districts in India since 1998. Large number of new leprosy cases had been detected. There was inadequate follow-up of the impact of the intensive health education done during MLEC. Technical support team in Katihar district, Bihar tried another quick LEC. One block in the district (Balrampur) was randomly selected. A team consisting of one Medical Officer and two non medical leprosy workers visited 107 villages in one month. Quick propaganda was made in the village and workers examined people gathered at that spot. A total of 100 new leprosy cases were detected. During MLEC 89 new cases were detected in the same block with active search programme. Such programmes can be done by the existing leprosy programme personnel. This kind of follow-up action could improve the cases detection in leprosy endemic regions and hence elimination process.

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**Co 173****LEPROSY ELIMINATION CAMPAIGN IN BIHAR : THE LESSONS TO LEARN**

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The second Modified Leprosy Elimination Campaign was carried out in Bihar in March 2000. It resulted in the detection of about 82000 new cases. A systematic evaluation of the campaign was done by the DFIT support teams placed in 20 districts in Bihar. The team selected one block in each district by random, screened all the suspects identified during the campaign.

Totally 7921 suspects were identified and from them 2238 cases were detected by the programme. Only 63% had been screened by the programme. Of those screened, 45% were new cases, 3.8% old cases and 51.2% not cases. 94.5% of cases seen by the team were found to be cases. About 3% of non-cases were found to be cases. About 11% of unscreened were cases. The teams detected 1200 new cases in the selected block during the exercise.

The consequences to the programme and to the strategy are discussed.

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**Co 251****RESULTS OF IMPLEMENTATION OF LEPROSY ELIMINATION CAMPAIGNS IN THE HIGH ENDEMIC AREAS OF LEPROSY IN YUNNAN, GUIZHOU AND SICHUAN PROVINCES**

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The effectiveness of activities of leprosy case finding in the implementation of Leprosy Elimination Campaigns (LEC) integrated with routine leprosy program in the high epidemic areas of leprosy in Yunnan, Guizhou and Sichuan Provinces in 1999 were evaluated. Extensive leprosy health education in the community, leprosy training of primary health workers, implementation of clue survey, contact survey, diagnosis and treatment were carried out. A total of 122 new leprosy cases were detected in 6 high epidemic counties of leprosy through LEC in 1999 with a detected rate of 3.7/100000. In the last 3 years, the annual number of newly detected leprosy cases was only 67 cases

and the rate of case detection was 2/100000 on an average. Among the newly detected leprosy cases, about 47% of cases were leprosy household contacts. LEC combined with routine activities of case finding can promote the detection of the back-log leprosy cases in the communities. In the high epidemic areas of leprosy, especially in the remote and difficult-to-access areas, most leprosy cases can be detected by active and passive case finding methods through extensive health education, skin clinic, leprosy contact survey and clue survey.

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**Co 327****NATIONAL LEPROSY ELIMINATION CAMPAIGN (N-LEC) IN BANGLADESH - ACHIEVEMENTS AND LESSONS**

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A six (6)-day National Leprosy Elimination Campaign (N-LEC) was implemented countrywide in Bangladesh in February, 1999. The salient features of N-LEC were :

- a) Implemented in all 64 districts, 460 thanas (sub-district), 103 municipalities and the 4 metropolitan cities of Bangladesh.
- b) A total of 45,400 health workers and community volunteers were directly involved in the 6-day campaign.
- c) Sixty three million of the population (52% of the country) was directly contacted through rapid photo survey conducted in about 61,000 villages (87% of the total villages) and 44,000 schools of the country.
- d) Prior to the campaign a total of 33,000 Imams (religious leaders) and 28,000 local community leaders were contacted through advocacy meetings.
- e) The campaign was supported by extensive country-wide media coverage.
- f) The campaign activists referred 60,878 suspects, of whom 2,435 new cases (PB-1198/MB-1237) were detected.

The impact, cost-effectiveness and the lessons learnt from this country-wide campaign are discussed.

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### Co 384

#### LEPROSY ELIMINATION - EVERYBODY'S RESPONSIBILITY

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##### Introduction

On reaching the goal of elimination, Urban Leprosy Eradication will remain to be a burning problem, if not addressed properly.

##### Context

- Peculiar nature of urban problem - Modified Leprosy Elimination Campaign (MLEC) as an intervention - MLEC I Feb. 1997 strategy, NLEP to people - Active

- MLEC II Jan 2000 strategy people to NLEP - Passive

Outcome of both almost same. (Details found in the presentation paper).

Information education communication very effective means to augment of case finding through voluntarily reporting.

MLEC Phase II found to be more rewarding for the following reasons:

- People suspect disease by themselves by identifying signs and symptoms.
- Awareness generated among a big mass which is the investment for future.
- Inter personal communication is more effective than the other methods which is more sustainable.
- Opportunity for people to take part in leprosy elimination.
- Expansion into many hands other than leprosy service providers.
- Involvement of various strata of the community i.e., broad based should be the ultimate goal.

##### Conclusion

It is strongly believed that leprosy elimination lies in people's hand which includes community, NGOs, Self Help Groups, women/men/youth groups along with Govt/NGOs meant for leprosy.

Data and other relevant information are provided in the presentation paper in the urban context.

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### Co 10

#### EXPERIENCES OF SAPEL PROJECTS

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SAPEL is one of the initiative suggested by WHO for implementation of MDT in the under served area and under served population. Madhya Pradesh State is spread over an area of 4,42,466 sq. km. with population of 79968265 (1999). 23% population is tribal and 14% are scheduled caste. The physical features are characteristic of undulating topography with low hills of Vidhyachal and Satpura range, narrow valleys, plateaus and plains. The state has nearly one eighth of total forest area of the country. Almost one third area of the state is covered by forest. MDT has been implemented in M.P. in phased manner, giving priority to high endemic districts from 1987-88. By the year 1992, all high endemic districts and by April 1995 remaining districts were covered under MDT. Prevalence rate of state had reduced from 43.4/10000 (1987) to 4.4/10000 (March 2000).

47 SAPEL projects were started in 21 districts during 1999 resulting in the following outcome - No. of village covered 2,004 Population covered 13,47,710 Population surveyed 9,53,594 (71%) Volunteers selected, covered and trained 2,612 Volunteers actually used 2,405

Female among volunteers 1,203(50%) No. of cases suspected for Leprosy 4,628

No. of cases confirmed, registered and put on treatment 981

(349 MB+555 PB & 77 SSL)

Most of the cases under treatment in SAPEL areas are receiving MDT through the volunteers. The services of volunteers were supported by NLEP/PHC workers in the form of drug-supply-monitoring, case confirmation, referral services for complicated cases, record keeping & reporting and monitoring the programme. The experiences gained & lessons learned are valuable for planning & execution of more such SAPEL projects in the state.

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### Co 22

#### ALTERNATIVE METHODS OF NEW CASE DETECTION IN DISTRICT TIKAMGARH

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Case detection & MDT coverage is the first priority during present stage, i.e., leprosy elimination. Many



people do not come forward for examination during house to house survey due to stigma and ignorance. Therefore alternative methods of new case detection became a necessity.

Apart from MLEC & SAPEL, following methods were tried for new case detection: organizing skin disease diagnosis, therapeutic and educational camps (SD-DTEC) in short, called skin camp.

Own family survey by students of high school.

Screening of persons/patients attending out patient department of Government Hospital/ Dispensary.

Invited survey (Sarpanch invites NLEP team to examine villagers, collected on particular day).

District Tikamgarh adopted the first method that is organizing skin camp throughout the district, and throughout the year involving GHC system. The objectives of organizing these skin camps were - a. To educate the community about what leprosy is and what leprosy is not by demonstration methods.

b. To detect new (untreated) leprosy cases.

c. To treat common skin diseases, free of cost.

d. To bring openness for diagnosis and treatment of Leprosy.

115 camps were organised during 1999, 676 new cases were detected, registered and put on MDT.

Continued on next page Key persons of the area (Village/Ward) were involved in planning and organizing skin camps. Community resources were mobilized, e.g. contributing drugs required by pharmaceutical companies & medical shops, volunteers for announcement & spreading awareness, furnished venue by school/panchayat/community halls and temples.

It was observed that these camps helped in zeroing distances between community and leprosy cases along with new case detection. This initiative has been adopted as a strategy throughout the state.

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## Co 41

### EARLY LEPROSY CASE DETECTION BY VOLUNTEERS IN DIFFICULT AREAS IN THANE DISTRICT

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House to house leprosy case detection is very expensive and time consuming if we depend only on regular

trained Paramedical staff. Given the fact that sufficient number of trained paramedical personnel are not available, one may have to seek alternate human resources for the primary task of leprosy case detection. ALERT was required to survey for identifying new cases in far flung remote villages of Thane District that had become part of the Navi Mumbai Municipal Corporation limits in the recent years and is also part of ALERT's leprosy control project area (formally under Zilla Parishad leprosy control units). There was an urgent need to ascertain the leprosy situation in 40 villages newly added.

As qualified persons were not available, particularly because numbers were not adequate to complete the survey within a short period of 5 to 6 months, ALERT decided to engage volunteers and give them intensive training to identify cases of suspected leprosy. Thus, 13-H.S.C. qualified youth from the slum areas were selected. The volunteers were paid Rs.75/per day. As these villages were not connected by bus route, transport was also provided for staff to reach the villages and move from one to another.

In a short period of 133 working days (between November 99 to April 2000), these volunteers made house-to house visits and examined 1,29,383 persons in 40 villages. Volunteers suspected 332 leprosy cases. Of these, the doctors and trained paramedical workers of ALERT-INDIA confirmed as high as 54 per cent as leprosy cases. A further 10% were kept under observation. This study indicates that a significant number of new cases (NCDR - 14 / 10,000) has been detected with less expenditure and in a short duration by utilising the services of adequately trained volunteers in difficult areas too. Thus, the use of a voluntary force has yielded appreciable results, the use of such personnel is both economical and commendable in quality of work.

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## Co 69

### COST EFFECTIVE METHOD OF NEW CASE DETECTION IN URBAN SEONI - WITH SCHOOL STUDENT INVOLVEMENT

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Seoni a small town in M.P. and a District H.Q. has a population of about 70,000. Leprosy survey work in city is difficult because of limited staff and problems inherent of any urban population. Hence a cost effective

tive method of survey by which all the citizens could be covered was planned taking the help of school students while carrying out school survey. All the students above 5th standard were given health education regarding leprosy, going to each & every class of school and then they were given a simple form to fill up at home as their homework after examining all family members.

In the format, students were asked to write about total number of family members and name of all persons in family suffering from any skin problem. Next day all the forms were collected and persons with skin problems were listed as suspected case and were called to attend free skin disease diagnostic camp in the school. In this method 720 skin disease suspected cases attended 8 camps over one year and 25 new cases of leprosy detected.

In this activity about 17,000 school students were directly surveyed by NLEP staff in 55 schools of Seoni in Jan, Feb 99 & then July to Nov 99 i.e. in 6 months time and more than 4000 families i.e. about 25,000 people surveyed by middle & high school students. Total 800 cases were suspected from a population of 40,000-45,000 and 25 new cases of leprosy could be searched from students and their families which were otherwise not taking advantage of Urban Leprosy Centre.

Thus this activity to search hidden cases which surveyed more than half the population of the town could be done with just two NLEP staff and one M.O. without any extra cost for detection of new case.

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### Co 138

#### THE STRATEGY OF 'SPECIAL LEPROSY CASE DETECTION CAMPAIGN' THROUGH VOLUNTARY REPORTING CENTRE (VRC) IS NOT GENDER SENSITIVE

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Recently, on 21st & 22nd July 2000, as per instructions of Govt. of India, a Special Leprosy Case Detection Campaign through Voluntary Reporting Centre (VRC) was launched in the State of Orissa At every health institutions of the State, including public and private sectors, the Voluntary Reporting Centers were established. Each VRC was managed by one Medical Officer, one Para-medical Worker (PMW) and one Health Worker (M/F). The VRCs were opened from morning 8 o'clock to evening 5 o'clock on 21st & 22nd July 2000. Atleast from 15 days prior to VRC dates, an intensive public awareness activities was launched through electronic media (AIR & Doordarshan). Special programmes which were developed by AIR and

Doordarshan with help from BBC WT were telecasted and broadcasted at prime time. With message to people regarding holding of Special Voluntary Reporting Centres at every health institutions of the State and regarding signs and symptoms of leprosy and such persons were requested to report at Voluntary Reporting Centre (VRC) and get himself or herself examined and get free MDT, if confirmed as suffering from leprosy.

Apart from programme through AIR & Doordarshans, mike announcements, hand bills distribution, banner display at strategic points regarding holding of VRCs were done by the District Leprosy Societies for publicity of VRC.

Preliminary reports from few districts shows that out of total 6257 persons reported at the VRCs only 2227, i.e. 35.6% were female and out of total 351 cases were confirmed, only 125 cases (35.6%) were female. Whereas during MLEC-II more numbers of female population was examined and equal numbers of male and female leprosy cases were detected in the State just 6 months back. So this outcome of Special Leprosy Case Detection Campaign indicates that the VRC strategy is not a gender sensitive strategy.

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### Co 143

#### SPECIAL ACTIVE PROJECT OF ELIMINATION OF LEPROSY (SAPEL) IN BHANDARA DISTRICT, MAHARASHTRA

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Project was undertaken to strengthen the MDT activities to eliminate leprosy in problematic/ remote areas with the help of community awareness and case holding programmes.

There are 14 blocks in Bhandara District - 4 are tribal out of these. The total population of the district is 21,03,276 and total number of villages is 1643 plus 5 towns. Tribal population is 3,76,349 and the number of tribal village is 432.

MDT Project started from 8th December 1988 and the whole district is covered under the MDT. PR before starting MDT was 70.6 /10,000 and PR by the end of December 1999 was 6.4/10,000.

#### Selected Problem Areas

1. Tribal areas
2. Remote areas
3. Vacant post of PMW since long
4. Poor transportation/communication facilities



5. Dense long-distance forests

6. Temporary immigrated population

Villages selected from tribal and remote areas and non-tribal areas of SET units and LCU. These villages are having poor transportation and communication facilities, posts lying vacant since long, long distance forest areas where it is not possible to do routine activities for individual leprosy workers. Case detection activity during the last three years is very poor as compared to the rest of the areas in the district.

### Co 150

#### ALTERNATE ACTIVE CASE DETECTION ACTIVITIES - AN EXPERIENCE IN GAYA DISTRICT, BIHAR

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MLEC II was conducted in Bihar state during March 2000. About 81000 new cases were detected during 6 days door to door active search by the General Health Staff. DFIT which has established District Support Teams in 24 districts of Bihar conducted an evaluation of MLEC during May and June 2000. This was done by random selection of one block in each district and examining all the suspects identified by the search team. In Gaya district of Bihar, Manipur block was selected for this purpose. There were 247 suspects identified by search teams of which 126 reported to the PHC for screening. 62 were confirmed as leprosy cases; (21 MB, 40 PB and 1 SSL) the remaining 121 suspects did not turn up for examination.

A. The support technical team during its evaluation examined all the 247 suspects and registered 37 new cases (14 MB, 22 PB & 1 SSL). During the screening of suspects, additional 69 cases were detected in the community (12 MB, 57 PB).

B. The team also conducted skin camps in 10 selected places in the block. The camps were done after intense propaganda by audio system fitted to the team's jeep, involving local general health staff. During the camps, 244 more suspects were identified of which 59 (17 MB, 39 PB & 3 SSL) turned out to be leprosy cases.

The total additional cases detected were 165 of which 106 cases were detected during examination of suspects and 59 by skin camps. The outcome of evaluation recalled that more than 250% of cases were not detected during MLEC. The total expenditure was Rs.3605/- about Rs.22 per case.

The future strategy for active case detection is to involve local General Health Staff and do block wise mini MLEC.

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### Co 170

#### CASE FINDING (LEPROSY) USING VILLAGE CHILDREN - BIHAR EXPERIENCE

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Intensive MDT programme with active survey changed to Leprosy Campaigns, etc. Innovative methods are being explored in leprosy control programme. Bihar State in India has been known for leprosy endemicity. Three LEC were done from 1996 to 2000. Post LEC quick campaign done in this region has yielded a large number of new cases of leprosy. The technical support team (Leprosy) in Purnea district, Bihar tried another innovative method.

Any new corner to a village is first greeted by the group of children. They are curious and anxious to participate. These children were educated on signs of leprosy using diagnostic cards. They went to their houses and examined their household members. Any one with suspected leprosy lesions were brought to the team for examinations. The support team could cover about 50 villages in 13 days and detected 135 new leprosy cases including 8 patients with lepra reaction. In addition to this, 94 absentees for treatment were also contacted. This seems to be another useful method for case detection in rural areas. Further details will be presented.

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### Co 232

#### UNAPPROACHABLE AREA MADE APPROACHABLE THROUGH SAPEL IN BILASPUR DISTRICT

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District Bilaspur is having 25 blocks out of which 8 blocks area is having dense forest and are unapproachable practically for 7 months in the year. The Health functionaries though posted to cover the area are either not residing in the HQS or they cannot move in their area due to hills and forest, so the services are poor. To come up from this situation and to render Leprosy Services SAPEL was proposed for Sectors in

3 Blocks. 136 new cases surfaced and got treatment during SAPEL period (from January 1999 to September 1999) using volunteers who were trained for one full day to suspect Leprosy Cases. Extensive I.E.C. activity resulted in voluntary reporting which is still continuing.

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### Co 325

#### SHORT-TERM IMPACT OF THE NATIONAL LEPROSY ELIMINATION CAMPAIGN (N-LEC) IN BANGLADESH

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A six-day National Leprosy Elimination Campaign (NLEC) was implemented country-wide in Bangladesh in February, 1999. The main objectives of NLEC were :

- a) Capacity building at all levels
- b) Creating nation-wide awareness on leprosy
- c) Detection of remaining hidden and backlog cases and provide them MDT

An immediate post NLEC survey was undertaken one month after NLEC implementation, to assess the short-term impact of the country-wide campaign. This was done through a sample survey conducted by six(6) teams of investigators, who collected data from 34 thanas (subdistricts) of eighteen (18) districts. The teams validated NLEC findings, investigated results and documented information with the aid of a prepared questionnaire. A total of 8 MDT centres, 56 leprosy patients, 195 health workers, 32 community volunteers and 2,200 members of the community were covered by the survey.

The salient features and findings of the survey and the short-term impact of NLEC are presented and discussed.

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### Co 29

#### PROBLEMS OF LEPROSY AMONG PEOPLE WHO MIGRATE TO OTHER STATES

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The Leprosy Mission, Champa in M.P. has been given an area of 1785 sq. kms. spread over two blocks in Bilaspur and one block in Raigarh District. Case detection, provision of MDT, care of deformity and other anti-leprosy activities are done by The Leprosy Mission in these three blocks.

About 5% of the population of the two blocks in Bilaspur District migrate during non-farming season every year to other states, especially to Punjab, U.P. and J.K. This migrant population mainly belongs to people below the poverty line.

The persons who develop leprosy among this group are always detected late and are prone to develop deformities.

This paper presents the practical problems faced to detect cases among this particular group of people and discuss ways to overcome late detection, deformities and irregularity in treatment.

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### Co 46

#### LEPROSY AMONG NOMADS AND ITINERANT GROUPS

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Nomads and Itinerant groups are sections of population who are normally not accounted for in any census. Leprosy surveys are likely to miss them. New leprosy cases occurring among them are generally brought to light by voluntary reporting. We submit two reports.

The first is a case of a nomadic group of about 800 individuals who were cloth sellers, who settled for a short time in the vicinity of our institution. A survey done using leprosy paramedical worker trainees resulted in the finding of 8 new cases, which is a fairly high figure for that population. With three of them being highly bacilliferous, we consider it significant in terms of potential transmission.

The second report is the case of an itinerant group of a large family hailing from Rajasthan, numbering about 35, two of whom reported with signs of leprosy. Upon examination of the whole family, it was discovered that 8 of them had leprosy, three of them with a high



BI. The importance of targeting such groups for surveys and health education campaigns cannot be overstated. The details of our findings will be presented and discussed.

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### Co 192

#### LEPROSY IN TAMIL NADU (INDIA) - A SPECIAL REFERENCE TO MDT REGIME

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Leprosy is caused by mycobacterium leprae. It is one of the chronic disease which causes much concern and remains as a challenging public health problem in India. Tamil Nadu is one of the states to witness a high prevalence rate of leprosy. MDT programme was introduced as a revised strategy replacing the dapsone monotherapy treatment to achieve quicker results in discharge of patients as cured and with the ultimate aim of eradication of leprosy. The study has identified the dimensions that have played a vital role in the health status of the leprosy affected population. It also shows the significance of MDT programme and its impact on the prevalence rate of leprosy in Tamil Nadu. Both primary and secondary data were collected from all districts in Tamil Nadu. The primary data was collected from 600 leprosy patients based on stratified random sampling procedure. Keeping in view the importance of MDT the present study analysed and identified the major dimensions of MDT with reference to Paucibacillary (PB) and Multibacillary leprosy (MB) on the basis of selected variables.

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### Co 209

#### MASSACRE OF M LEPRAE IN JAHANABAD, BIHAR

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Bihar state in India has mostly difficult areas for any field based health programme. Jehanabad is known for the problem of law & order situation. It is difficult to implement out-reach welfare programmes under such circumstances. National Leprosy Elimination Programme is no exception. There have been other problems like inadequate communication, etc. The support technical team coordinated the leprosy programme ac-

tivities. There has been active participation and support from programme managers.

Several training programmes on leprosy were done for various categories of general health services personnel and NLEP staff. The NLEP staff and general health care personnel with assistance from technical support team could bring about a positive change in leprosy scenario of the district. The two key elements of leprosy elimination programme, namely case detection and treatment delivery have been maintained at a satisfactory level. Details will be presented.

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### Co 235

#### LEPROSY SCENARIO IN MADHUBANI DISTRICT - THE POISE AND THE PERSPECTIVE

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Madhubani District, situated in north Bihar, India is moderately endemic to leprosy. The Damien Foundation India Trust has placed a support technical team in the district from February 1996. The team assists the local National Leprosy Eradication Programme staff in case detection, treatment delivery. The data available reflects significant improvement in the performance of the programme in the District. The new case detection rate has increased 3 fold in 97-98, 8 fold in 98-99 and over 3 fold in 99-2000. There is striking improvement in treatment compliance. Deformity rate among new cases has declined from 6.2% in 96-97 to 2% in 99-2000. 5000 absentees were traced through General Health Staff and community leaders and treated by the team in 97-98 though records were not available. However, the performance needs further improvement. Covering a population of 3.15 million with just 2 Non Medical Supervisors (NMS) and 29 Non Medical Assistants (NMA) is a pipe dream indeed. Three major rivers flowing through a major part of the district expose it to the fury of floods and inundation resulting in major operational constraints for four to five months in a year. Therefore, an alternate strategy is being planned. Making MDT services available through all PHCs, empowering general health staff to play an effective role in the program through capacity building and transfer of technology to extra medical personnel are the main contours of this approach. Special case detection drives through IEC and community participation is yet another priority area. A deviation from the conventional method is inescapable to hasten the process of elimination in this deprived district.

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### Co 236

#### PARTICIPATION OF A VEHICLE DRIVER IN LEPROSY ELIMINATION PROGRAMME

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Our organisation works in the 'A' ward of the Municipal Corporation of Greater Mumbai (MCGM) where there are head offices of several private and government undertakings but the residential area is low. We started our work in 1982 with a novel idea of leprosy exhibition on wheels. Our vehicle, with its exhibits on leprosy, gets parked at vantage points where passersby have a cursory look at our exhibits and at times, use the facility of spot examination by our trained workers inside the van. Since I am a person who has taken the complete course of PBDT successfully, I take an active part in explaining the various posters to lay people in a simple language, usually Hindi, which is understood by a majority of people coming to Bombay.

During the period from 1984 to 2000, approximately 28 leprosy patients were detected by me during such exhibitions of which 18 were from our project area and 10 were from outside our project area. Ten were MB +ve, eight were MB +ve and ten were PB. These were all from LIC. I built up a rapport with them and 23 completed the course of MDT, two patients left the area before completion of the course; they took only 6 pulses. Three are still completing their course of MDT.

I think every component of the leprosy elimination machinery such as a driver can take part in the elimination by giving health education, therapy, detecting leprosy and curing patients with regularity of Rx and preventing deformities.

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### Co 242

#### THE FACTORS AFFECTING 'LEPROSY THREE EARLYNESSES' AND ITS COUNTER MEASURES

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In the situation of the market economy and facing the basic elimination of leprosy, the implementation of early case - finding, early diagnosis and early treatment was affected by the factors of the misunderstanding the campaign of leprosy elimination, the imbalance between the social and economical benefit in the leprosy control, the lack of leprosy knowledge in the public and the deviations of the knowledge and ideology of leprosy workers. The authors suggested intensifying governments commitment and participation widely popularizing the leprosy health education, tightening up the organizations management and the construction of leprosy control contingents, and launching leprosy science research as well as implementing the strategy of science and education prosper leprosy work. It is appropriate measures to ensure the prosperity of leprosy control work in the future.

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### Co 249

#### PROCESS OF LEPROSY ELIMINATION IN AN ENDEMIC COUNTY

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Mengla situated in the southern tip of Yunnan Province, protruding into Laos, is a highly mountainous county, covering 7,093 sq. km with 195,000 population (1999). Mengla consists of 13 townships with 23 different ethnic groups, the majority being of Dai ethnic origin, leprosy control began in 1980, one year following the selection of the 3 leprosy settlements for therapeutic study of FMDT. During the period from 1980 till 1999 the case detection rate decreased from 52.5/10,000 to 1.0/10,000 and prevalence from

5.3/10,000 to 0.2/10,000. During the last 5 years, there is a continued decrease in detection and prevalence rates, P/D ratio = 2.0, 0% child rate and 100% voluntary reporting, but due to the few number of patients detected annually (mean 5.5, range 1-2), the MB and deformity rates fluctuate between 0 to 100%. During LEC campaigns, carried out in the two most endemic townships with 98.3% school children, 92% contact and

5.5% endemic village surveys did not detect any leprosy, inclusive 42 suspected single lesion leprosy. Although the above data meets the elimination criteria of WHO, further strenuous case detection activities inclusive continued health education to the public and training of primary health workers are required for the next 5 to 10 years.



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### Co 250

#### ANALYSIS OF NEWLY DETECTED LEPROSY CASES IN CHINA (1990-1998)

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The results of case-finding and the clinical characteristics of newly detected leprosy cases in China 1990-1998 are analyzed. All of the data came from the database of National System of Leprosy Surveillance, National Center for STD and Leprosy Control. The data were collected by local leprosy doctors and then sent to the Center for analysis. A total of 19453 new leprosy cases were detected during 1990-1998 with an average detection rate of 0.17/ 100000 (0.16-0.29/100000). In recent 5 years, the detection rate has been fluctuating within 0.14-0.16/100000.

However, there were 271 counties that had a detection rate of 0.5-2.2/100000 in China in 1998. The number of newly detected leprosy cases in Yunnan, Guizhou and Sichuan Provinces accounted for 53% of the total number of new cases in China. In this study, about

70.8% of all new cases had a definite history of contact with active leprosy cases. About 95% of all cases were detected by the skin clinics, self-report, clue survey and contacts surveillance. The number of cases with skin smear positive and BI>4.0 accounted for 62.9% and 11.4% in all new cases, respectively and about 11.1% of cases has only got a single skin lesion and 24% of cases has got disability of Grade II. Although the detection rate of leprosy in China has declined during 1990-1998, the leprosy problems in some areas should not be neglected. It is advisable to do case-finding actively combined with passive methods, so that leprosy cases can be early detected and treated and the disabilities can be reduced.

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### Co 300

#### A NOVEL APPROACH TO ABSENTEE RECALL IN CENTRAL REGION OF NEPAL

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Leprosy services are provided in an integrated manner in Nepal. Health workers receive minimal training and supervision. Often they encounter difficulty with the diagnosis of leprosy, and in convincing patients to complete a course of Multi-drug Therapy (MDT). The public's lack of confidence in local staff, may contribute to this absenteeism.

In three districts, in Nepal, with high prevalence rate and high defaulter rate, leprosy orientation was given to Village Health Workers and Community Health Volunteers, with emphasis on the importance of MDT completion. Immediately after the orientation course, these trainees visited absentees requesting them to re-attend their local clinic where they were re-examined by specialist leprosy staff, who could confirm the diagnosis of leprosy, offer any needed disability care, and counsel the patients. Supporting the local staff in this way resulted in a high number of absentees resuming treatment, and deduction from the register of misdiagnosed cases.

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### Co 414

#### EARLY EVIDENCE FOR FALL IN DISEASE TRANSMISSION IN LEPROSY

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Though it is difficult to imagine that the treatment of all cases of leprosy should reduce disease transmission, it is conceivable that good leprosy treatment programme along with extensive BCG coverage and improvement in socio-economic status may bring down disease transmission.

We examined data on new case detection for the past 15 years from an area where the leprosy control work has been consistently good. Sustained antileprosy work is expected to have an effect on annual new case detection rate, mean age at onset and proportion of MB among newly detected cases. Similarly, BCG vaccination and true reduction in disease transmission are expected to produce certain time trends in the above parameter. We examined the observed time trends in the context of the above theoretical constructs. There appears to be early evidence of true reduction in the rate of disease transmission in the study area.

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### Co 25

#### WHAT DO FIELD WORKERS FEEL ABOUT LEPROSY PROGRAMMES?

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Since the introduction of MDT in NLEP, Government guidelines have been issued time to time with the specific approach of reaching the national goal of Elimination of Leprosy within stipulated time period. Though the experts at higher level formulate policies for this, the success of programme is always in the hands of those who implement it, i.e. Field Workers.

In view of this, an attempt has been made to collect the views of Field Workers about the strategies presently used and their impact on reaching the elimination goal. A simple questionnaire consisting of five questions was distributed to 116 Field Workers who participated in the Regional Conferences of field workers, organized by H.K.N.S., Mah. Branch at Miraj and Panvel in March 2000.

Of 116 participants, 91(78%) responded voluntarily. The analysis of responses revealed that over 95% field workers were well aware about the statistical information about their district.

Majority of the Field Workers expressed that - i) it is possible to Eliminate Leprosy in their district (66%),

ii) single dose ROM is adequate for SSL patients (78%) and

iii) MDT for 12 months is enough even for Smear +ve MB cases (71%).

Further analysis of the responses and the views about their utility during post-elimination period will be presented and discussed.

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### Co 119

#### ROLE OF MEDICAL COLLEGE, GWALIOR IN LEPROSY ELIMINATION

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MDT programme in Gwalior district was started in a phased manner. It was implemented in one block from July 1992 and gradually by September 1993 the whole district was covered. Medical College Gwalior contributed in the following forms - Adopting area for MDT services - 19 wards and about 3 lacs population of urban area has been adopted for MDT services. One

NMS has been posted for case detection and drug distribution at 5 DDPs. Since last seven years, 377 new cases were registered, all cases were put on MDT and 185 cases were released from treatment.

Referral services - Leprosy patients are referred for confirmation of diagnosis and management of complications. These cases are seen in the department of skin VD.

Deputation of medical college staff to attend training in leprosy at SLTRI Karigiri. One Assistant Professor of PSM was deputed to attend training. Special studies (Health System Research) are conducted by department of Community Medicine (PSM) to analyze and solve the priority problems in leprosy elimination. Two studies have been completed and third one is being planned. Participation in National Campaigns - G.R. Medical College Gwalior participated in planning and conducting MLEC-1, MLEC- 2 and Polio Campaign (PPI).

Medical College provides trainers, lecture halls and AV aids for training the Medical Officers, Health Workers and Community Volunteers as and when required. Participation in planning, implementation and monitoring of MDT programme mainly urban area - The Dean/HOD - PSM are often invited by District Collector to participate in discussion regarding planning new, activities and progress.

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### Co 130

#### LEPROSY CONTROL AND ELIMINATION IN DELHI, INDIA

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Delhi is the capital city of India. Migration of population into the city for job opportunities is known to be a problem. Majority of them are from leprosy endemic states of Bihar and Uttar Pradesh. There are numerous settlements of people belonging to lower socioeconomic group. Infrastructure for National Leprosy Eradication Programme (NLEP) has been inadequate. Southwest district of Delhi with a population of 1.8 million is covered by the Damien Foundation & Lepa combined urban leprosy project. This project has a manpower of Medical Officer (1), Non Medical Supervisor (2), Non Medical Assistants (6) and a driver with vehicle. Different strategies are employed for case detection. During the past one year, 800 new leprosy patients are registered for treatment. Treatment regularity is more than 95%. Details of procedures for case de-



tection, treatment delivery and follow up will be presented.

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### Co 147

#### IMPACT OF INDUSTRIALISATION ON PROSPECTS OF LEPROSY ELIMINATION IN RURURBAN SECTORS

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District Raigad situated on western coast of Maharashtra (INDIA), is first among highly prevalent districts in the state for leprosy. It has observed 82% fall in Prevalence Rate (PR) in post MDT of 10 years. PRs in its Northern Blocks are much higher (8.71-12.6/10,000) than that of the District (7.71/10,000). These blocks, besides being adjacent to the Metrocity-Mumbai, are also identified as fast growing Industrial Zones. Hence, the retrospective study was undertaken to assess the effect of industrialization on Leprosy Elimination Programme in this region.

In this contest, the paper presents the data of Jaskhar SET Centre, of Uran Block which harbors major international business port JNPT and other major industries. The SET has noticed very slow fall in PR (63%) against a steep rise in New Case Detection Rate (NCDR) (106%), in last ten years. It is observed that the proportion of migrants among new cases is over one third in last five years, highest being 41% in 1999-2000. 56% of the cases detected in MLEC 1999-2000 in Voluntary Reporting Centers are migrants. MB patients constitute 35% among migrants (all being male & 89% adult) against 23% in denizens of the centre. 79% of migrant leprosy patients are labourers while 69% are staying temporarily. Regularity for treatment in this group is unexpectedly satisfactory. Other relative analysis is presented in the paper.

The authors discuss the prospects of leprosy elimination in rural areas, highly prone to industrialization and urbanization. However, authors, prima facie, conclude that the progress of leprosy elimination in the SET centre is brought to standstill because of industrialization of the region. They also caution that unless appropriate measures are not worked out, prospects of leprosy elimination in rururban sectors will be always under great threat.

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### Co 257

#### A DISCUSSION ON ADMINISTRATIVE INTERVENTION FOR 'LEPROSY 3 EARLYNESS ON CASE FINDING, DIAGNOSIS AND TREATMENT'

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In Jiangsu Province, the goal of basic elimination on leprosy has been realized and it is also passed the assessment by China Ministry of Health. However, from then on, some new problems have been emerging. For the new situation, the governments and communities at each levels should pay more attention to the new challenge. It is most important that professional organizations need to set up a new goal for leprosy control to consolidate the achievements achieved in the past. At present, leprosy control should be focused on three measures, which are early detection, early diagnosis & early treatment, to maximumly detect the new cases hidden by Campaign of Leprosy Elimination. So, we need to give more efforts to shorten 4 durations for leprosy control in future, namely the duration from patients having sense of suffering leprosy by themselves to them seeing doctor, the time from patients seeing doctor to doctor giving initial diagnosis, the duration from the patients being doubted for leprosy to them being diagnosed or removed as well as the time from patients being diagnosed to being given MDT.

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### Co 268

#### HOW TO LAUNCH LEPROSY CONTROL WORK IN THE HILLY AREAS

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Our county is located in the hilly area and leprosy is in a low endemic status. The local economy is not good to be compared with other counties located in plain areas. With the establishment of market economy in China, our institute insists on investing profit of 5-10% which from the income of skin disease and venereal clinics in leprosy work, allocating key members of health workers to carry out once or twice clue survey in the key townships annually, working out a policy of material reward for case report and training personnel in leprosy knowledge. In addition, we also utilize economic and non-economic means to divide the control tasks at county, town and village three levels and the tasks were incharged of by themselves. Through these comprehensive measures, the leprosy endemicity was effectively controlled and leprosy work has been stepped into a normal operation

track. All these efforts result in no new case to be detected in the past 10 years.

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### Co 269

#### THE ISSUE OF EARLY DISCOVERY OF LEPROSY IN SHANGHAI - ANALYSIS OF 47 PATIENTS DIAGNOSED IN THE 1990s

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By 1990, Shanghai had basically eliminated leprosy. However, 47 outpatients, 8 of whom were Shanghai natives and 39 of whom came from other parts of China, were found suffering from this disease from 1990 to 1999.

Among the 47 new cases, 29 (61.7%) were classes as multibacillary (MB), and 18 (38.3%) as paucibacillary (PB); the ratio of the two types was 1.6 to 1. The patients went to doctor 14 months after getting ill. Unfortunately, they received an accurate diagnosis 24 months later. These was an average delay of two years.

87.2% of them had had consultation with doctors at various hospitals before being diagnosed as having leprosy; some even did so several times. This showed that with the raising of cultural level, the improving of living conditions and the implementing of health education, people got used to seeking medical advice when they had a disease, and that the complete survey conducted at epidemic-stricken spots and due investigation were no longer critical methods of discovering patients.

The misdiagnosis rate of 85% indicated that it was important for doctors at all levels to remain vigilant against leprosy and to improve their diagnostic skills. In fact, it was not difficult to diagnose most of the cases, as 34 patients (72.3%) were found bacterium-positive. The diagnosis of MB leprosy, viewed as the source of infection, can usually be determined through looking for the bacterium. So, keeping alert to possible leprosy cases was even more crucial than the diagnostic level itself.

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### Co 328

#### FACTORS THAT CONTRIBUTED TO THE ACHIEVEMENT OF THE LEPROSY ELIMINATION GOAL IN BANGLADESH

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BANGLADESH has achieved the leprosy elimination goal as of December 1998, well ahead of the target date of December 2000. Thus, it does not figure in the list of Top Endemic countries published by World Health Organisation(WHO).

The success of Bangladesh in attaining the leprosy elimination goal can be ascribed to five (5) factors :

1. Integration of Leprosy Services into the General Health Services.
2. Model partnership with leprosy NGOs.
3. Collaboration with key groups like media, religious leaders, scouts and local community leaders.
4. Effective implementation of some focussed activities, such as Leprosy Elimination Campaigns (LECs).
5. Prevention of the factors of over-diagnosis & re-cycling of cases.

The paper will provide details pertaining to each of the five factors and their impact/contribution towards attaining the leprosy elimination goal.

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### Co 333

#### LEPROSY STATUS AND TRENDS IN THE WHO WESTERN PACIFIC REGION, 1999 AND A FRAMEWORK FOR COST EFFECTIVE POST ELIMINATION SURVEILLANCE SYSTEM

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As at the end of 1999, leprosy has been eliminated as a public health problem in 31 of 37 countries/ areas of the region, representing 99.7% of the population of WHO, Western Pacific Region.

There were 14,243 registered cases at the end of 1999 compared to 19,800 at the end of 1998. The prevalence rate decreased from 0.12 per 10,000 in 1998 to 0.09 in 1999, a decrease of 25%.

There were 9,495 new cases reported in 1999, with a new case detection rate of 0.57 per 100,000 population compared to 10,648 reported in 1998, with a detection rate of 0.64, a reduction of 11%.

The prevalence rate has declined continuously and



consistently since 1988 by 94% whereas the new case detection rate has remained stable with small variation between years. However, in 1998 there was a marked reduction of 23% compared to 1997 and a further decline of 11% was observed in 1999.

Efforts will be intensified in the few countries and areas that did not reach the elimination while targeting elimination at sub national level in large countries that already reached the elimination.

However, major challenge will be the design and implementation of a cost effective post elimination surveillance system, which may be based on the followings:

1. Establishing leprosy services in selected and designated referral centres, preferably dermatology services, to maintain expertise in diagnosis and case management;
2. Making leprosy a notifiable disease, integrated into the general disease surveillance and health information system;
3. Sustaining awareness on leprosy through yearly national campaigns to ensure community and general health workers participation in case finding and management;
4. Periodic evaluation.

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### Co 373

#### WHAT STRATEGY AGAINST LEPROSY?

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The tremendous impact of the elimination strategy (i.e. 10 million patients having been cured in one decade) fully justifies the existing strategy. Since we still lack a primary prevention tool however, it is fully justified to extend the elimination plan up to 2005.

In implementing the elimination strategy, technical problems are few and relatively easy to solve. But operational difficulties are many and tend to be more and more serious when elimination activities move to areas not yet covered, which is now generally the case. Of special importance are the problems related to adequate MDT coverage, integration of services, information and motivation of all groups concerned. WHO has developed various activities to help in solving these operational problems and is undertaking operational research projects that address other specific difficulties. Problems can be expected in relation to the decrease of political will of national authorities when the number of remaining patients has decreased sharply, or even in relation to humanitarian disasters. It could also be that, at global level, cooperation requires

strengthening between the various partners of the recently launched Global Alliance for Elimination of Leprosy.

On the whole, the impact of the elimination programme has been impressive so far, but the ongoing problems are tremendous. Even if the elimination target could be reached at national level in all endemic countries by 2005, there is serious doubt about the possibility of reaching elimination at sub-national level in several countries.

For these reasons there is an urgent need to stimulate vigorously both basic and applied research on leprosy. Subjects of prime importance are *M.leprae* infection and disease transmission, and the development of reliable test(s) for subclinical infection and incubation period. The sequencing of the *M.leprae* genome, now complete, opens promising avenues in many disciplines. The scientific community appears to be ready for this new beginning of leprosy research, but coordination of efforts requires streamlining to achieve maximum results without further delay.

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### Ep 13

#### ANALYSIS OF PERSONAL HYGIENIC HABITS OF MULTIBACILLARY HANSEN'S CASES WITH RELATION TO DEVELOPMENT OF NEW CASES IN COMMUNITY

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The disease is known since time immemorial to mankind. The disease and its consequences of visible deformity contributes for social stigma, which further leads to discrimination, disintegration of patients and families from society. The disease also affects directly or indirectly the productivity and economic growth.

The early detection, and case holding for prompt treatment is of paramount importance to uphold the Leprosy Elimination strategy. It is also observed that the operational researches and technical with academic researches on socio-cultural and habitat of community vis a vis suffering patients, so that the necessary precautionary measures can be taken and modalities can evolve for effective health education.

In the state of Maharashtra, the District Chandrapur was having high prevalence 139/10000 (1987) and now also 8.1/10000 (1999) compared to other Districts. The NCDR is also highest (10.6/10000) in state: which attracts the attention to analyse: the disease activity, its transmission and spread in community and its attributable factors.

The study conducted in 45 villages having 97 cases (M.B. and child) in 1,33,482 population. The 97 patients interrogated (interviewed) through pretested interview forms. Out of them Labourers (34), Farmers (25), Income group below Rs.500/pm (14), 500-1000 (51), Personal habitat Cigarette/Bidi smokers (24), Alcoholics (18) Pan and Tobacco chewers (64), Living/Sleeping in single room (49). Their contacts examined 27 and new cases detected 8. Spitting habit (indiscriminately) (56) out of which 7 new cases detected from contacts of 14 patients. Working together for 8 hrs/day (67) contact examined 28, from which new cases detected-3. Total contacts of 97 patients-281 out of which new cases detected(21) 8 M.B., 10 P.B., 3 S.S.L. i.e. NCDR (747.3/1000).

It suggests that the adverse socio-economic, socio-cultural and personal habitats had much more influence in spread of disease. Therefore a multiprong action is needed, including health education for effective implementation of Leprosy Elimination Strategy

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### Ep 32

#### **TREND IN LEPROSY IN PURULIA DISTRICT AND POST 2000 AD PRIORITIES Dr.Prasun Kumar Das**

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In West Bengal, the district of Purulia is one of the highly prevalent district. Purulia is one of the first two districts in India where MDT was started in the year 1982. However, the total patients of the district were brought under MDT in the year 1985.

The prevalence rate of leprosy was 40.55 in the year 1990-91 declined to 18.81 in the year 1999-2000 per ten thousand population. The deformity rate also has a decline from

3.3% in the year 1990-91 to 1.91% in the year 1999-2000. But the child rate has been increased to 21.41% in 1999-2000 from 18.8% in 1990-91.

In spite of the decline in the total case load, the New Case Detection Rate (NCDR) remains almost static for the last 10 years. The present study shows that the New Case Detection Rate was 20.88 in the year 1990-91, while it is found to be 25.06 in the year 1999-2000 per ten thousand population.

The above study indicates that still there are hidden cases in the community and also indicates the need to further epidemiological and laboratory experimentation to find out the other possible mode of transmission which are not yet established. It is suggested that an intensive and all out drive supporting all the components of leprosy work has to be undertaken to combat the situation.

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### Ep 58

#### **LEPROSY IN AGRA - SOME EPIDEMIOLOGICAL OBSERVATIONS FROM ONE YEAR FIELD WORK (1999-2000)**

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AIM : To find New Case Detection (NCDR) & Prevalence Rate (PR) in Rural/Urban Agra and also its correlates.

Methods : During July 99-June 2K, 64 villages and 26 urban units with each about 40 households have been surveyed by the team consisting Medical Doctor, Epidemiologist, Statistician and PMWs. A total of 13244 persons in rural and 3841 in urban have been examined. Details about individuals and household characteristics are recorded besides the clinical examination details. If a case is found, the person is given the required treatment.

Results : In rural areas, NCDR was observed to be 5.36/1000 and 3.12/1000 in urban areas. The prevalence was 6.12/1000 in rural and 3.91/1000 in urban respectively. Detail analysis suggests that more males are afflicted with the disease in rural and urban areas. This has also been found that households with poor sanitation facilities in and around the house has significantly higher prevalence of leprosy. Detail findings would be presented.

Conclusion : Agra has never been labeled as endemic for leprosy but the current data reveals its endemic nature with prevalence ranging ( 95% C.I.) from 45 to 67 per 10,000, thus requiring more attention of programme managers for case detection activities if its control is to be achieved.

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### Ep 181

#### **LEPROSY PROFILE IN A POPULATION OF 3,50,000 DURING THE LAST TWO DECADES - TEN YEARS BEFORE AND TEN YEARS AFTER MDT**

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The Leprosy Mission Hospital at Champa, Madhya Pradesh, was given an area in the year 1976 to carry out leprosy control activities. The present population



of the area is approximately 350000. This area lies in the Chhatisgarh region of Madhya Pradesh, the centrally located state of India. This area is endemic for leprosy. MDT was introduced much later in the area as late as in the year 1989. Therefore monotherapy was given to leprosy patients before 1989.

Statistics have been collected in the following categories to know the leprosy profile before and after the introduction of MDT. Statistics have been collected from the year 1981 to 1999 on:

- \* No. of new cases
- \* MB/PB ratio of new cases
- \* Deformity rate among new cases
- \* Child rate among new cases
- \* Prevalence rate
- \* New case detection rate
- \* Mode of detection

The statistics will be presented with discussions.

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### Ep 186

#### LEPROSY IN CHILDREN - A RETROSPECTIVE STUDY OF CHILD CASES DETECTED DURING THE LAST FIVE YEARS IN NORTH EASTERN SUBURBS OF GREATER MUMBAI

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Early detection of large number of child leprosy cases is one of the significant indicators of the continued presence of leprosy infection in a given geographical region. This study is based on the data of child leprosy cases detected over a five year period (1995 to 1999) at ALERT-INDIA's urban leprosy control projects in North Eastern suburbs of Mumbai.

The cases were studied from the epidemiological and clinical aspects as well. Case detection was initially done through school surveys and mass surveys. As high as 36% were child leprosy cases of the total 3,461 detected cases. Follow-up examination of the family contacts of these children revealed that sizeable number of them were members of multiple leprosy case families.

Critical analysis of the data confirms the persistence of the chain of transmission as a primary factor leading to the appearance of new cases in the community.

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### Ep 202

#### EPIDEMIOLOGICAL, SOCIAL AND CULTURAL DETERMINANTS OF LEPROSY IN ASIATIC ENVIRONMENTS

##### A STUDY WITH SPECIAL REFERENCE TO TREATMENT AND CONTROL IN INDIA

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Leprosy is one of the oldest diseases known to mankind since centuries. For centuries, since the disease is socially stigmatized, it becomes very difficult to reduce the prevalence, however the most sophisticated treatments are available. As leprosy is viewed as a major social and public health problem in Tamilnadu, the present study thus made an attempt to analyze the spatial and spatio-temporal variation of the disease in the last 10 years in order to understand the health status due to leprosy. As leprosy poses the double jeopardy not only the integration of the disease in the immunological and biological influences but also and perhaps more importantly, the cultural impact on the social status of the patients that results in the gender bias in health, beliefs, attitudes and behaviours. The study also made an attempt to explain the health status and situation in Asia as a result of leprosy and also to identify the major dimensions with reference to social stigmatization, particularly in Tamilnadu with the help of variables selected from cultural, social, behavioural, epidemiological and health care factors.

In addition, elucidating the emergence of gender bias within Indian culture thus provides a backdrop for understanding the specific problems experienced by the leprosy patients in Indian subcontinent. The study has also identified the spatial patterns of leprosy in Asiatic environments in relation to epidemiological background of the disease besides analyzing the sociocultural and socioeconomic dimensions drawn from the primary data survey conducted among leprosy patients of Tamilnadu. The data were analyzed with the help of multivariate statistical techniques to identify and group the spatial patterns and also attempted to model the cultural and behavioural factors responsible for prevention and control of the disease. The dimensions such as impact of MDT treatment, patients care history, treatment capacity, social ostracism and patients satisfaction, leprosy workers perception on the disease, etc. strongly suggested not only the leprosy situation in Asia but also throws light on the problems that are essentially to be addressed in future for prevention and control of the disease.

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### Ep 222

#### CHANGING SCENARIO OF LEPROSY IN MADHYA PRADESH

**K.K.Thassu, Mrs.Anshu Vaish & P.Prakash Bhopal**

Madhya Pradesh is the largest state in India. It caters to 8,18,89,412 population distributed in 61 districts. MDT was started in 2 districts during 1987, 11 more high prevalent districts, were covered with MDT during 1989-1992. Entire state was brought under MDT by September 1995. The prevalence rate of leprosy during 1987-1988 was more than 43.4 cases per 10,000 population. Gradually it has come down to 4.4 per 10,000 by March 2000. During these 13 years, 337990 new cases were detected and put on MDT, 4,33,707 cases were released from treatment.

Strategy of leprosy elimination in Madhya Pradesh includes MLEC, LEC, ULEC, RLEC, VRC, SAPEL, Skin Disease Diagnosis & Therapeutic Camp (SD-DTC), POD camps, Khel Khel Mai, Empowering Women to reduce gender inequality apart from traditional Survey Education Treatment (SET) done in routine.

The present (March 2000) situation of leprosy in Madhya Pradesh is as follow - Total registered cases - 35855 Prevalence rate - 4.4/10,000 New case detection rate - 5.5/10,000 MB case % - 46% Disability grade II among new cases - 4.7%

Child cases among new cases - 11% No. of districts having PR. more than 10 per 10,000 - 3 No. of districts having PR. more than 5 per 10,000 - 18 No. of districts having PR. more than 2 per 10,000 - 22 No. of districts having PR. more than 1 per 10,000 - 14 No. of districts having PR. less than 1 per 10,000 - 4

Now the NLEP has been integrated with the GHC system (w.e.f. July 2000) and leprosy elimination is being attempted through community education & involvement.

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DESIGN : Observation study THE LEPROSY MISSION, NUAPADA.

SETTING : District of Nuapada, Orissa

PARTICIPANTS : Recorded Leprosy cases from Jan. 1997 to 2000 June.

MAIN OUTCOME MEASURES :

1. Cumulative case detection rate
2. Deformity rate
3. Smear (B.I) positivity rate.

RESULTS :

1. A. Schedule Caste people cumulative case detection rate - 204.9
- B. Non-Schedule caste people cumulative case detection rate - 76.6
2. A. Schedule Caste patients deformity rate - 9.5
- B. Non-Schedule Caste patients deformity rate - 8.4
3. A. Schedule Caste patients Smear (BI) positivity rate - 6.5
- B. Non-Schedule Caste patient Smear (BI) positivity rate - 5.2

Continued on next page CONCLUSION:

1. Schedule Caste people showing high rate in cumulative case detection in comparison to Non-Schedule Caste people.
2. Schedule Caste patients showing high rate in deformity in comparison to Non-Schedule Caste patients.
3. Schedule Caste patients showing high rate in smear (B.I.) positivity, when compared with Non-Schedule Caste patients.

It is possible that the observed difference are due to differences in Socio-economic status, such as poverty, education and hygiene.

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### Ep 238

#### COMPARING LEPROSY INDICATORS BETWEEN SCHEDULE CASTE AND NON-SCHEDULE CASTE PEOPLE

**R.Zachariah & Dr.Sanjeva Rao** The Leprosy Mission, Khariar, Orissa

OBJECTIVE : To compare difference between the cumulative case detection rate, Deformity rate and Smear (B.I) positivity rate between Schedule Caste and Non-Schedule Caste People.

### Ep 336

#### SOME QUESTIONS OF EPIDEMIOLOGY AND FIGHTING AGAINST LEPROSY IN TURKMENISTAN

**CDWG A.A.Gowshudow & KKB T M I A.M.Izmailow**, Turkmenistan

The systematic control for leprosy foci in Turkmenistan, hospitalization and treatment of both newly revealed patients with clinical bacterioscopic relapses, especially the application of the combined chemiother-



apy (CC) with antileprosy preparations (rifampicin, clofazimine, ofloxacin, minocycline and others) with accounting of multibacillary and little bacillary leprosy substantially influenced on the morbidity structure change and the populations leprosy affection.

On June 1, 2000 there were 120 leprosy patients registered at the dispensary accounting that more than by 2 times was less compared with 1964. Male patients were 62.5%, female patients were 37.5%. These indices did not experience substantial changes. The sufficient reduction of the patients number in Balkansky region (17.5% vs 42.3% in 1964) and considerable increase in Dashoguzky region (70% vs 41.8% 1964) happened. This explained by more late extensive antileprosy work.

If in 1964 the most morbidity was noted at the age under 30 years, according to our data it was noted under 40-60 years (56.6%). The displacement of the leprosy morbidity to more late terms of the human life points of the decrease of the affection and morbidity risk.

According to the diagnosis the patients were distributed in the following way : LL lepromatous type-39%, BL-border-lepromatous type -7.5%, TT tuberculoid type -29%, BT border-tuberculoid type-11.6%, BR border type - 12.5%.

The comparative analysis of these indices with the data if 1964 shows the considerable increase of patients with little bacillary morbidity types (tuberculoid and border) and the number reduction of patients with lepromatous type.

The noted shifts in the morbidity structure create the more favourable epidemiologic situation in the infection transmission.

### Ep 386

#### LEPROSY IN CHINA : EPIDEMIOLOGICAL TRENDS BETWEEN 1949 AND 1998 Dr.Xiang-sheng Chen, Nanjing, China

Based upon the database from the National System of Leprosy Surveillance, the epidemiological trends of leprosy for 50 years (1949-1998) in China are analysed in this paper. During the study period, a total of 474,774 leprosy patients had been detected.

The case detection rates per 100,000 population were highest in the 1950s and 1960s, and the peaks observed in the curve of case detection appear in 1957-58, 1963-66, 1969-70, and 1983-84, which correspond to the mass surveys or screening surveys in most areas or selected areas of the country. The duration of the disease at the time of detection has been shortened over the years, and disability rate was as high as more than 50% in the early 1950s and decreased gradually to 20.8% in 1997-1998, but it is still far too high. More than 50% of cases were found through active methods in 1955-58, 1965-66, and 1969-1976, but these meth-

ods are not the predominate ways to detect cases at the present. The peak prevalence was found in the 1960s remaining at more than 2 per 10,000 population and decreased annually from the 1970s onwards. By the end of 1998, the prevalence had decreased to 0.05 per 10,000 population.

The study reveals that leprosy has been well controlled in China and the WHO elimination of leprosy as a public health problem has been achieved totally at the national or sub-national level. But leprosy is still distributed unevenly in the country. According to the China criteria of leprosy elimination defined as prevalence rate of less than 1/100,000 in terms of county/city, there were still more than 10% of counties/cities where the criteria have not been achieved. The special attention for reaching the elimination and final eradication of leprosy should be emphasized in future.

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### Ep 47

#### HUMAN IMMUNODEFICIENCY VIRUS INFECTION IN PATIENTS WITH LEPROSY - A MULTI-CENTRE STUDY

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While the relationship between leprosy and HIV seropositivity and/or AIDS is still unclear, such a relationship between other mycobacterial infections like tuberculosis and MAI disease and AIDS has been well documented, the former causing significant morbidity and mortality. In a study involving five leprosy hospitals of The Leprosy Mission India situated in the eastern part of India, we screened 2000 leprosy patients, 400 from each hospital as part of phase-I of our study. Half of the patients were from the leprosy control area and half from the OPD clinics. Patients were inducted irrespective of sex, leprosy type, duration of disease or treatment or absence or presence of complications. The sample age group was 16-50 years. Only two patients were found to be HIV positive confirmed by Western Blot, both from our Calcutta hospital, indicating that the problem of HIV in leprosy may be mainly urban and not significant.

In the second phase of our study, 469 patients from Calcutta and another 574 leprosy patients from our hospital at Miraj in Western India were screened. In this phase 18 patients were confirmed for HIV positivity (16 from Miraj and 2 from Calcutta). Only one progressed to full-blown AIDS. This ongoing second phase involves study of the clinical course of leprosy in patients who are seropositive for HIV. Clinical observations as seen now will be reported and discussed.

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### Ep 70

#### HOUSE HOLD CONTACTS OF LEPROSY AND ITS IMPACT ON CHILDHOOD LEPROSY

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A retrospective case note study was done of children who attended Dhoolpet Leprosy Research Centre (DLRC) over the past decade (1990-99). The focus of the study was to detect the incidence of family contact among these children and also to define the profile of clinical presentation and to describe the evolution of the disease in the cases who were on regular follow up.

A total of 306 children (below the age of 14 years) with leprosy attended DLRC over the past ten years. Of them 182 (60%) were male and 124 (40%) were female. The youngest case detected was 9 months old. History of contact was present in 119(38.8%) cases of which, family contact 113 (95%) & other than family 06 (5%). Among the contacts of the index case 21 (35%) suffered from PB leprosy and 39 (65%) from MB leprosy. The classification of the contact was available in only 60 patients. All contacts were from the immediate family.

The spectrum of leprosy detected in these children was as follows: TT-62 (20.3%), BT-203-(66.3%); BB-03 (1%); BL-23 (7.5%); LL-5 (1.6%) and PNL -10 (3.3%).

29 (9.4%) cases were smear positive and 277 (90.6%) were smear negative. 95 children had a single patch, 159 had fewer than 5 patches and 37 had multiple patches. 91 (29.7%) children went into reaction - 5 Type II and 86 Type I.

Conclusion: These data show that childhood leprosy cases continue to present to out-patient clinics. There is a high level of family contact with leprosy in these cases.

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### Ep 89

#### CASE DETECTION AMONG NON-HOUSEHOLD CONTACTS OF NEW SMEAR POSITIVE MB CASES

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Household contacts of smear positive MB cases are generally considered as high-risk population and hence covered in routine case detection activity. However, leprosy cases like other people also spend much more time outside their homes, thereby having contact with people residing in surrounding houses, at the place of work and at the place of social activities.

In taluka Panvel, 7946 people have been identified for having contact with 46 new smear positive MB cases by virtue of their staying in the surrounding houses (4612 people), working with the index cases (1548 people) and having social contact with the index cases (1786 people). Of these 7324(92%) had been examined to reveal 27 new cases (4 SSL, 16 PB and 7 MB).

The New Case Detection Rate (NCDR), observed among extra-household contacts of smear positive MB cases (37/10000) was found to be much higher than that is seen in routine surveys. Among three categories of non-household contacts, the maximum NCDR of 66 cases per 10000 population was observed among the people having social contacts with smear positive MB cases.

The results suggest that the non-household contacts of smear positive MB cases should also be considered as high-risk population.

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### Ep 121

#### INCIDENCE OF LEPROSY IN FEMALE IS EQUAL TO MALE - REVEALED IN MLEC II

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##### Instructions

It has been told and written in many text books that incidence of leprosy in male is two times more than female because female community in India is less exposed to infection than male community.

But outcome of II MLEC in Orissa has proved this fact and hypothesis wrong.

II MLEC in Orissa yielded 13218 number of female cases out of 13574225 female population examined



with detection rate 9.74/10,000. 13979 number of male cases were detected from 14141763 male population examined with detection rate 9.88/10,000. So it proves that incidence of leprosy in both the sexes is equal. This could happen due to involvement of more number of female volunteers in search activities of MLEC-II.

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### Ep 165

#### IMPACT OF PRIOR BCG VACCINATION ON THE EFFICACY OF VARIOUS VACCINES AGAINST LEPROSY

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**Introduction :** The efficacy of BCG vaccination against tuberculosis and leprosy has been investigated by many investigators. BCG vaccination has been included in the universal immunization schedule. Hence, in future, when most of the population would have had BCG vaccination in childhood, studies of any other vaccination has to be carried out in the backdrop of prior BCG vaccination.

**Objective :** To study the impact of prior BCG vaccination as judged by the presence of BCG scar, on the preventive efficacy of four different vaccines against leprosy.

**Methods :** A controlled, double-blind, randomized, prophylactic leprosy vaccine trial was conducted in south India. Four vaccines, namely, BCG, BCG + Killed M.leprae, Mw and ICRC were studied in the trial in comparison with normal saline placebo. Analysis is done based on 1,13,500 subjects concurrently vaccinated by all the five arms of the study. Due to death and immigration, there was a decrease in the cohort by about 5% per annum. In the two resurveys, the coverage for examination was more than 90%. Stratified analysis, adjusting for covariates was employed.

**Results :** There was no significant impact of earlier BCG vaccination against leprosy as seen from incidence cases in the subjects in the placebo arms of the two resurveys. The absolute level of protection offered by these vaccines is more among subjects with prior BCG vaccination, though not statistically significant.

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### Ep 178

#### EFFECTIVENESS OF BACILLUS CALMETTE GUERIN (BCG) VACCINATION IN THE PREVENTION OF LEPROSY : A CASE CONTROL STUDY IN RAIPUR - A PRELIMINARY REPORT

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**Objective :** To estimate the effectiveness of BCG vaccination in the prevention of leprosy. Literature is sparse on the role of BCG in prevention of leprosy in Indian population despite the fact that more than a half of the world's leprosy cases are in India.

**Design :** Population-based pair-matched case control study.

**Setting :** Rural community, Raipur, Madhya Pradesh.

**Participants :** The study included 142 cases of leprosy (diagnosed by WHO criteria), below the age of 35 years registered during 1st January 1999 to 31st March. Each case was paired matched with one neighborhood control for age, sex and socioeconomic status. Exclusion criteria for controls included past or current history of tuberculosis or leprosy.

**Main Outcome Measure(s) :** BCG effectiveness.

**Study Factor :** BCG vaccination status was assessed by examination for the presence of BCG scar, immunization records if available and information from subjects/parents of children. Subjects uncertain about BCG vaccination were not included.

**Results :** A non-significant protective association between BCG vaccination and leprosy was observed (OR= 0.65, CI 0.36-1.17). The overall vaccine effectiveness (VE) was 34.48% (95% CI -17-64). The BCG effectiveness against multibacillary and paucibacillary leprosy was 42.86% (95% CI -95-83.28) and 31.82% (95% CI -31-64.64) respectively. The overall prevented fraction was 17.68% (95% CI -06.31-42.05).

**Conclusion :** The current population-based case control study performed in Central India (Raipur), identified although a non-significant but a beneficial role of BCG vaccination in prevention of leprosy in study population.

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### Ep 228

#### PATTERNS OF HOUSEHOLD AND NON-HOUSEHOLD CONTACTS IN TWO 5-YEAR COHORTS AND ITS RELEVANCE TO TRANSMISSION OF LEPROSY

**Mehar Vani, Venkat Ram Reddy, Muzaffarullah, Suman Jain, Lavanya Suneetha & Sujai Suneetha**

Lepira India, Hyderabad

Dhoolpet Leprosy Research Centre is an out patient clinic where patients are self-drawn or referred for diagnosis and treatment of leprosy. In this retrospective study, we analyzed the pattern of contacts of patients seen at the Centre. Contacts were categorized into immediate household, extended family/relatives and other social contacts. The other variables considered were age, sex, type of leprosy and duration of onset. Conjugal spread, disease among siblings and parent to child transmission were also analyzed. The direction of probable infection was studied in relation to the index case.

2380 patients registered between 1982 & 1986 and 2155 patients between 1990 & 1994 were questioned on the history of contact with leprosy. Results reveal that overall, 617 out of 4535 patients (13.6%) gave a history of contact; 366 out of 2380 (15.4%) in the 1980s cohort study and 251 out of 2155 (11.6%) in the 1990s cohort. As in previous studies, household/familial contacts were the most frequent (83.1%), followed by relatives (7.5%) and least from social contacts (3.2%). Among household contacts, the most frequent contact was with parents (40%), followed by contact among siblings (30.2%), and then conjugal contact (13.5%). There was a higher proportion of multibacillary leprosy patients among the contacts and the disease type produced in the index case was more commonly paucibacillary leprosy. Details of comparison of the variables between the 1980 and the 1990 cohort will be discussed.

In conclusion, the study substantiates the significant impact of the immediate family and the multibacillary case in transmission of disease. Differentiation based on blood relationship suggests a familial pattern with a genetic basis in a proportion of contacts.

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### Ep 343

#### SEROLOGY AND PCR AS APPLIED TO THE EPIDEMIOLOGY AND PREVENTION OF LEPROSY

**Dr.S.Izumi, Dr.T.Budiawan, Dr.K.Saeki, Dr.M.Matsuoka & M.Hatta**

Kagawa, Japan

Since the early 1990s, our research group has been conducting a series of epidemiological studies of leprosy in endemic pockets of Indonesia, the purpose of

which was to attempt to explain why leprosy is so endemic in the area and to collect epidemiological data that will be useful both for the global elimination of leprosy and for preventing the disease.

Indonesia is third highest on the list of the most leprosy-endemic countries in the world. According to the / Government of Indonesia, the number of registered cases in 1999 was 21,027 with the prevalence of 1.01 per 10,000 population. During the period from April 1998 to March 1999, 16,448 cases were detected. The case detection rate is more or less stable.

Leprosy is heterogeneously distributed in the country; North Maluku and South Sulawesi are the endemic provinces. We began a cohort study in the provinces in 1991, and have since conducted a series of epidemiologic surveys, employing both serological and nose-swab-PCR techniques. As the results of a series of epidemiological study, we found the following:

1) a considerable proportion of the healthy residents of the hot spot, who are not household contacts of leprosy patients, appears to be infected with *M. leprae*; 2) *M. leprae* appear to be ubiquitous in the environment of the hot spot, and it appears reasonable to assume these environmental organisms play an important role in the infection; 3) development of new immunological tools that may be used to predict who among those at risk will develop clinical disease is one of the most important subjects of research in the future; 4) chemoprophylaxis delivered to those at high risk of developing overt disease is essential for the control of leprosy in the hot spot.

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### Ep 371

#### DO WE UNDERSTAND THE FUTURE? LESSONS FROM THE LEPROSY SIMULATION MODEL SIMLEP

**A.Meima, W.C.S.Smith, J.H.Richardus, G.J.van Oortmarssen & J.D.F.Habbema** Erasmus University Rotterdam, The Netherlands

In many endemic countries, new case detection has not shown a downward trend in the 1990s. Operational factors, such as the leprosy elimination campaigns that were conducted in the late 1990s are partly, but to an unknown extent, responsible for this. Moreover, it is unknown how the incidence which underlies new case detection is evolving. It is therefore unclear what will happen to the leprosy problem after the year 2000.

Uncertain aspects of leprosy epidemiology govern trends in leprosy incidence. Can everyone get leprosy? How easily is leprosy transmitted? Who is responsible



for transmission? How late are new patients detected? Do other factors than leprosy control contribute to trends in leprosy incidence? This paper explores some of the uncertainties that govern past and future trends in leprosy by applying the leprosy simulation model SIMLEP using different sets of assumptions. The observed new case detection trend in major endemic countries is mimicked from 1985 onwards, and future leprosy incidence and new case detection are projected.

Preliminary simulations show that future trends and the impact of leprosy control on these trends strongly depend on assumptions about uncertain aspects of leprosy epidemiology. It can not be excluded that leprosy incidence will decline only slowly in the near future. The epidemiological uncertainties about leprosy should be accounted for in making future policy decisions in leprosy control. Continued careful monitoring of areas with good quality MDT treatment registries may partially resolve these uncertainties.

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## Ep 372

### DISAPPEARANCE OF LEPROSY FROM NORWAY : ANALYSIS WITH THE LEPROSY SIMULATION MODEL SIMLEP

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SIMLEP is a computer simulation program for modelling the transmission and control of leprosy which can be used to predict epidemiological trends. In the present validation study, SIMLEP is shown to reproduce the declining incidence of leprosy in Norway between 1856 and 1920 well.

In order to fit the Norway data, an autonomous declining trend in infection risks, reflecting improvement in for instance living conditions, had to be assumed. The autonomous trend and hospitalisation of patients, used at that time as preventive control measure, each explained roughly half of the decline. The decline in Norway coincided with a relative increase in incidence rates at older ages which was reproduced well by assuming that 10% of new cases had very long incubation periods. Another good fit of the data was obtained under the assumption that most infections take place in the first part of the contagious period. The assumption that incubating cases are contagious resulted in a third good fit. Autonomous trends have to be stronger for the second and third model because their assumptions reduce the effectivity of hospitalisation.

The fact that different assumptions can explain the Norwegian data about equally well, reflects the lack of a diagnostic test for leprosy infection and our lack of knowledge on the transmission dynamics of leprosy. It is of concern to today's leprosy control that the three model variants lead to different predictions about the impact of control strategies. Further, validation efforts on complete, longitudinal data from different control programmes in the dapsone and MDT eras can lead to reduction of the uncertainty about the key transmission parameters involved in leprosy.

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## CI 114

### CLAW HAND IN A CASE OF TT LEPROSY DEVELOPING AFTER 1.5 YEARS M.D.T.

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This case report is being presented to highlight the following points:

- i) There is a need to re-examine the efficacy of Fixed and Short Duration M.D.T. in leprosy.
- ii) There is a need for regular follow up of patients with timely intervention to prevent new paralysis, during and after M.D.T.
- iii) There is a need to be aware that some leprosy patients, as in this case, prefer to go to another doctor when their symptoms do not improve, and M.D.T. is stopped as per W.H.O. and N.L.E. P. guidelines.

#### Case Report

A 23-year old male clerk from Bihar, who is working in Punjab, developed an area of sensory loss on the right wrist 3 1/2 years before reporting. The patient was diagnosed outside as a case of leprosy, after a biopsy, and he was given Cap. Rifampicin 600 mg on two days a month and

D.D.S. 100 mg od for 1 years, after which his treatment was stopped. Two months after stopping treatment the patient noticed an erythematous raised anaesthetic lesion on the site of previous sensory loss on the Rt wrist. The patient returned to his doctor but was not given any further anti-leprosy treatment. Two weeks later he developed a right claw hand, but unfortunately did not return to his doctor, as he lost confidence. The patient was subsequently referred to our hospital during a skin camp in the locality.

On examination, there was a hypopigmented, and erythematous, anaesthetic lesion present on the dorsum of

right wrist and hand. Part of the lesion had a finely-pebbled margin. There was a right claw hand, and the right ulnar nerve was grossly thickened and slightly tender.

Continued on next page Investigations and treatment : A skin biopsy was performed, and the patient was started on

M.D.T., with daily Rifampicin, Clofazimine 100 mg BD, DDS 100 mg od, and Tab. Prednisolone 40 mg/day.

Discussion: It is probable that this patient's claw hand deformity might have been avoided because he had been given timely M.D.T. plus oral prednisolone after the occurrence of his anaesthetic plaque (? Reversal reaction), after more than 1 1/2 years of supposed overtreatment with M.D.T.

This case also emphasizes the need for a close rapport and confidence between the leprosy patient and his doctor. It might be better in some or many cases to tailor the anti-leprosy treatment according to the individual patient's requirements, rather than according to a fixed and rigid schedule.

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### CI 115

#### A CASE OF TUBERCULOID LEPROSY RESEMBLING LUPUS VULGARIS

*Dr.M.Z.Mani, Dr.Emy Alexander & Dr.Sunitha Jacob*  
C.M.C. & Hospital, Ludhiana

A 40-year-old housewife presented with an asymptomatic plaque on the left flank for one year. The plaque had ulcerated, with sero-sanguinous discharge, four months before her visit. She also developed an asymptomatic papule on the left forearm.

On examination, there was a well-defined plaque 7 cm x 3.5 cm situated on the left flank. The plaque had a greyish-black margin, an adherent- necrotic crust, and a superficially ulcerated centre. There was also a small, reddish-brown soft nodule present on the left forearm. The peripheral nerves were not thickened, and there was no sensory or motor loss of the hands and feet.

Investigations: The Mantoux test was negative and the chest X-ray was normal. The skin smears were negative for lepra bacilli. The skin biopsy from the plaque and nodule showed well-defined, compact granulomas suggestive of tubercuoid leprosy, lupus vulgaris or sarcoidosis. Points in favour of leprosy were periapendageal and perineural involvement. The biopsy from the plaque showed one suggestive totally destroyed nerve with only a few recognizable Schwann cell nuclei.

On the patient's revisit after antibiotic therapy, the plaque had dried, and there was more appreciable sensory loss, but still not complete loss. The patient was diagnosed as a case of Tuberculoid Leprosy (BT/TT), and advised M.D.T.

Discussion: This case is being presented to emphasise the importance of expert clinico-pathological correlation and histopathology, especially with regard to nerve infiltration, in diagnosing atypical cases of TT and BT leprosy.

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### CI 124

#### UNUSUAL PRESENTATION OF LEPROSY

*Dr.B.B.Munde, Parbhani*

No age is immune to the disease leprosy. Generally, leprosy cases are found in early childhood. During routine survey of leprosy cases, a four year child was detected in sector Gangakhed Leprosy Control Unit, Parbhani District. Patches were present since one year. Considering deficiency patches, the child was treated with anti-helmenthic drugs, vitamins and iron, but there was no response. Lastly, the patient was diagnosed as a multi-bacillary case of leprosy and anti-leprosy treatment was started (multi-bacillary regimen). The patient responded to treatment and dramatically, the patches started regressing after the completion of the fourth dose. After completing ten doses, many of the patches disappeared.

Conclusion: Child case with patches may be a leprosy case unless and until it is proved otherwise.

Dr.B.B.Munde, Assistant Director Of Health Services (Leprosy), Parbhani

### CI 156

#### NAIL INVOLVEMENT IN LEPROSY

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INTRODUCTION : Leprosy is a multi system disease with wide ranging manifestations. All organs and systems are involved and have been studied quite extensively. Although dystrophic changes and mutilation of hands and feet are considered more or less a part of the symptomatology of the disease, nail changes have received only a passing reference in literature.

MATERIALS & METHODS : Two hundred patients of leprosy, mostly belonging to the poor socio-economic class, in the age range of 20-40 years, hundred



each from the paucibacillary (PB) and multibacillary (MB) group, irrespective of treatment and reactional status were studied. Fifty age and sex matched control subjects from the normal population who were not suffering from any disease known to affect the nails and 32 treated patients of leprosy residing in a nearby leprosy colony were also taken up for the study.

**RESULTS :** Nail changes which occurred with similar frequency in the PB and MB groups on comparison with the control group were excluded from the analysis. Out of a total number of 100 PB patients, 57 (57%) showed nail changes. Forty (40%) patients showed changes in the finger nails, with an involvement of average of 3.9 nails per patient. Thirty eight (38%) patients showed changes in the toe nails, with an average of 3.6 nails per patient. The commonest change observed was longitudinal melanonychia (34.4%) in the finger nails and longitudinal ridging (46.7%) in the toe nails. Out of a total of 100 MB patients, 93 (93%) showed nail changes. Seventy-two (72%) patients showed finger-nail changes, with involvement of an average of 5.7 nails per patient. Eighty-four (84%) patients showed changes in the toe nails, with an average of 6.2 nails per patient. The commonest nail change observed was longitudinal melanonychia (14.8%) in the finger nails and subungual hyperkeratosis (25.3%) in the toe nails.

Out of a total of 32 colony patients, 31 (96.9%) showed nail changes. Thirty one (96.9%) patients showed finger nail changes with an average of 7.9 affected nails per patient. Thirty one (96.9%) patients showed toe nail changes with an average of 8.4 nails per patient. The commonest nail change observed was rudimentary finger (29%) and toe (21.1%) nails.

**CONCLUSIONS :** Nail changes are common in leprosy, more so in the MB spectrum. Several changes have been found in impressive numbers but whether all are specific for the disease will remain speculative unless a clinico-pathological study correlates our observations.

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## CI 157

### INVOLVEMENT OF MALE GENITALIA IN LEPROSY

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**INTRODUCTION :** Although involvement of the male genitalia particularly of the gonads is well known in leprosy, lesions of leprosy are not commonly found

on the genital skin probably due to difficulty in locating them by examination in routine clinical setups.

**MATERIALS & METHODS :** From March 19 to July 1999, we screened 467 male patients attending our leprosy clinic for genital involvement. **RESULTS:** Genital lesions were observed in 6.6% of all male cases of leprosy. They were seen most frequently in lepromatous leprosy (25.8%), followed by borderline lepromatous (13.3%) and borderline tuberculoid (1.4%) leprosy. There were 293 (62.7%) patients with borderline tuberculoid (BT) disease, 143 (30.6%) had borderline lepromatous (BL) and 31 (6.6%) had lepromatous (LL) disease. Out of 467 patients only 31 (6.6%) had lesions on the scrotum or penis either alone or on both the sites. Lesions on external genitalia were present in 4 out of 293 (1.4%) patients with borderline tuberculoid (BT), 19 out of 143 (13.3%) patients with borderline lepromatous (BL) and 8 out of 31 (25.8%) patients with lepromatous (LL) disease. Mean age of the affected men was 31+ 8.5 years and the mean duration of disease was 6.0 ± 2.8 years. Seven patients were in reaction (BT-2, BL-3, LL-2). Five patients (BT-2, BL-3) had Type 1 reaction and two patients with LL disease had Type 2 reaction.

**CONCLUSIONS :** The incidence of 6.6% for genital lesions in our study indicates that such lesions are not as uncommon as reported before. They are however, likely to be missed if not looked for carefully. Their recognition becomes important because genital lesions produced by other diseases may require more serious attention than mere identification.

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## CI 205

### RARE NEUROLOGICAL CONDITIONS MASQUERADING AS LEPROSY

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Pure neurotic leprosy mimics a number of neurological conditions. Careful and meticulous clinical, especially, neurological examination along with detailed investigations is often necessary to arrive at the correct diagnosis. All this is especially necessary in this consumer conscious era, where one can land into unnecessary legal complications resulting from giving MDT to non-leprosy cases.

We present a unique study of five cases (2 syringomyelia, 3 HSN-I). All of whom were misdiagnosed as leprosy initially with some even receiving Anti-Hansen's therapy prior to our evaluation.

Our aim of presentation is to highlight upon the neurological features that helped us to distinguish these cases from leprosy.

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### CI 231

#### LEPROMATOUS LEPROSY MASQUERADING AS CERVICAL LYMPHADENITIS

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Leprosy can manifest in many unusual ways and the diagnosis in such situations can be missed. We describe a patient who had a single nerve involvement in the neck which manifested as a swelling and was misdiagnosed as cervical lymphadenitis by the internists. A 25-year-old electrician had a 2-years history of gradually progressive asymptomatic swelling on the left side of the neck. There was no history of any skin lesion associated with the swelling or elsewhere on the body. The patient was initially seen in the out patient department of medicine where a diagnosis of tubercular cervical lymphadenitis was considered. A fine needle aspiration cytology, repeated twice, revealed ill-defined granulomatous infiltrate with numerous acid fast bacilli. Examination revealed an ill-defined, firm, mildly tender swelling of 3 x 2 cm. with uneven surface on the left side of the neck which was a thickened left greater auricular nerve. There was a faintly erythematous 5 x 2 cm. macule with minimal atrophy on the pinna of the left ear extending on to the left cheek. The lesion had 50% sensory loss to temperature while the sensations to pain and touch were unaltered. The supra-orbital nerve on the left side was also thickened. Examination of the eyes revealed partial lid lag of the left eye. Nerve biopsy revealed ill-defined granulomas consisting of epithelioid cells with numerous lymphocytes and histiocytes. Ziehl Neelsen's stain for acid fast bacilli was strongly positive with BI of 5+. Skin biopsy from the pinna of the ear showed atrophy of the epidermis and a grenz zone with focal perivascular and periappendigeal lymphohistiocytic infiltrate in the dermis. A diagnosis of lepromatous leprosy was made and the patient was treated with multi-drug therapy as recommended by WHO for multi-bacillary leprosy.

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### CI 312

#### CLINICAL PRESENTATION OF LEPROSY AMONG PATIENTS SEEN IN A TERTIARY DERMATOLOGIC CENTRE IN SINGAPORE

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A total of 65 cases of leprosy were seen at the National Skin Centre in Singapore between January 1995 and December 1999. About 90% of them present with a skin problem to a doctor. Most of them were asymptomatic, presenting as cosmetic complaint, while a few had pain and discomfort due to lesions of Type I and Type II Reactions. Red and white patches, which may be flat or raised were the most common morphology. One patient present as recurrent blistering lesions of the finger due to heat injury.

About 5% of patients presented with nerve thickening, abscess and loss of nerve functions to the orthopedic surgeons and neurologist and diagnosis were made on histological examination of tissue specimen removed during surgery.

Two patients presented in a moribund state due to widespread vasculitis of Lucio's phenomenon and succumbed to the disease rapidly.

In a number of cases, the diagnosis was not suspected until a biopsy was done and diagnosis made by a histopathologist.

As leprosy becomes less endemic and with the progressive closure of specialised diagnostic and treatment centres, diagnosis of leprosy will depend more on medical practitioners, who have the first contact with a patient. Knowledge of its presentation among them is important in the management of leprosy in the future.

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### CI 385

#### USE OF DAPSONE IN MONITORING COMPLIANCE TO DRUG INTAKE AMONG LEPROSY PATIENTS

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Compliance to treatment is perhaps the most important factor in success of the treatment of leprosy with Multi-drug Therapy Regime. We have been performing detection of dapsone in the urine as a mean of monitoring compliance to dapsone.

A patient can have a test done prior to consultation with the doctor randomly and without any prior notice.



Most patients have an average of 2 tests done per year. Most patients with specimen showing a positive test for dapsone claim to have been taking the drug regularly. Among those with negative test, most will also claim to be compliant but a few plead forgetfulness or busy work schedule for not taking the drug.

Our experience shows that a positive test has very little clinical value as patient learn very quickly to circumvent the embarrassment by taking the drug just prior to attending the clinic. A negative test, barring technical errors, is more useful as it show it is hard to cheat.

Though of limited value, we found urine dapsone detection using Erlich's reagent to be useful as it deters some patients from not taking the prescribed medication.

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### CI 102

#### CLINICO-PATHOLOGICAL COMPARATIVE STUDY BETWEEN COUNT OF BODY LESIONS AND THE NUMBER OF BODY ZONES INVOLVED IN LEPROSY

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The counts of body areas or zones involved are gaining importance as an alternative method to the number of lesions, in classifying leprosy patients into PB or MB patients for the purpose of therapy. In the present study we have attempted to compare the commonly practiced count of body lesions to the body areas or zones system of classification. We have included 108 patients of leprosy (male 80, female 28) for this study. We have divided the surface of the body into 7 areas - 2 upper limbs, 2 lower limbs, front and back of chest (2), and head and neck (1). The number of lesions in each patient was counted and zones involved charted. Slit skin smears and skin biopsies were performed on all patients.

It was observed that 34 patients had only single lesion of leprosy, whereas, patients with 2 to 5 lesions were 24, 6 to 10 lesions were 9, > 10 lesions were 41 patients. In patients with single lesion, the commonest clinical type was BT in 29 out of 34 patients and 4 patients each were of TT and Ind. Leprosy (IL). In contrast, on histopathology, BT was observed in only 13 out of 34 patients, 10 showed features of IL and 2 showed features of BL in histology. In 2 to 5 lesions group, all the 24 patients were clinically BT, whereas, on histopathology, only 16 out of 24 showed features of BT, while two showed features of BL. In 6 to 10 le-

sions group, 7 out of 9 patients showed clinical features of BT and 2 of BL. In this group clinico-histopathological correlation was better. In patients with > 10 lesions (41 pts), 24 showed clinical features of BT and 12 of LL.

When the number of zones of involvement was looked for, one zone involved in 43 patients, of which 37 were clinically diagnosed as BT and 4 as IL. On histopathology, 21 cases showed features of BT and 9 of

IL. In patients where 2 zones were involved (16 pts), 14 belonged to BT and 2 to BL clinical types while on histopathology, 7 showed BT, 2 BL and 5 IL features. In groups where 3 to 5 zones were involved (21 pts), clinico-histopathological correlation was good in BT and BL types. In patients with 6 or more zones, (28 pts) clinical and histopathological features correlated well, with most patients belonging to BL or LL leprosy. When the patients with < 2 zones were compared with patients with < 5 lesions, following observations were made. The number, of patients were 59 to 58 respectively in each group. There was very good correlation (96 to 100%) clinico-histopathologically between the two groups with most of the patients (89 to 94%) belonging to IT or BT clinical types. These results indicate that when two or less than two body areas are involved, it has similar significance as the presence of 5 or less than five lesions, for the purpose of therapy.

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### CI 116

#### BACTERIOLOGICAL PROFILE OF A LEPROSY CONTROL PROJECT

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Gremaltes Referral Hospital is doing leprosy control work in northern part of Chennai since the last three decades, covering a population of 10.68 lakhs in 1971, 15.15 lakhs in 1981,

21.22 lakhs in 1991 and 11.60 lakhs now. 56,932 patients has been detected over the years by a band of para medical workers, supervisors and doctors. The NLCP / NLEP guidelines are being followed from the beginning. Chennai District was put on MDT in February 1990 whereas Gremaltes used MDT since August 1981 in a phased manner. Skin smears have been taken for all eligible cases and they were stained and read by qualified smear / laboratory technicians. The district laboratory technician of the District Leprosy Society does cross checking.

The results of the bacteriological indices and morphological indices over the last eleven years viz-a-

viz the patient population is presented. The steady trend of BI (average: 7.69, range:

5.09 to 9.27) and fluctuating trend of the MI (average: 5.05%, range 1.39% to 10.10%) is discussed in the presentation.

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### CI 166

#### CLINICO-HISTOLOGICAL STUDY OF REVERSAL REACTION

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276 patients comprising of 157 active and 129 reactive Borderline Leprosy were followed up to 10 years. All patients had biopsies initially and at regression. 47 patients had three biopsies and 8 patients had 4 biopsies at times of varying clinical activity. 11 of the active and 13 of the reactive cases relapsed. Downgrading was observed in 23 reactive cases and 6 active cases. Neurological disabilities were encountered in 37 active and 30 reactive cases but in the latter, particularly in mid-borderline cases recovered with the subsidence of reaction.

While dealing with Reversal Reactions, it will be useful to mention the place in the spectrum namely Neurological disabilities were BT, BB, or BL since their progress differs widely.

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### CI 265

#### A RETROSPECTIVE STUDY OF 35 CASES OF PURE NEURITIC LEPROSY

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Objective : To study the epidemiological and clinical features of pure neuritic leprosy.

Methods : Read the case individual records, give the physical examination to patients and determine the pure neuritic cases.

Results : 35 pure neuritic leprosy patients were found among 616 cases with the proportion of

5.68%. Among these neuritic cases, the ratio of male to female was six with average onset ages of 32.57 years

old and their classification were mostly TT type. The percentages of one, two, three and more nerves involved in neuritic cases were 80%, 8.57% and 11.43% respectively. The ulnar nerve was most frequently involved and common peroneus nerve was the second one. All of 35 patients have sensory impairment with trunk type of 82.86% (27/35) and glove-sock type of 50% (2/4) of which happened in 3 and more nerves involved cases, in addition, 82.86% cases have the motor impairment. A biopsy taken from numb area containing a little nerve branch infiltrated in a case with 4 nerve damage showed negative AFB however, a nerve biopsy sampled from a case with 2 nerves involved showed positive AFB with 2 plus.

Conclusion : Pure neuritic leprosy cases accounted in a proportion and should be treated with MB regimens. Early diagnosis and classification were very important. It is suggested that referring system be established for early diagnosis and treatment to reduce disability and control infection.

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### CI 348

#### ADENOSINE DEAMINASE ACTIVITY IN ACTIVE LEPROTIC PATIENTS

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Adenosine deaminase (ADA) is a purine catabolic enzyme that catalyses the irreversible deamination of adenosine to inosine and 2-deoxyadenosine to 2-deoxyinosine respectively.

It was found that ADA was markedly increased in certain diseases and its estimation is used as a diagnostic tool in some diseases as pleural effusion due to tuberculosis, C.S.F., pericarditis. Its activity could differentiate tuberculosis from other pathognomonic disorders.

The aim of this work is to estimate ADA activity in leprosy patients and if the test may help in diagnosing leprosy as in case of tuberculosis.

Leprotic patients were diagnosed by the direct examination of the modified Z.N. stained skin smears and the patients were accordingly classified to the different types of leprosy. ADA activity was measured in these patients by the sensitive colorimetric method which is based on indirectly measuring the formation of ammonia when ADA acts on an excess of adenosine. The results obtained were compared with age matched apparently healthy Egyptian subjects. The results will be recorded, statistically analysed and will be presented.

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**CI 364****STEROIDS, CYTOKINES AND TYPE 1 (REVERSAL) REACTIONS**

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Corticosteroids remain the mainstay of treatment for leprosy reversal reactions. We were interested to examine the effect of steroids on cytokine profiles in reactional leprosy lesions particularly in respect of the timing of cytokine production and cellular recruitment into lesions. Do steroids switch off the Th1 drive associated with reactions and is this maintained?

We have studied 15 patients with Type 1 reactions. Biopsies were taken at day 0, 7, 28 and 180 days. Staining was done for IFN- $\gamma$ , IL-12 and iNOS. All patients were put on a standard reducing course of steroids starting at 30 mg daily after their first biopsy.

Prednisolone treatment had little effect on the cellularity and cytokine profiles at day 7. By day 28 significant decreases were found for IFN- $\gamma$ , IL-12 and iNOS for most patients. Some patients maintained cytokine production at day 28 and even at day 180.

These data illustrate the strong Th1 profile of Type 1 reactional lesions, the relatively slow response to therapy and the continuing activity at 180 days. The variation in individual responses emphasises the importance of looking at individual patient responses. Further prospective studies will be required to determine whether patient with high intra-lesional cytokine levels are at risk of recurrent reactions. The implications of these findings for future treatment of reactions will be discussed.

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**CI 369****THE USE OF ML-DIPSTICK AS AN ADDITIONAL TOOL TO CLASSIFY LEPROSY PATIENTS**

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Leprosy control faces the problem of misclassification of leprosy patients due to a lack of reliability of the classification system based on clinical criteria only. The correct classification of leprosy patients into paucibacillary (PB) and multibacillary (MB) is of crucial importance as the MDT regimen prescribed is based on this classification. Undertreatment may increase the

risk of relapse and may also prolong the time that the patient remains infective.

Our investigation sought to determine the usefulness of the ML-dipstick, a simple field assay to detect IgM antibodies to PGL-I of *M. leprae*. We conducted a trial on 264 leprosy patients comparing two methods for classification with the bacterial load in the skin.

Classification based on the number of lesions only (> 5 lesions = MB) was found to be 85% sensitive and 81% specific in the identification of MB patients. An increase in sensitivity could have been achieved when classifying patients considering both the number of lesions and the dipstick result. This would mean that patients are classified as MB when either dipstick positive or having more than 5 lesions, or being positive for both methods of classification. Patients negative for both dipstick and number of lesions would be classified as PB. This combined method was found to be 94% sensitive and 77% specific. The classification based on only the number of lesions left 15% of the BI positive MB cases classified as PB, while the combined method of ML dipstick and number of lesions left only 6% BI positive cases classified as PB.

In conclusion, introduction of the ML-dipstick as an additional tool besides clinical investigation can contribute to improved classification of leprosy patients for treatment purposes.

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**CI 409****SIDE EFFECTS OF DAPSONE AMONG PATIENTS TREATED FOR LEPROSY : A RETROSPECTIVE ANALYSIS**

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All leprosy patients receiving dapsone as part of MDT regime will have their G6PD level assessed as a baseline. The haemoglobin level, reticulocyte count, total white and differential counts and liver function tests were also done, as baseline and then at 3 monthly interval to monitor for the side effects.

Drug eruptions and hepatitis are uncommon adverse reaction and dapsone among our patients. A transient drop in haemoglobin levels and rise in reticulocyte count above 2% were commonly seen among the patients, but very few necessitates discontinuation of treatment.

No cases of drug hypersensitivity syndrome was observed, even though there were 6 cases of dapsone hypersensitivity, comprising dermatitis, hepatitis and leucocytosis, were seen among patients given for other skin diseases like vasculitis.

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## CI 92

### LEPROSY IN VARANASI

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The objective of the study was to see if the pattern of leprosy has changed after 17 years of MDT under NLEP in the district of Varanasi. All the patients attending a specialized dermatology clinic who were diagnosed as having leprosy and had not previously received MDT were recorded. The period of study was from 1st January to 30th June 2000. A total of 243-untreated first timers were analyzed according to age, sex, type of leprosy and duration since signs of leprosy were first perceived. This data was compared with the records of patients seen ten years ago. It has been a general observation by the field workers in leprosy that monolesions or other paucibacillary cases have increased after the successful implementation of MDT under NLEP. However, the clinic data from a specialized dermatology clinic which caters to both rural and urban population has thrown up data contrary to the field observations. Deformities, however have significantly reduced among the patients presented in the study. The possible reasons for differing data in the field and clinic setting will be discussed.

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## CI 223

### THE CLINICAL SPECTRUM OF LEPROSY - A REVIEW

*Dr. Alexander Thomas*

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A clinical spectrum of various forms of leprosy in Asia has been pictorially presented in a series of 54 slides collected over a period of 25 years in India and Bangladesh. Ranging from Mono lesion to PB, MB among women, men and children, with and without complications, of different forms of Type I and Type II reactions are lucidly presented in beautiful colours from Asian countries. Atypical and unusual involvement of eye, nose and extremities are highlighted in a fascinating and imaginative manner, with a view to impress field staffs, medical

students and doctors. The protean manifestations of leprosy are presented in a variety of clinical photographs. These slides can be demonstrated in a teaching session for all leprosy workers. Within the time limits many differential diagnosis also can be discussed.

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## CI

### CLINICAL ANALYSIS OF 111 LEPROSY PATIENTS WITH TYPE-1 LEPRO REACTION

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**Objective :** To investigate the incidence, clinical features and management of Type I reaction (RR) in the leprosy patients treated with WHO-MDT regimen.

**Methods :** To analyse the incidence, relation with classification, clinical features, occurrence and persistence of RR in 111 patients with RR.

**Results :** Among 2004 leprosy patients treated with MDT, 111 cases are diagnosed to have RR (5.54%) and 73.38% of them are borderline patients (BT, BB and BL). Of 111 patients with RR, there are 4 cases with skin lesions (3.60%), 93 cases with skin lesions and nerve impairment (83.78%) and 14 with nerve impairment (12.61%). 102 patients are diagnosed to have RR before and during MDT (91.89%), including 58 cases occurred in the first year of MDT (52.25%), and 69 cases with RR persisted for 6 months (62.16%).

**Conclusion :** Among leprosy patients treated with MDT, the incidence of Type I reaction is

5.54%, most cases are the borderline patients occurred in the first year of MDT. Type I reaction causes nerve impairment and persists for long time. Sufficient doses and course of steroid therapy can prevent and decrease occurrence of deformity.

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## CI 277

### CANCER AS CAUSE OF DEATH IN LEPROSY PATIENTS IN JIANGSU YANGZHOU OF CHINA

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There were 19463 of cumulative leprosy cases detected from 1950 to 1989 in Yangzhou Prefecture which is located in Jiangsu Province of eastern China and with the population 9151469(1989), 7 685 810(1970) and 5 962 066(1950).

The general situation of leprosy cases showed the following :

Among leprosy cases, 986 who died of with clear causes were processed. Among them, 318 cases died from cancer. The proportion of death in leprosy cases was different to general population, especially in women which had higher risk than men who die from cancer (OR=1.35,  $p<0.05$ ). The proportion with death due to cancer has increased in recent years. The order of death from cancer, the first cause was the stomach cancer, second oesophagus, third liver, which was alike in general population of Yangzhou. The results indicated that death from cancer had no relationship with leprosy type. Leprosy cases suffering from cancer seemed to have a correlation of period of leprosy disease.

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### CI 295

#### A SEVERITY GRADING FOR PATIENTS WITH ERYTHEMA NODOSUM LEPROSUM

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Patients presenting with erythema nodosum leprosum (ENL) have a wide variety of symptoms and severity. In order to rationally treat new patients with ENL, and to monitor their response to therapy with thalidomide, we have developed a severity scale for ENL. The following symptoms were included : the extent of ENL nodules, the character of ENL lesions, peripheral oedema, body temperature, anorexia, malaise, lymphadenopathy, hepatosplenomegaly, arthritis, orchitis, iritis, nephritis and neuritis. Scores for these symptoms were arbitrarily weighted to reflect their relative importance. Mild ENL was defined as a score of  $<11$  in the skin without blebs, pustules or ulcers and with an extracutaneous score of  $<9$ . Severe ENL was defined as a skin score 11 or the presence of blebs, pustules or ulcers, or an extracutaneous score of 9. We present data on 13 patients receiving thalidomide treatment whose scores were measured initially, and after 3, 7, 14, 21, and 28 days. The application of this severity score to the treatment and monitoring of ENL is discussed.

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### CI 308

#### SQUAMOUS CELL CARCINOMA IN CHRONIC PLANTAR ULCERS IN LEPROSY : CAULIFLOWER GROWTHS REVISITED

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Neoplastic change in longstanding plantar ulcers in leprosy patients have been well described (Srinivasan 1971) and at least one large series of cases documented (Richardus 1991, 38 cases). We present a large retrospective review of 40 cases over an 18 year period from a tertiary referral hospital in Nepal. Clinical features with clinico-pathological correlation, are detailed. Atypical features of biopsy and technique are described. Three out of forty patients (7.5%) died of metastatic disease. The role of groin node biopsy or fine needle aspirate are discussed. The place of groin node dissection and its role in early management, is presented together with a decision algorithm. Methods of local clearance and plastic reconstruction are also discussed.

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### CI 329

#### PANSAB - A SIMPLE SYMBOLIC APPROACH FOR THE DIAGNOSIS OF LEPROSY

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Leprosy is a chronic granulomatous disease with protean manifestations. The range of clinical manifestations and complications depend upon the immune response of the patient. Those with a high immunity tend to develop a paucibacillary type of leprosy and those with a low immunity a multibacillary type of leprosy. As an infectious disease, the delay in diagnosis and treatment contributes to a degree of transmission in the community. The long course of antileprotic treatment is started depending on clinical diagnosis which is based on the clinical presentation and examination of the skin, nerve and mucous membranes. The clinical diagnosis are sometimes confirmed by simple to more sophisticated tests available in the institution. For easy clinical diagnosis of leprosy, a simple systematic approach is search for and PANSAB is a mnemonic which can be applied to come at a conclusion. Here, P stands for patch or plaque, A stands for anaesthesia, N stands for nerve thickening, S stands for slit skin smear examination for AFB, A for autonomic dysfunction resulting in anhydrosis, warmth and hair loss and B for biopsy of the lesion for typical histopathological picture of leprosy. The expressions of the letters are tried sequentially to come at clinical diagnosis. The chrono-

logical steps involved in clinical diagnosis will be described in detail with application in the field work.

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### CI 365

#### LESSONS FROM THE DELAYED DIAGNOSIS OF LEPROSY IN LONDON, U.K.

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28 patients with a new diagnosis of leprosy have been seen at the Hospital for Tropical Diseases, London in the 3 years 1995-8. We have reviewed their case notes to establish their geographical origin, symptoms, skin signs, and neurological evaluation at presentation. We also noted how many doctors they had seen before the diagnosis of leprosy was made and the incorrect diagnoses made.

54% of our patients came from the Indian subcontinent, but all major leprosy endemic areas are represented. Three patients were Caucasian British but acquired leprosy during long residences in the Indian subcontinent. The median time from onset of symptoms to diagnosis was 3.1 years. The mean time from entry to the UK to diagnosis was 7.9 years.

All types of leprosy were seen. 21 patients had typical skin lesions and 22 had thickened peripheral nerves. 8 patients presented with reversal reactions and 1 with erythema nodosum leprosum.

In 23 cases the diagnosis of leprosy had been delayed. Misdiagnosis as dermatological (7), neurological (6) and orthopaedic/rheumatological conditions (9) was common. 61% of patients had significant nerve damage at the time of diagnosis that required specialist management.

This case series has implications for the development of leprosy services as the leprosy case load diminishes in previous endemic countries. Leprosy patients will no longer present to specialist leprosy services. Doctors in many specialities will need ongoing medical education to ensure that they recognise leprosy.

**Conclusion :** Leprosy patients outside leprosy endemic areas present to a wide range of doctors. Misdiagnosis can only be reduced if doctors consider the possibility of leprosy in patients from endemic areas with skin rashes, neurological or joint symptoms.

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### CI 374

#### THE LEPROSY AND THE BURULI'S ULCER ANALOGIES AND DIFFERENCES Dr.Jose

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The analogies and differences of these two Mycobacteriosis are exposed to coincide in belonging to the same bacteria family, in their geographical localization, in tropical and subtropical areas and in affecting populations with faulty socio-economic conditions.

Most notable differences in the Buruli's ulcer are the following : it is possible to cultivate, it has a short period of incubation, its location takes only place in the skin and subcutaneous cellular tissue, the Mycobacterium ulcerans produces an exotoxine, its localization is extracellular and the treatment is eminently surgical.

It must be insisted in the great increase of the Buruli's ulcer and its possible diffusion to other countries mainly in the necessity to avoid the comparison with the leprosy in the negative aspects of commenting that the Buruli's ulcer is not the leprosy of the XXI century.

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### Ch 74

#### EVALUATION OF MULTI-DRUG THERAPY IN URBAN LEPROSY UNIT, PATNA MEDICAL COLLEGE HOSPITAL, PATNA - A 15 YEARS STUDY IN 14,000 CASES

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Elimination of Leprosy from about 95% of the world has become possible due to WHO MDT, PB or MB. 6 months PB MDT & 12 months MB MDT are being evaluated in 14,000 cases of Hansen's disease visiting urban Leprosy Centre PMCH & Leprosy Research Centre, Patna from 1985 to 2000.

DDS daily and supervised Rifampicin once a month in empty stomach was given for 6 months in PB leprosy. Additional Clofazimine (300 mg. 1st day & 50 mg daily) was given for 2 years (upto 1998) and 1 year after 1998) clinical, bacteriological evaluations were done monthly. Follow-up was done for 2 years in PB and 5 years in MB leprosy.

Droup-outs : 1100, Died: 20, Asked transfer : 280, Completing treatment: 12,600 (PB 7,200 MB 5,400) Male (7,500) Female (5,100) Child (3,200) Adult (9,400). Highest number of cases in 20-30 years of age group, Deformity (15%), Ulcers (6%), Cure rate in PB (97%), MB (94%). Regularity of treatment PB (99%),



MB (91%), Relapse rate PB 2%, MB 5%. Incidence of Type I reaction 8%, Type II reaction 6%. Regularity of treatment was more and deformity reactions were less in MB MDT 1 year. Multi-drug therapy is very effective in Hansen's disease.

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## Ch 77

### CLARITHROMYCIN IN MULTIBACILLARY LEPROSY

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MB MDT in MB leprosy is very effective but in some cases either Dapsone or Rifampicin or Clofazimine is not well tolerated. In this case Clarithromycin a macrolide, bactericidal drug is as good as Rifampicin alone or in combination.

100 cases of MB leprosy, all adults were randomized in 2 groups :

Group A (50 cases) : WHO MB MDT for 1 yr.

Group B (50 cases) : Clarithromycin (500 mg) daily for 56 weeks.

Clinical & bacteriological evaluations were done monthly for 1 year and then 6 monthly for 5 years.

Drop-outs : A-5 B-0

Completing t/t A-45, B-50

Cured A-44 (98%), B-50 (100%)

Relapse rate : A - 0 B - 0

Side effects in both the groups were comparable.

Clarithromycin (500 mg daily) for 8 weeks is a very effective treatment modality for multibacillary leprosy especially for those who may afford it and who don't want to go for routine MDT due to long duration and known side effects of ichthyosis and hyperpigmentation.

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## Ch 83

### ANALYSIS OF MICRONUCLEUS INDUCTION IN LEPROSY PATIENTS WHO ARE UNDER MULTI-DRUG THERAPY

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A cytogenetic study was conducted on peripheral blood lymphocytes of leprosy patients who are under multi drug therapy (MDT). Our previous study showed that there is a DNA damage in leprosy patients who are under MDT. In this experiment micronucleus (MN) test was conducted on the peripheral blood lymphocytes (PBL) of 50 leprosy patients. The result of this study shows that the frequency of lymphocyte with micronucleus (2-4%) was significantly more ( $P < 0.05$ ) in leprosy patients when compared to the controls. To ascertain the role of anti-leprotic drugs in the observed DNA damage in leprosy patients an invitro study was conducted using single cell gel electrophoresis assay on human peripheral blood lymphocytes. The lymphocytes were treated with different doses of rifampicin, dapsone and clofazimine for short period (30 min). Dapsone seems to induce DNA damage in human PBL which is not statistically significant at 30 minute of exposure. So we propose to increase the period of exposure up to 2 hours. The results of exposure to longer period in keeping with the human dosage schedule will be presented.

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## Ch 136

### SIGNIFICANCE OF RECURRENCE OF SKIN AND NERVE LESIONS AFTER MULTI-DRUG THERAPY IN MB LEPROSY

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#### Introduction :

While implementation of WHO recommended MDT through control programmes has led to excellent progress, an increasing number of follow up studies on patients treated with MDT have however demonstrated viable organisms as well as clinical relapses. Reappearance / recurrence of lesions in treated cases has profound implications for case management, disease transmission and control. It is also speculated that patients receiving prolonged course of steroids may be prone to developing delayed clinical problems which could either be reappearance of lesions or true relapses. Similarly, difficulty in distinguishing clearly on clinical grounds a late reaction from relapse limits the estimation of the magnitude of the problem of true recurrence. In view of this, we are investigating the magnitude of the problem as well as the clinical, bacterial and immunological significance of recurrence of skin and nerve lesions in MDT treated cases.

#### Methodology :

Treatment records of all patients with a minimum period of 5 years follow-up after MDT, registered in BLP, were taken up for study in a retrospective analysis. The data was collected in a specific format with respect to clinical problems, namely development of new lesions, extension of old lesions, characteristics of skin lesions, duration of follow-up, steroid administration and neurological status. The patients were assessed for clinical, neurological and bacteriological status. The patients were then referred to FMR for investigation, viz assessment of bacterial load, antigen load and drug sensitivity tests.

#### Results :

Sr. No. Activities Number

1. MB cases registered 1982-1994 2976

2. Records analysed 1852

3. Patients identified having Clinical Events 37 (1.9%)

Continued on next page Observations Observations:

The above analysis showed that a small proportion (1.9%) of treated patients do report with recurrence of lesions, the etiology of which needs to be investigated. However, it appears that true relapses are small in number, though they do occur. The data will be discussed. The bacteriological and immunological significance and their clinical co-relation are being studied and the results are awaited.

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## Ch 154

### RECENT ADVANCEMENTS IN HANSEN'S MANAGEMENT

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WHO MDT is very effective in the treatment of Hansen's disease, but time required is the only drawback - 6 months / 1 year. Search for shorter duration Antileprotic regimens have yielded good result. Combination of Ofloxacin / Sparfloxacin with Rifampicin kills all living *Mycobacteria* within 28 days. This becomes possible due to synergism and better tissue penetration.

1200 cases of MB HD, all adults were randomised in 3 groups :

Group A 400 : WHO MB MDT for 1 yr.

Group B 400 : Rifampicin 600 mg Empty stomach + Ofloxacin (400 mg.) OD = 30 days

Group C 400 : Rifampicin 600 mg OD +

Sparfloxacin 200 mg OD = 30 days

Evaluation was done monthly for clinical activities and bacteriological status. Follow-up was done monthly in group A and 6 monthly in group B & C upto 1 yr. and then 6 monthly in all groups upto 5 years.

Cure rate in Group A was 94%, B 90%, C 86%.

Side effects of Ichthyosis & hyperpigmentation were least in Group B. Relapse rate was least in Group A and maximum in Group C. Nausea, vomiting, arthritis were more in Groups B & C. Rifampicin & Ofloxacin combination was most effective due to its shorter duration and less adverse effects and may be given in selected cases not willing to go for routine WHO MDT.

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## Ch 217

### CHEMOTHERAPY OF LEPROSY IN THE NEW MILLENNIUM

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**INTRODUCTION :** Though leprosy has afflicted mankind since time immemorial, effective therapy for leprosy became available only after 1946, when Robert Crochane first used dapsone for treatment of leprosy. Subsequently clofazimine and rifampicin were discovered, and in 1981, WHO recommended the MDT regimens for leprosy using these 3 drugs. The MDT regimens proved to be highly effective, having cured more than 8.4 million leprosy patients till the beginning of 1997.

**PHARMACOLOGY OF ANTILEPROSY DRUGS :** We present a brief overview of clinical pharmacology of the traditional antileprosy drugs mentioned above, as also of the newer ones that have emerged in the past decade, notably ofloxacin and minocycline. We also make a brief mention of newer agents that have shown promise in experimental studies.

**VACCINES :** Recently, a number of vaccines have been tried for leprosy, particularly BCG, *M vaccae* and *M w*. We document the results of various studies investigating these vaccines.

**NEWER REGIMENS :** In the recent years, a large number of alternative regimens combining the newer drugs with the traditional ones have been suggested and tried. Shortening the duration of effective treatment is the main objective sought to be achieved. In addition, these regimens are valuable in cases of resistance to existing drugs, or if the patient is unable to tolerate the existing



drugs. Some of these new regimens have been accepted by WHO as effective and viable. We document the results and conclusions of various studies that have investigated such alternative regimens.

**CONCLUSION :** The success of WHO MDT regimens have brought us a step closer to elimination and probably even eradication of leprosy. Emergence of newer, shorter, cost-effective regimens with many operational advantages has further given a shot in the arm to leprosy elimination programmes. However, in-depth studies of efficacy of these regimens, as also a long-term follow-up need to be carried out before they are implemented in the field. A judicious use of the advances made in pharmacotherapy of leprosy will indeed make possible the eradication of leprosy in the new millennium.

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### Ch 234

#### A THERAPEUTIC TRIAL OF 'ROM' IN MULTIBACILLARY LEPROSY

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ROM has been advocated as an alternative drug regimen in MB leprosy (WHO 1998). We here present a comparative clinical trial of ROM versus WHO MB MDT in 30 MB leprosy patients.

15 patients (LL-7; BL-6 & BB-2) (Male-13, Female-2) were given daily ROM (Rifampicin 600 mg; Ofloxacin 400 mg and Minocycline 100 mg) for 28 days and thereafter once a month supervised dose for 12 pulses. An equal number of age, sex and class matched controls were taken whose BI closely matched the cases on ROM. These 15 patients received WHO MB MDT as per standard NLEP protocol.

The clinical course of these patients were closely monitored every month using Ramu's Clinical Score and a modified Ramu's score. Slit skin smears were done at start of therapy and repeated every 6 months. Special care was taken to record reactions, neuritis and adverse side effects. Statistical tests of significance were applied to the results.

Results indicate that there is a significant overall clinical response to ROM therapy over WHO MDT. Fall of BI was also quicker with ROM therapy. Reactions (Type I & II) and neuritis were more common in ROM patients. Adverse drug reaction were not encountered in either group.

This study highlights the efficacy of ROM therapy in

MB leprosy, its operational ease of administration & the caution regarding reactions with its use as an alternative drug regimen.

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### Ch 244

#### COMPARISON STUDY ON DDS SYNDROME HAPPENED IN DURATION OF MDT AND DDS MONOTHERAPY

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**Objective :** To study the incidence of syndrome caused by DDS from MDT and DDS - monotherapy respectively.

**Methods :** To look over the case individual records and look into cases for confirming the occurrence of DDS syndrome.

**Results :** 4 cases treated by MDT and 2 cases treated by DDS-monotherapy occurred DDS syndrome. Incidence of them were 2.6% (4/153) and 0.098% (2/2044) respectively and showed high significance ( $P < 0.01$ ).

**Conclusion :** It is suggested that the cases treated by MDT regimens be carefully observed to find the DDS syndrome and cope with it.

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### Ch 258

#### CLINICAL ANALYSIS OF 12403 RELAPSED LEPROSY CASES IN CHINA DURING 1949-1998

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In order to study clinical characteristics and the trend of leprosy relapsed cases after DDS mono-therapy or MDT from 1949 to 1998, the authors analyzed the data on leprosy relapsed cases in China from 1949 to 1998 by computer. The results showed that a total of 12403 leprosy relapsed cases from 1949 to 1998 in China with a cumulative relapsed rate of 3.28%. Among them, 11803 were relapsed after DDS mono-therapy with a relapsed rate of 3.83% and 236 were after MDT with a relapsed rate of 0.57%. The relapse rate in previously DDS-treated PB cases with MDT was

higher than that of PB cases only treated with MDT. The relapsed rate in previously DDS treated MB cases with MDT was also higher than that of MB cases only treated with MDT. The rates of disability grade 2 and skin smear positive in relapsed cases were 49.9% and 69.3% respectively. The authors consider that the peak of leprosy relapse after DDS mono-therapy occurred during 1959-1988 which was 20-years after beginning of DDS mono-therapy, it is possible that the peak of relapse after MDT should occur in the next decades.

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### Ch 284

#### A CLINICAL EFFECT OF THE REGIMEN COMBINED WITH DAPSONE, RIFAMPICIN AND OFLOXACIN

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Objective : To study the clinical effects of the regimen consisted of DDS, RFP and Ofloxacin.

Methods : 20 MB cases treated with the regimen and 26 MB cases treated with WHO MDT regimen were compared. In these two groups, WHO criteria in case selection and observation as well as effect judgement were executed severely. All the treated cases were followed up for 5 years.

Results : The active skin lesions disappearing time in the treating group is similar to that of the comparison group. The cure period averaged about 39 and 40 months in the treating and comparison groups respectively. There is no leprosy reaction in the treating group but there are 2 cases with leprosy reaction in the comparison group. BI declined averagely 0.78 and 0.76 annually in the two groups respectively and showed no statistical difference ( $P > 0.05$ ). Moreover, the treating group has less side effect than the comparison group.

Conclusion : The new regimen has similar effect to WHO MDT regimen but less side effects and good acceptance can effect the regimen to be spread out in the future, especially in the condition of lack of Clofazimine at the grass-roots level.

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### Ch 387

#### DEPIGMENTATION - DELAYED SEQUELAE OF LAMPRENE THERAPY

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The development of depigmented lesions resembling vitiligo in those who had received chemotherapy with MDT was observed. Also it was noted that only those who received chemotherapy with MB MDT regimen presented with these kinds of lesions. The drug lamprene is the only component, which distinguishes the multidrug therapy of MB type from that of PB. Lamprene is a rimino-phenazine dye and is known to cause skin discoloration (pigmentation). The severity of this largely depends on the dose of lamprene and the degree of skin infiltration by leprosy. Discontinuance of the drug leads to clearance of most of the pigment within 6 - 12 months, although traces may remain as long as 4 years or more. Could it be possible that the depigmentation observed is a delayed sequelae of lamprene therapy? The details of the observed cases will be presented.

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### Ch 07

#### EFFICACY OF ROM IN PAUCIBACILLARY LEPROSY

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A total of 30 Paucibacillary leprosy patients (M 18, F 12) were included in this study, out of which 22 patients presented with single skin lesion and 8 patients had more than one lesion. The clinical profile of these patients and their response to ROM therapy was studied. The response to treatment was assessed using clinical scoring. Clinical classification of these patients were done (BT 27, TT 3) and their immunological status was determined using Mitsuda antigen (Lepromin positivity in 25, Negativity in 4, Not recorded in 2). 18 patients showed borderline tuberculoid histology, 7 tuberculoid and 4 indeterminate histology. AFB was present in the skin biopsies of 5 patients and absent in 25 patients. 4 patients showed clinically and histopathologically features of reversal reaction, and they responded well to corticosteroids. A repeat skin biopsy will be at end of 6 months. The histopathological features and the clinical findings of these patients with reference to the signs of activity and inactivity and the correlation will be discussed.



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## Ch 45

### SINGLE LESION LEPROSY TREATED WITH ROM - RELAPSING AS PB LEPROSY

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118 patients who had been inducted into a double blind controlled clinical trial comparing ROM treatment for single skin lesion leprosy with WHO recommended PB-MDT were followed up for a period of 36 months. 14 were lost to follow-up. Among the 104 remaining patients, we have noticed 3 non-responders to ROM therapy. The first case was put on 6 months PBMDT to which he responded, but presented with Type-I reaction like features at 36 months follow-up. The second patient was a 15-year-old female who was asymptomatic for 30 months following ROM therapy and then started noticing new patches appearing. Smears were negative. The third patient had deteriorated during the ROM trial; after decoding he was put on PB-MDT to which there was full clinical resolution. This patient presented with new hypopigmented patches in both lower limbs, trunk and face after three years. Since the ROM treatment has now become widely accepted, the authors feel it is important to keep in mind non-responders as mentioned above. The clinical significance of such findings and relevance to anti-leprosy programmes in the present context will be discussed.

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## Ch 48

### ROM VERSUS PB/MDT IN TREATING PB LEPROSY WITH 2-3 SKIN LESIONS

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51 patients with PB leprosy two to three skin lesions were included in this study. By random allocation 26 had ROM and the remaining had standard WHO PB/MDT. 30% of the patients were biopsied at intake after 6 months and after 2 years. Of these patients, 7 had ROM and 4 had WHO PB/MDT. Clinical improvement was seen in most of the patients in both groups. The histopathological picture showed that there

was reduction in granuloma fraction in both categories of patients and bacterial clearance was also noticed in both the groups at the end of two years follow up.

This was part of a multi centric double blind randomised clinical trial which was undertaken to compare the efficacy of the single dose ROM regimen with that of the standard WHO PB/ MDT regimen in the treatment of PB leprosy patients with two to three skin lesions.

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## Ch 52

### SINGLE DOSE TREATMENT OF PAUCIBACILLARY LEPROSY - OBSERVATIONS ON LARGE LESIONS - A CASE REPORT

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A single dose treatment with Rifampicin (R), Ofloxacin (O) and Minocycline (M) combination (ROM-1) for single skin lesion (SSL) leprosy is being practised and initial experiences on efficacy and delayed clinical problems have been published. Such treatment in PB leprosy with 2-5 lesions is under trial and initial experiences show favourable outcome in terms of clinical regression and.

There is a need to make observations on large single lesions after ROM - 1 in view of apprehension in terms of clinical efficacy of ROM - 1. There is also speculation that relapses / reaction may result in large lesions after ROM - 1. Hence we proposed to make observations on cases of large lesions treated with ROM - 1 in a series of single lesion cases. We present a case report of regression noticed after ROM - 1.

Patient RK M/30 years presented with a hypo-pigmented patch with raised margins on left knee extending with pseudopodia to the medial and lateral side of knee. There was no nerve involvement. BI was negative. He was administered a single dose of ROM. Photographs were taken from various angles to note the course of the lesion during surveillance period in addition to the dimensions of the lesion charted out.

On subsequent follow-up after 6 months the borders were flattened and the lesions appeared faint in appearance and regressing well. The patient will be observed further periodically.

We conclude that one large lesions treated with ROM-1 regimen also show regression and behavior in a similar pattern as the clinical small size lesions. The other cases in the series also continue to show regression. However, longtime observations will be useful to study the course of the disease. 1

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## Ch 56

### CLINICAL FOLLOW-UP OF 2-5 SKIN LESION PB CASES TREATMENT WITH SINGLE DOSE ROM

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The present study included 31 PB Leprosy patients having only skin lesions (2-5 lesions) treated with single dose ROM under supervision. Clinical description of lesions in terms of number of lesions, hypo-pigmentation, skin thickness, sensory impairment was recorded initially and subsequently every month for 6 months and thereafter every 6 months.

The results of clinical follow up at the end of 6 months, 1 year and 1 and 1/2 years are given below :

Clinical Status Period of Follow up

6 months 1 year 1 and 1/2 years

Regressed 29 (93.5%) 21 (91.3%) 10 (90.9%)

Static 02 (6.5%) 02 (8.7%) 01(9.1%)

Progressed 00 00 00

No. of Patients 31 23 11

The results are comparable with the identical patients on MDT-PB indicating that PB patients with 2-5 skin lesions can be effectively treated with single dose ROM.

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## Ch 76

### ROM IN 1 - 3 LESION H.D.

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Paucibacillary MDT is very effective in PB leprosy. Recently WHO has introduced ROM IN Monolesion Leprosy. Even in PB upto 3 lesions ROM has been found to be equally rewarding. A comparison has been made to evaluate ROM V/S WHO PB MDT in 1-3 Lesions PB Hansen s Disease.

2,700 smear negative, normal nerve, fresh cases of

PBHD in the age range of 15-60 (Male 1,500, Female 1,200) were randomized in 2 groups :

Group A : 1,350 Cases: ROM (Rifampicin 600 mg.  
Ofloxacin 400 mg,

Minocycline 100 mg), single dose, empty stomach.

Group B : 1,350 Cases: WHO PB MDT (Adult)G  
months.

Criteria for Cure :

Reduction in size, colour, infiltration, disappearance  
of lesions, improvement in sensation.

Grading : 3 to 0 (15 to 0 Score)

Follow-up : Monthly (6) then 6 monthly (5 years)

Drop-outs : Group A 14 (10%), Group - S : 7 (5%),

Cured Cases : A:1,309(98%), B:1,317(98%)

Relapse & side effects in Group A & B were equal.

ROM in PB Hansen s disease upto 3 lesions is compa-  
rable with traditional WHO PB MDT.

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## Ch 93

### A SINGLE DOSE SUPERVISED REGIME FOR PAUCIBACILLARY LEPROSY

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.Pandhi & Dr. M.K.Singh* New Delhi

An ideal regimen for treating leprosy is supervised single dose therapy making it 100% patient-compliant with several operational advantages. In an effort to extend the scope of ROM regimen for single lesion leprosy, we compared the efficacy of standard WHO-MDT for paucibacillary leprosy (control group) with a regimen of rifampian 600 mg + sparfloxacin 400 mg + minocycline 100 mg + clarithromycin 1000 mg given as a single supervised dose. The patients selected had a maximum of 3 lesions which could include a single thickened nerve. The number of patients in each group was 15. A monthly evaluation for 6 months and then at 3-monthly intervals was done in respect to the size of the lesion, discoloration of skin, induration and sensory deficit and the improvement was graded over a score of 0-4 for each of these 4 parameters, 4 being the maximum improvement. Histopathological evaluation of skin lesions (in all patients) and nerves (66.6% patients) was done. At 12 months, the net % improvement in the study group was 66.9% while in the group receiving WHO-MDT-PB was 55.14% and the response was comparable statistically in both the groups (P>0.05). In the study group 66.70% patients showed a



marked improvement while 40% patients in the WHOMDT group showed a comparable response. This single dose treatment could have tremendous operational advantages as well as be more patient friendly.

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### Ch 149

#### EFFICACY OF SINGLE DOSE ROM FOR SINGLE LESION PB LEPROSY

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**AIMS AND OBJECTIVES :** To evaluate the efficacy and safety of a combination of Rifampicin plus Ofloxacin plus Minocycline administered as a single dose for single lesion paucibacillary leprosy.

**MATERIALS AND METHODS :** 30 skin smear negative paucibacillary patients having only one skin lesion were treated with a single dose of ROM (rifampicin 600mg + ofloxacin 400mg + minocycline 100mg) after a complete clinical, histopathological and bacteriological evaluation. Patients were examined once every month for 6 months, then at the end of 12 months and 18 months. At the end of 18 months, complete clinical and histopathological examination was repeated.

**RESULTS :** Of the 26 patients who completed 18 months follow up, complete clinical cure was seen in 12(46%), marked clinical improvement was seen in 12(46%), and treatment failure was seen in 2(7%) patients. None of the patients had any significant adverse effects, or any signs of reaction. Before treatment, 20 out of the 26(77%) patients showed a granulomatous infiltrate on histopathological examination, while at the end of the study, 5 out of 26(19%) patients showed a granulomatous infiltrate. There was a definite reduction in granuloma fraction in all except one patient.

**CONCLUSION :** Single dose of ROM (rifampicin 600mg + ofloxacin 400mg + minocycline 100mg) is almost as effective as the standard WHO/PB/MDT for the treatment of single lesion PB leprosy. It is easily acceptable, cost effective, safe and easy to administer. It is particularly useful in patients whose follow up is not guaranteed.

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### Ch 184

#### RELAPSE RATE IN SINGLE DOSE TREATMENT IN PAUCIBACILLARY LEPROSY

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A single dose treatment with rifampicin(R), ofloxacin(O) and minocycline(M) combination (ROM-1) in SSL-PB leprosy is being practised and initial experiences on efficacy and delayed clinical problems have been published by the authors. Such treatment in PB leprosy with 2-5 lesions [PB (2-5)] is under trial and initial experiences have been also reported by the same authors. Both these groups showed late clinical problems such as occurrence of new lesions, persistence of lesions and relapses in addition to reactions. There is a need to define and quantify delayed clinical problems in the field, which are to be diagnosed and managed as relapses or reactions and to interpret their significance in relation to patients who benefited from ROM - 1 in SSL-PB and PB (2-5) groups.

A treatment period cohort observation of ROM - 1 treated 620 SSL-PB and 282 PB (2-5) patients yielded 35 late clinical problems other than reactions. The period of follow up ranged from 6 months to 48 months. The mean period of follow-up is 2.4 years in SSL - PB and 2.1 years in PB (2-5) leprosy groups. 28 clinical problems were treated with a standard course of steroids out of whom 14(50%) showed good clinical response. 8 out of the remaining 14 who did not respond to steroids were diagnosed as relapses. The mean incubation period for these relapses is 2.4 years.

Relapse Rate in ROM - 1 treated PB leprosy

Events SSL - PB PB (2 -5) Total

No. of patients followed up 620 282 902

Person years follow-up 1480 600 2080

No. of patients with delayed 17(2.7%) 18(6.4%)\* 35(4%) clinical problems (11.5/1000 py) (30/1000 py) (16.8/1000)

No. of patients relapsed 04 (0.64%) 04 (1.42%)\* 08 (0.9%)

(2.7/1000 py) (6.7/1000 py) (3.8/1000 py)

\*  $p < 0.05$  \*\*  $p > 0.05$

Continued on next page Overall 99% of the patients received the benefit of this single dose of treatment. This study showed that ROM single dose in patients with 1 to 5 lesions of PB leprosy group is quite effective and the delayed clinical problems could be managed in the field satisfactorily. The relapse rate is less than the rate in PB leprosy treated with WHO-MDT. This confirms of an observations on a smaller group made earlier.

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### Ch 375

#### COMBINATION OF RIFAPENTINE-MOXIFLOXACIN-MINOCYCLINE (PMM) FOR THE TREATMENT OF LEPROSY

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Despite the great success of standard MDT regimens, newer regimens are required that are more efficient and operationally less demanding. One of the concerns with regard to MB regimen is that it is difficult to persuade patients to comply with the self-administered daily dapsone and clofazimine, which are required to ensure elimination of spontaneously occurring rifampin (RMP)-resistant mutants before stopping chemotherapy. Hence, resistance to RMP may develop among MB patients if the daily component is not taken regularly. The risk of resistance might be significantly reduced if a monthly administered, fully supervisable MDT regimen were developed, so that all of the components could be administered once monthly under supervision. The combination RMP-ofloxacin (OFLO)-minocycline (MINO), or ROM, is the first monthly administered, fully supervisable MDT regimen. However, compared with that of RMP, the bactericidal activities of both OFLO and MINO are rather weak; the combination OFLO-MINO (OM) was significantly less active than was RMP alone, and combination ROM was no more bactericidal than was RMP alone. To increase further the efficacy of a monthly administered, fully supervisable MDT regimen, it would be desirable to substitute more powerful bactericidal agents for the components of ROM.

The objectives of the experiment are to measure the bactericidal activities against *M. leprae* of various new drugs and combinations in mice, and to compare these with the activities of established drugs. Bactericidal activity was determined by proportional bactericidal technique in mouse footpad system. Administered in five daily doses of 100 mg/kg, HMR 3647 and clarithromycin killed, respectively, 90.0% and

74.9% of viable *M. leprae*, but the difference did not attain statistical significance between the two macrolides. Administered as a single dose, moxifloxacin (MXFX) 150 mg/kg killed 92.1% of viables, more bactericidal than OFLO in the same dosage and displayed the same level of activity as RMP in a dosage of 10 mg/kg; the combination MXFX-MINO (MM) was more bactericidal than OM; rifapentine (RPT) in a dosage of 10 mg/kg killed 99.6% of viable organisms, more bactericidal than RMP in the same

dosage, and even more active than the combination ROM, which killed 95.0% of viables; the combination RPT-MXD(-MINO) (PMM) killed 99.9% of viable bacilli, and was slightly more bactericidal than RPT alone, indicating that the combination PMM showed an additive effect against *M. leprae*. These promising results justify a clinical trial among lepromatous patients, in which the combination MM is being compared with OM, and PMM with ROM, in terms of efficacy and tolerance.

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### Ch 388

#### A STUDY OF INCIDENCE OF RELAPSE IN MONOTHERAPY AND MULTI-DRUG TREATMENT

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The incidence of relapse rate in leprosy patients amongst those given monotherapy were compared with patients given Multi Drug Treatment. In Kolhapur District during 1990-95, 1998 patients were treated with monotherapy and during 1995-2000, 2557 patients were given Multi Drug Treatment. In patient treatment with monotherapy 59 (2.95%) showed relapse & only 4 (0.14%) patients showed relapse while on Multi Drug Treatment regimen.

It was also noted that conversion from infectious to non infectious occurred in shorter period in Multi Drug Treatment compared to monotherapy also regularity is of paramount importance in preventing relapse.

In conclusion, relapse rate was very low & deformities reduced in Multi Drug Treatment if regular schedule is meticulously followed.

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### Ch 44

#### CASE REPORTS OF RELAPSES AFTER MB-MDT Dr.(Mrs.)

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Multi-drug therapy was initiated in India in the early 1980s. Following this, thousands of leprosy patients



have been treated and released from treatment. Richardson Leprosy Hospital with a control area of 2.7 lakhs and a much larger catchment area has treated and released from control many thousands of cases. The numbers of relapse cases observed have been very low. Nonetheless, the rare reports of relapses which are highly bacilliferous are a cause for concern. While MDT has presumably reduced transmission within society, highly bacilliferous presentations of relapse cases have been observed by us. We report here four cases that relapsed. All patients received strictly supervised treatment. The first two cases received the standard 24 dose WHO recommended MB-MDT. One of them reported back 15 years after RFT with BL leprosy in Type-I reaction; the other reported with diffuse infiltration and one nodule on the abdomen with BI 4+ on the nodule. The third patient received closely monitored WHO recommended MB-MDT doses for over 5 years (prior to the fixed duration treatment era). After an intervening smear negative period of 9 years, he reported as a full-blown leproma. The last case had received 17 pulses of WHO recommended MB-MDT and had to discontinue treatment for side effects. He was consistently smear negative for 13 years but reported with unequivocal bacteriological relapse with one site reading BI = 4+.

Studies on relapse rates and risk of relapse have been done by many researchers. The concern that this paper raises is the risk that highly bacilliferous cases of relapse can pose for society in an age that is talking about the eradication of leprosy. The clinical and laboratory findings and subsequent clinical course of these cases will be detailed and discussed.

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## Ch 54

### RELAPSING MULTIBACILLARY LEPROSY - A NEW DIMENSION TO TRANSMISSION IN URBAN AREAS

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It is too well known that a bacterial disease cannot be eradicated by chemotherapy alone. Several factors still have to be considered in breaking the chain of transmission. Besides hidden untreated skin smear +ve cases, the contribution of patients relapsing with MB leprosy with +ve skin smears (irrespective of their classification) has not been adequately documented. Though relapses are few in relation to the number, this phenomenon brings a new dimension to the hidden as-

pects of transmission of leprosy, particularly in densely populated cities.

In our experience only one case relapsed 8 years after RFT out of 416 MB cases whose initial BI was more than 3+ and who were followed up for periods ranging from 5 to 13 years. (Table - 1) On the other hand, it is also true that sporadic relapses eluding attention keep reporting voluntarily, well beyond the specified surveillance periods posing a threat of transmission (Table - 2, Fig.1-9).

Table - 1. Relapses in relation to duration of follow-up  
Treatment No. of Follow-up after RFT patients

5-8 9-12 13-16 years years years

FDT-24 76 43 26 7 FDT-12\* 45 37 8

TOTAL 121 80 34 7

\*FDT- Fixed Duration Therapy-1 patient has relapsed

Continued on next page Table - 2: Relapses in relation to mean duration

Treatment Number of Mean duration after relapses  
RFT

MDT >24# 12 11 1/12 years FDT - 24 5 9 4/5 years  
FDT - 12 1 8 years ROM - 1 2 2.10 years RO 3 3 years

# Many patients in this group had received MDT for many years beyond the period of skin smear negativity (Some were on DDS monotherapy prior to MDT). Relapses seem to occur as indicated in the following schematic diagram.

Treatment period 24 months

1234567 1415

\* Period of risk of relapses necessitating mop-up

s 12 mts

# Short course Chemotherapy

s\* Unfortunately it is during this period that 1) there is a severe lack of field manpower and

2) patients are likely to be missed in highly urbanized. It is a paradox that at the most crucial stage after induction of the treatment, the programme loses its hold on the disease owing to reasons of logistics when the disease management demands serious attention and substantial financial support. If retrieval is not planned, one may never understand the course of this chronic disease and as a consequence, the very soul of leprosy work will be lost.

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**Ch 66****RELAPSED AFTER NDT - AN EXPERIENCE IN WARDHA DISTRICT***Dr.G.K.Jadhav & Dinesh Hiwase*

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MDT was introduced in Wardha District in 1981 and till March 2000, 42,598 cases were treated with MDT and declared RFT. Among these cases, relapses were reported in some cases during the period of surveillance. Some more cases reported themselves after the period of surveillance. Thus, a total of 47 (1%) such relapsed cases were found during the period from 1981 to 2000. Reversal reaction was ruled out in all these cases.

In order to understand the profile of the relapsed cases, the 47 cases were analysed with regard to age, sex, type of leprosy, number of lesions, type of lesions, time interval between RFT and relapse, bacteriological status, etc.

Relapse was found both among paucibacillary and multibacillary cases. The majority of the relapse cases were from these with flat lesions. It may be observed that most of the relapsed cases were from the age group of 26 to 45 years at the time of re-registration. There was no case of relapse within 6 months after RFT and a significant proportion of cases relapsed between 6 and 12 months after RFT. It is important to note that nearly a third of the cases relapsed after 36 months and among them, PB and Mb cases were equal. This emphasises the need for a longer watch of the cured cases.

The paper presents detailed discussion on the above findings.

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**Ch 75****MDT IN MB LEPROSY : EVALUATION OF 1 YEAR VERSUS 2 YEARS***Dr.Abbhishek Kumar Jha, Dr.A.K.Jha 'Amar' & Dr.Mathura Prasad Patna Medical College, Patna*

2 years MB MDT has changed global scenario of leprosy. Now it has been seen that as all living bacilli (AFB Leprae) are killed within one year of treatment MDT can be stopped at one year in MB HD. All dead bacilli are removed without treatment and BI becomes zero in due time even after stopping treatment at one year. There are many advantages of stopping the treatment at one year.

8,000 cases of MB Hansen's Disease were randomised in 2 groups :

Group A : 4000 cases WHO MDT for 2 years

Group B : 4000 cases : WHO MB MDT for 1 year

Drop-out : Group A : 50, Group B : 20

Completing T/T A : 3,950; B : 3,980

Cases were evaluated for clinical activities. Bacteriological Index & Morphological Index monthly, follow-up six monthly (A: 5 years, B : 6 years)

At the end of 2 yrs & 6 yrs, cure rates were comparable in both the groups. Relapse rate were equal in both the groups. Side effects were more in group A.

1 year WHO MB MDT in MB Leprosy is better than 2 years MB MDT.

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**Ch 85****A STUDY OF RELAPSED CASES IN SEVAGRAM CONTROL UNIT***A.V.Kale, M.S.Raju & Dr.V.V.Dongre* Gandhi Memorial Leprosy Foundation, Wardha, Maharashtra

Sevagram Leprosy Control Unit has been the first Control Unit in the country, started in 1952. Since then has treated a total of 2011 cases amongst which 62 (3.1%) cases have relapsed. All the cases that exhibited active signs after completion of prescribed treatment as per the particular regimen are treated as relapse on clinical grounds only.

In order to understand the profile of relapsed cases in the control unit, a retrospective analysis of the data of the last 48 years, i.e. since inception till 2000 has been conducted and the results presented in the paper.

The initial observation of the data shows that MDT has brought down the relapse rate from

3.6% to 1.2%, the relapse rates are less among children (2.2%) and females (2.3%). Among those relapsed over the period, 91.9% are from pre MDT era and 8.1% are from MDT era. The data also shows that 10.1% of the cases with 1.0 initial B.I. did relapse, whereas the relapse rate is lesser among the cases with 2+ and above, and still lesser among the -ve cases. The paper also intends to explore association if any, between the relapse and socioeconomic characteristics of the patients.

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**Ch 182****PROFILE OF RELAPSES IN A SELF-DRAWN LEPROSY OUT-PATIENT CLINIC**

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Dhoolpet Leprosy Research Centre is a self referred out-patient research clinic. Over a period of 20 years (1979-1999) 16,745 patients were registered for treatment in the clinic and given monotherapy until 1984 and WHO MDT thereafter. Only cases who had taken either prolonged monotherapy or adequate WHO MDT were considered. Multibacillary relapse was defined as a BI increase 2+. Paucibacillary relapse as new active lesions that were not reactional.

During this period, 14 male patients presented with new lesions. These patients records have been analyzed with regard to their classifications, past treatment and duration & nature of relapse.

Most of the patients were in the age group of 15-45 years; the duration of relapse was >2 years in 74% of the patients (AV 5.5 years). 8 patients (57%) of the patients had taken Dapsone monotherapy in the past; 4 patients (29%) relapsed after completion of a PB MDT course. A proportion of the patients relapsed after having had a combination of Monotherapy follow by either PB or MB MDT. About 1/3rd of the patients had irregular treatment prior to the relapse.

8 patients (57%) relapsed with an identical classification, 4 patients (29%) relapsed with upgrading disease whereas only two patients downgraded on relapse. Histological confirmation of relapse was available in 8 patients (57%). 6 patients who relapsed had a history of reactions (Type I & II) in the past and 5 patients had a reaction during the course of relapse. There were fewer neuritis in the relapsed patients.

We found few true PB relapses. Differentiation of relapse from reaction was frequently difficult. Prospective clinical and histological studies of these post treatment episodes are needed to define diagnostic features and optimum clinical management.

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**Ch 190****EVALUATION OF POST-RELEASED FROM CONTROL MULTI BACILLARY (RFC-MB) LEPROSY PATIENTS IN SATARA DISTRICT**

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MDT Project was started in July 90 in Satara District.

The prevalence rate of leprosy was 61/10,000 population at 1990 and P.R. is 3.2/10,000 population at Dec. 98. There are 2166 MB RFC patients in Satara District at present. Routinely RFC patients are not followed and we do not have knowledge about the present status of RFC patients and his family members.

Therefore, we have decided to evaluate the RFC patients by directly contacting them by NLEP staff, and to collect the information by questionnaire method. The questions considered disease status of patients, their contacts, health consciousness and health education amongst the RFC patients.

We have contacted 960 RFC patients and the study analysis shows that,

1] 99% patients are inactive & 1% RFC patients are having active lesions.

2] The healthy contact have developed PB/MB leprosy disease amongst 17% of family members.

3] RFC patients have received only 6% follow-up during post RFC period

INFERENCE :-1] Healthy contacts of MB patients having more risk of developing disease. Therefore healthy contacts of MB patients must be checked periodically.

2] MB patients should be followed yearly because 1% RFC patients have chance of active lesions.

3] Intensive health education should be given to patients and relatives during the treatment, surveillance and post RFC period which is inadequate.

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**Ch 203****A LONG TERM FOLLOW-UP OF MULTIBACILLARY LEPROSY PATIENTS WITH HIGH****B.I. TREATED WITH WHO MULTIBACILLARY REGIMEN FOR A FIXED DURATION OF TWO YEARS**

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Forty six newly detected previously untreated MB patients with a BI 3 who received MDT for 2 years were followed up for a total duration of 424 person years and a mean duration of

9.26  $\pm$  2.98 years. The BI of the patients continued to fall and all the patients, except one, reached skin smear negativity. MDT was well accepted and well tolerated.

Relapse which was defined as increase in the BI of 1+ or more with or without clinical evidence of activity was diagnosed in only one patient. He was started on a 2nd course of MDT to which he responded favourably. MDT for a fixed duration of two years for MB patients as recommended by WHO is vindicated.

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## Ch 207

### RISK FACTORS PREDISPOSING TO RELAPSE IN LEPROSY : RETROSPECTIVE ANALYSIS OF 78 MB AND 59PB CASES PRESENTING WITH RELAPSE

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A total of 78 MB and 59 PB cases of leprosy, presenting with relapse after the release from treatment, were analyzed with a view to find common risk factors if any associated with relapse. Only cases confirmed as relapses were included in this analysis. Factors analyzed were :

1. Pretreatment clinical presentation to include class and bacteriological status.
2. Type and duration of antileprosy and any other treatment received.
3. History of reaction and neuritis and its management.
4. Concurrent infection/s if any.
5. History of contact past and present.

Forty two (54%) of MB and 29 (49%) of PB cases, had received one of the WHO recommended regimen fixed duration multi drug therapy (FDT). Thirty (38%) MB cases and 25 (42.3%) PB cases had received DDS monotherapy prior to MDT or had extended (>2years) MDT (NON FDT). Six MB and five PB cases had received only monotherapy. Therefore majority of relapse cases were from FDT group. Another important finding was, 29 MB and 23 PB cases had received corticosteroids along with MDT. It was noted that cases receiving corticosteroids as well as FDT had a significantly lower incubation period of relapse (IPR). Combination of FDT and steroids, there was further lowering of IPR suggesting poor killing of *M.leprae* to be the cause of relapse in these cases. On relapse, eighty percent of MB cases and 48% of PB cases scored positive in the mouse foot pad test system, thus establishing the presence of viable *M.leprae*.

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## Ch 331

### THE EFFECTIVENESS OF WHO ONE-YEAR MULTI-DRUG THERAPY FOR MULTIBACILLARY LEPROSY

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The objective of the study was to identify the effectiveness of 1 year multidrug therapy (MDT) for multi-bacillary leprosy patients. The subjects enrolled in the study were leprosy patients, either with a positive bacteriological index (BI), or with a negative BI and more than 5 skin lesions. 49 new cases of leprosy were recruited from four skin clinics in Thailand between 1st January and 31st October, 1998. Each patient was given the MDT (MB) regimen for 12 doses within 18 months. The assessment before starting the treatment included clinical, bacteriological and histological findings. The primary outcome of the assessment at the end of treatment period was clinical inactivity. There were 41 cases who attended the study completely. Thirteen of these (31.7%) were clinically inactive at the end of treatment. All 32 positive BI cases showed a decrease in their bacteriological index. Also, 23 cases whose histological findings were reported showed resolving histology. There were 9 cases (21.9 %) with ENL, 10 cases (24.4 %) with RR and 12 cases (29.3 %) with neuritis. The authors need to follow up the study for a longer period in order to detect any cases of relapse or clinical improvement.

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## Ch 339

### EARLY DETECTION AND MANAGEMENT OF LEPROSY

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Leprosy is a common disease. In this study all patients attending the outpatient department of skin were examined. All the cases of skin discolouration nerve thickening, etc. were taken up for examination and out of a total number of 597 (five hundred ninety seven) cases, a total number of 48 (fourty eight) cases of leprosy detected. In this eight cases belong to SSL group, thirty two cases belong to TT group while only eight cases were of LL group. Period of this study was from June '97 to June 2000.

Management of these cases started immediately after detection of disease and supervisory dosage given according to M.D.T. schedule. Two cases of deformities referred to higher institution for constructive surgery.

All of these patients were called for follow-up at monthly interval and every patient was cooperative enough with the author to take regular M.D.T. schedule. Combination of rehabilitation therapy and occupational therapy were given so the patients could earn their own income and not remain dependent on others. Basic aim is that leprosy patient should have normal social life, proper health & education given.

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## Ch 09

### IS PENTOXIFYLLINE AN ALTERNATIVE DRUG IN THE TREATMENT OF ENL?

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This study (single blind controlled clinical trial) was undertaken to determine whether Pentoxifylline is an alternative therapy for the management of ENL reactions and to study the clinical response in BL and LL patients undergoing acute inflammatory re-actional episodes. According to present knowledge Pentoxifylline (PF) could be useful in ENL reaction because it interferes on the level of TNF factor- $\alpha$  and decreases leukocyte response to IL-1 which are probably associated in the development of ENL reactions.

26 patients (22 M, 4 F) (22 LL, 4BL) suffering from ENL reactions who satisfied the criteria for inclusion and exclusion were randomly allocated to two groups. 13 patients received Prednisolone 30 mg/day and Pentoxifylline 400 mg tid and 13 patients received Prednisolone 30 mg/day and Placebo 1 tid. Both groups received the same dose (30 mg) of Prednisolone which was tapered over a period of four weeks. Pentoxifylline was prescribed for a period of four weeks. The same dosage schedule was followed for placebo group. MDT was continued without alteration in both the groups. Clinical assessment was performed every two weeks for a period of three months. Response to treatment was assessed objectively with the predetermined

clinical parameters and the intensity of the reaction was graded by allotting scores to the severity of the clinical manifestations of the reaction.

8 patients in the trial group needed additional corticosteroids and 10 in the placebo group received additional steroids to control reactional episode. The results are equivocal and will be discussed.

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## Ch 34

### A CRITICAL APPROACH FOR CHEMOTHERAPY IN LEPROSY

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Efficacy of the different therapeutic agents against leprosy bacillus (LB) is assessed either by the results of human trials or effects seen in the mouse footpads (MFP). Various exo-vivo or in vitro substitutes of the in vivo assay procedures have been developed. Essentially, all these methods aim at detecting viability of the leprosy bacilli. However, the greatest snag in most of these methods is an uncertainty that LB is growing in these test systems; if the LB could not grow and actively metabolise test substrates then differences between stationary LB and dead cultures of LB will become negligible and the results of antibiotic susceptibility unreliable. On the other hand, if it is assumed that the LB is growing in these in vitro test systems, then, their in vitro cultivation would also become possible. Unfortunately, it was not. Another limitation of such in vitro methods is failure to take into account the copious production of arthrospores and blastospores by the LB, commonly considered as degenerate cells or non-descript coccoid bodies. Both of these influence antibiotic susceptibility of the LB.

The cultivation of LB in vitro has helped overcome the problems of such assay. Numerous nutritional, enzymological, biochemical, immunological (PGL-I, lepromin), antigenic tissues (mycolates), nucleic acids, molecular-biological characteristics, pathogenicity and all other criteria, had conclusively proved the total identity of the two.

There are some intrinsic limitations of drugs being effective against LB. This is primarily because of presence of blastospores of the LB. These can resist high doses of most of the drugs, and are capable of surviving within the host tissues for very long time as spores. Most drugs, therefore, in effect act as bacterio- (lepro-) static agents even if their general character is as a cidal agent with respect to vegetative cells of lepra bacilli and other bacteria. This explains rapid develop-

ment of drug-resistance with respect to most drugs used now, occurrence of relapse and reversal reactions linked with bacterial growth. These findings inevitably lead to the conclusion that for effective/complete cure of leprosy, sporicidal drugs, singly or in combination should be used.

Present knowledge shows that there are not many successful sporicidal drugs; more over, the spores (blastospores) of LB have many unique characters : these can resist higher temperatures and very high gamma and UV radiations, suggesting that the LB-spore walls may be exceptionally impregnable to noxious agents. In a comparative study of pentavalent antimony viz-a-viz conventional antileprosy drugs, the former showed marked superiority. Results were based on MFP versus in vitro cultures.

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### Ch 38

#### DISTRIBUTION AND RETENTION OF CLOFAZIMINE IN MICE

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Clofazimine (3-(p-chloroanilino)-(p-chlorophenyl)-2,10-dihydro-2-isopropyliminophenazine) is an antinycobacterial agent which has been in use since 1962 in the treatment of leprosy and it is administered orally at doses of up to 300 mg/d in the form of a microcrystalline suspension in an oil-detergent base. In the present study, distribution and deposition of clofazimine in mice has been investigated following administration of the drug with or without Isoniazid (p.o.) for a period of 15-30 days. Clofazimine was administered at a dose of 500 ug (equivalent to 20 mg/kg body weight).

Various tissues (liver, spleen, lung, small intestine, heart, kidneys, muscle, mesenteric fat, lymph nodes, foot pad and nerve) were analysed for clofazimine content. High levels were observed in tissues having reticulo-endothelial components (53 - 263 ug/g wet tissue). In other tissues, the levels were relatively lower. There was a significant amount of the drug in the foot pad and the pooled nerve tissue showed detectable amount of the drug. The pooled plasma presented drug levels of 0.5 - 0.8 ug/ml. Tissue levels were found to be increased with the duration of drug administration.

Simultaneous administration of isoniazid and clofazimine resulted in reduced levels of clofazimine in tissues like small intestine to different extents. The mechanism of the interaction remains unclear and needs to be investigated.

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### Ch 78

#### MANAGEMENT OF TYPE II LEPROSY REACTION - A NEW APPROACH

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Type II reaction in leprosy is not uncommon these days. Traditional method of treating type II reaction in absence of Thalidomide is to continue MB MDT and start with 50 mg. Prednisolone and tapering gradually (every month by 10 mg). This may be good in some cases but most of the cases become worse with this treatment. Clofazimine 300 mg. daily for 1st month followed by 200 mg & 100 mg. in next 2 months along with same regimen of Prednisolone (no other ALT) has been shown to be very much effective in controlling episodes of reaction. 100 cases of Type II lepra reaction were randomized in 2 groups.

A (50) MB MDT 1 year + Prednisolone 50 mg daily tapering (1 yr) by

10 mg every month.

B (50) Clofazimine (100 mg.) 3 x 1 = 1 month, 2 x 1 x 1 month

1 x 1 = 1 month followed by routine MDT for 1 yr + Prednisolone as in group A

Clinical & bacteriological evaluation & cure criteria were as per WHO guidelines.

Recurrence of reaction

Group A - 40 (80%)

Group B - 5 (10%)

If routine WHO MB MDT is withheld for first 3 months and Clofazimine with Prednisolone is given in high doses, reactions of leprosy are controlled in a better way.

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### Ch 90

#### IMMUNOTHERAPY OF LEPROSY : ANALYSIS OF 8-10 YEARS FOLLOW-UP RESULTS

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During the recent years there have been radical changes in the therapy of leprosy. Advent of MDT has changed the outlook completely and from a life long treatment in BL/LL cases, we have reached the stage of fixed duration treatment. While overall results have been good, persisters and resultant relapses in a section of MB cases, persistent clinical activity in PB and continued high incidence rates indicate the need for improvement. With a view to improve the treatment in highly bacillated MB cases, we had initiated immunotherapy trials about 10-12 years back. Highly bacillated BL/LL cases were allocated to three groups. To one group MDT and six monthly intradermal injections of Mycobacterium were administered. To the second group, MDT and BCG was administered using the same protocol whereas the third group received MDT & distilled water placebo and served as control. These patients were monitored clinically, bacteriologically (BI, ATP, mouse foot pad) and histopathologically for histological changes as well as clearance of bacilli and granuloma. Analysis of data at different stages showed clear benefit in terms of enhanced killing and clearance of bacilli as well as faster granuloma clearance. These patients have completed 8-10 years of follow-up. Analysis of these results as well analysis of data from other groups show clear promise to the addition of immunotherapy to MB leprosy. PB cases treated with ultrashort regimens could be other candidates in which immunotherapy need to be tried and followed-up.

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## Ch 101

### MULTICENTRIC CLINICAL TRIAL OF PREDNISOLONE IN THE TREATMENT OF TYPE-1 REACTIONS IN LEPROSY

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Prednisolone has been widely used in the management of Type-1 reactions in leprosy, but its dosage and duration have not been standardized. A randomized double blind controlled clinical trial with continuous enrolment of individuals was carried out in order to assess and compare the feasibility and therapeutic effects of three different regimens of corticosteroids: high dose, low dose and high dose short duration. The treatment duration was 5 months followed by 7 months of surveillance. Recovery of nerve function, recurrence of Type 1 reaction, requirements of additional steroids and long term assessment of physical disability due to Type-1 reaction were the outcome measures. This study was conducted in 6 centres in India and the enrolment of patients began in August 1997. A triple

blind analysis revealed that there were no significant differences especially in terms of additional steroid requirements. There were no adverse side effects warranting withdrawal from the study. Detailed analysis and recommendations are given based on the study results.

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## Ch 107

### EFFICACY OF ROM THERAPY PLUS CONVIT VACCINE IN PB LEPROSY PATIENTS

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The recent WHO multicentric field study on the treatment of paucibacillary leprosy patients with single skin lesion (SSL) by single dose of ROM brought new hope to those who are engaged in the eradication of leprosy from India. Being encouraged by the WHO report, we undertook the present hospital based study. We found that SSL in the PB leprosy patients attending our hospital were morphologically and histopathologically heterogeneous. The histological spectrum ranged from indeterminate through TT to BT leprosy and most patients had BT leprosy. This indicates that the field study of WHO is perhaps different from our hospital based study and hence it is not comparable. Ninety fresh untreated PB leprosy patients with SSL were included in the present study. Children, pregnant women, lactating mothers and patients with any thickening nerves were excluded from the study. All patients were bacteriologically negative but lepromin reactive. The patients were divided into two groups after proper matching for morphology and histological status of SSL. The test group included 60 patients and control group of 30 patients. The test group was given single dose of ROM at start and two injections of low dose Convit vaccine, one at the start and the other at the end of three months. The control group was given only single dose of ROM at the start. Both groups were clinically followed for six months and then retested for histological, bacteriological and lepromin status. Thereafter, they were followed monthly for another six months. In the test group, SSL resolved in 33.4%, regressed in 48.3% and remained active in 11.3% patients while granuloma disappeared in 70% cases. Only one case developed neuritis and in another patient, the disease relapsed. On the other hand, SSL in the control group resolved, regressed and remained active 13.3%, 63.3% and 23.3% cases respectively, while granuloma disappeared in 53.3% cases. In seven patients, the disease course went downhill; of them, two developed neuritis. Thus, the outcome of ROM plus vaccine therapy was marginally superior to that of ROM therapy alone.

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### Ch 159

#### DOES CLOFAZAMINE PROTECT THE DNA DAMAGE INDUCED BY DAPSONE?

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In the present experiment the clastogenic effects of antileprotic drugs (rifampicin, dapsone and clofazimine) used in multi drug therapy (MDT) were studied on mice bone marrow cells and spermatogenic cells. Seven groups of mice were administered with antileprotic drugs (separately and in combination) for 60 days. The dose and the combination of the drugs were selected on the basis of human dosage as recommended by WHO. The administration of drugs adopted the Continuous technique (WHO 1979). Except rifampicin treatment in all other treatment groups, the incidence of chromosomal aberrations (CA) was significant ( $p < 0.01$ ) when compared with controls. Dapsone treatment resulted in higher incidence of CA when compared to the mice treated with rifampicin or clofazimine. The incidence of CA was more in combined drug treatment than in single drug treatment. Similarly R+D treatment resulted in more CA (27.4%) than R+D+C (18.7%) treatment. It is suggested that clofazimine counteract the effect caused by dapsone. It needs further study.

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### Ch 230

#### MULTIPLE DOSE PHARMACOKINETICS OF CLOFAZIMINE

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Clofazimine (3-(p-chloroanilino)-10-(p-chlorophenyl)-2,10-dihydro-2-isopropylimino phenazine) is an effective antileprosy drug. It is a part of the multi drug therapy (MDT) for leprosy and is given at a dose of 50 mg daily. Slow absorption, relatively much slower distribution and longer retention in selective tissues are significant features of clofazimine metabolism. Clinical and other experimental studies conducted at CJIL, Agra and other laboratories have suggested a not-so-linear relationship between the drug dosage and the plasma levels of the drug and so the therapeutic moni-

toring of clofazimine on the basis of plasma levels has not been possible. Further studies conducted in leprosy patients who attended the clinics of CJIL have thrown light on the multiple dose pharmacokinetics of clofazimine. With seven daily doses of 50 mg clofazimine the oral availability of the drug as defined by the area under plasma concentration - time curve (AUC 0-12 h) was 4.40 ug/ml.h while it was 6.8 ug/ml.h after fourteen daily doses. The basal plasma levels were 0.34, 0.52, 0.70 and 0.80 ug/ml respectively after 8, 15, 30 and 60 doses respectively. The peak plasma levels were obtained at & 12 hours after drug intake. Limited studies on the urinary excretion of clofazimine have shown that as much as

0.20 % of the daily dose of the drug was excreted in 24 h in unchanged form. Parallel studies on metabolic disposition of clofazimine in mice have showed that the drug accumulation attained saturation in tissues like fat where the drug remainder dissolved in the fat whereas the drug deposition still continued in other tissues where the drug is deposited as crystals. The findings of this ongoing study and their relevance in the treatment of patients with leprosy will be discussed at length.

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### Ch 344

#### CHEMOTHERAPY OF LEPROSY IN MOROCCO

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After the development of MDT, we have actually entered the era of full-blown leprosy control, having the promising results of this regimen. However, along with the remarkable decrease in the prevalence rate, some anxious subjects have been discussed.

The most arguable point is the terms of chemotherapy; i.e. the current fixed duration of MDT or single dose of ROM without obligatory follow-up after the completion of chemotherapy. Another subject of concern is the definition of MB and PB. Insufficient treatment caused by the misdiagnosis may precipitate relapse.

Through the 3-year study of leprosy control in Morocco, we could learn another alternative strategy to conquer this disease. At present, the prevalence and incidence are well below the global target and we hardly imagine that leprosy was highly endemic in 1980 having the estimated prevalence of 0.75-1.5%. We will present the unique system of leprosy control that brought successful decline of new cases in this country.

The most unique point of Moroccan system is the combination of short-term intensive regimen and sub-



sequent long-term DDS monotherapy. The former is the multidrug regimen (PCT; shown below) for 3 months under perfect observation, and is adapted to both of PB and MB. The latter is monotherapy with DDS for 5 (MB) or 2 (PB) years under self-administration. Two-step strategy,

i.e. intensive killing of pathogen in the early phase and following enough long not-robust but steady chemotherapy serves the requirement of super chronic infectious disease like leprosy. Further, the risk of relapse caused by the miscategorization of MB into PB can be very low.

PCT for 3 months : RFP 900 mg/week

DDS 100 mg, 6/week Clofazimine 100 mg/daily

We will present the prevalence of relapse, leprosy reaction, side effect of chemotherapy, and the transition of bacterial load. The results of laboratory examination will be shown focusing on the prevalence of side effects.

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## Oc 06

### INTRAOCULAR LENS IMPLANTATION IN LEPROSY PATIENTS

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Leprosy affected people, like everyone else, develop cataracts due to various factors - age, diabetes, oral steroid therapy, ocular trauma, chronic ocular inflammation and others. This study reviews our experience with intraocular lens (IOL) implantation in 409 eyes of 335 leprosy patients over 5 years. The purpose of this study is 1. To determine the etiology of cataracts in these patients. 2. To analyse the visual outcome of the surgery. 3. To determine whether the visual outcome of the surgery was affected by pre-existent ocular disease, if any, the type of leprosy, smear status, ongoing anti leprosy treatment. 4. To analyse the post-operative complications. The study concludes that IOL implantation offers the best form of visual rehabilitation for leprosy affected patients when they develop cataracts as it gives very good visual results. The surgery is associated with very few post-operative complications when cataracts are age related. Cases with past history of iridocyclitis however were associated with more intra and post-operative complications. Smear positivity, type of leprosy and anti-leprosy treatment have little effect on the visual outcome of the surgery.

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## Oc 62

### FACIAL PATCHES, TYPE I REACTION AND FACIAL NERVE DAMAGE : A RETROSPECTIVE STUDY AMONG 1178 MB LEPROSY PATIENTS

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We reviewed the charts of 1178 previously registered MB leprosy patients for the presence of facial patches, Type I reaction & facial nerve damage. 735 BB/BL patients (62%) and 443-LL patients (38%) were analyzed separately.

Facial patches were divided into Significant Patches : patches with an estimated diameter of 5cm in the malar area or around the eye and other patches: any patch in other locations or <5 cm. Type I reaction was defined as sudden appearance of red and raised skin lesions. Lagophthalmos was defined as a lid gap of 1 mm on mild closure; recent lagophthalmos as a history of lag of <1 year.

Significant facial patches were present in 9.6% of BB/BL patients and 0.7% of LL patients. Significant facial patches in Type I reaction were present in 44/71 patients (62%). In 1178 patients we identified 47 patients with lagophthalmos (4%): 39 in BB/BL (83%) and 8 in LL (17%). Recent lagophthalmos was present in 18 patients (2.7%): 16 in BB/BL patients (89%) and 2 in it patients (11%). Lagophthalmos of >1 year was present in 29 patients (4.9%): 23 in BB/BL patients (79%) and 6 in LL patients (21%). Majority of the patients (81%) with recent lagophthalmos had a significant patch in the face, with or without accompanying Type I reaction. Only 2 LL patients had a recent lagophthalmos, both had diffusely & infiltrated faces, without patches.

The conclusions of the study are that BB/BL patients are at risk of facial nerve damage when they have facial patches of certain size and location. These observations are similar to our published study in PB leprosy patients and highlights the fact that the operative risk factors for facial nerve damage is the same in PB and MB borderline leprosy. Lagophthalmos in LL is comparatively rare and the mechanism of nerve damage needs to be clarified.

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### Oc 95

#### TEAR FUNCTION TESTS IN LEPROSY

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150 eyes of 75 various types of leprosy patients and an equal number of age, sex matched non-leprosy patients (controls) were examined for tear function tests. There was no statistically significant difference in Schirmers test between leprosy and non-leprosy patients. The tear break up time (BUT) showed a lower value of less than 10 seconds in leprosy patients which was statistically significant [ $p < 0.01$ ]. Leprosy patients with lagophthalmos and decreased corneal sensation showed a lower break up time which was also statistically significant [ $p < 0.01$ ]. It is obvious from this study that proper and prolonged wetting of the cornea is deficient in many leprosy patients even through the quantity of tears produced may not be affected. This can lead to damage of the cornea. There is therefore, an increased role for the application of artificial tear lubricants in the patients.

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### Oc 96

#### INTRAOCULAR LENS IMPLANTATION IN LEPROSY

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A plethora of literature exists detailing the results of intraocular lens (IOL) implantation in patients who underwent extracapsular cataract extraction (ECCE) surgery but very little of it is on intraocular implantation in leprosy patients. We report the results on all leprosy patients who had undergone standard ECCE with IOL implantation from January 1997 to December 1998 in this hospital.

All surgeries were done by the same surgeon using the same technique. 47 eyes of 38 leprosy patients underwent standard extracapsular cataract extraction and intraocular lens (IOL) implantation with a 21 dioptre lens. 16 were males, 22 females. 14 were tuberculoid patients while 24 were lepromatous. Pre-operatively, 5 eyes had lagophthalmos, 4 significant corneal opacities, 4 pterygia and in 15 eyes the corneal sensation was impaired. 28 patients had grade 2 deformity, 2 of them with saddle noses and 19 with claw hands. 4 patients were smear positive at the time of surgery and one had a type I reaction and was on steroid therapy. None of the smear positive patients exhibited significant differences in operative or postoperative compli-

cations when compared with smear negative patient. The patient in reaction had severe postoperative uveitis which needed prolonged treatment with oral and topical steroids. Postoperatively 21% of patients, 3 tuberculoid and 5 lepromatous, developed significant uveitis ( $>2+$  flare and cells) that needed to be treated with steroids. 6 patients, 4 tuberculoid and 2 lepromatous, developed posterior capsular opacities after surgery. Visual restoration in the operated eyes were good.

IOLs are relatively safe and give good visual restoration in all types of leprosy patients operated for cataract. Operative and postoperative complications were not significantly different between lepromatous and tuberculoid patients. We advocate that more ophthalmologists report their experiences with IOLs in leprosy patients so that possible hazards of implanting lenses in vulnerable leprosy eyes are known and more importantly the benefits of IOL are made available to a larger number of patients who need cataract surgery.

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### Oc 176

#### INCIDENCE OF OCULAR MORBIDITY DURING AND AFTER MDT

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Visual impairment and blindness occur in patients with leprosy. Such individuals form a severely disadvantaged group because of other disabilities from the disease. It is currently unclear what role MDT has in preventing or limiting development of ocular pathology. There have been few longitudinal studies undertaken in order to determine the incidence of ocular complications in patients during and after completion of MDT. In this paper the incidence of ocular pathology in 301 newly diagnosed MB leprosy patients was determined and the factors associated with these complications assessed. The study period included the duration of MDT and five years after completion of therapy. Even at the time of registration, one fifth of eyes already had cataract, or corneal and other morbidity. Incidence of ocular morbidity during MDT and RFT revealed that a significant number of patients had various eye complications including impairment of corneal sensation. Results are discussed along with possible associated risk factors.

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**Oc 187****A TWENTY FIVE YEARS RETROGRADE  
AUDIT OF CATARACT SURGERY IN  
LEPROSY SUFFERERS IN EASTERN INDIA**

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**Background :** Cataract is the major cause of blindness amongst the leprosy sufferers in Eastern India. But the visual outcome of the leprosy sufferers following cataract surgery in the pre MDT era was not satisfactory for various post operative complications. Nowadays the successful antieprotic regime and the different potential local antibacterial and anti inflammatory agents have changed the scenario.

**Aim:**The study had been undertaken to evaluate the visual outcome of the different modalities of cataract surgery practised amongst the leprosy sufferers in Eastern India for the last quarter of the past century and the different post operative complications in them.

**Method:** In a hospital based study, this work had been done at the eye clinic of the biggest leprosy hospital in Eastern India from March 2000 to June 2000. Outdoor and indoor aphakic leprosy sufferers were examined at random by refraction, external ocular examination, funduscopy and tonometry. The data were recorded.

**Result:** 134 aphakic RFT leprosy sufferers (MB 95% & PB 5%) with 11 years mean period of interval between cataract surgery and examination showed unilateral surgery in 86 (64%) and bilateral in 48 (36%). The pattern of cataract extraction was Intra Capsular Cataract Extraction (ICCE) -116 (86%), Intra Ocular Lens implantation (IOL) 16 (12%), Needling -1 (1%) and Couching (quackery) in 1 (1%). Amongst 116 ICCE, 92 had complete iridectomy (with inferior or multiple shiacterotomy in 25 cases). The main post operative complications were Phthisis bulbi 6 (4.5%) (unilateral 5 and bilateral 1), Unilateral anterior staphyloma 2 (1%), Unilateral absolute glaucoma in 5 (4%), Blocked pupil 2 (1%), Bullous keratopathy 2 (1%). Associated lesions included aphakia with lagophthalmos in 10 (8%), aphakia with corneal opacity in 11 (9%), aphakia with recurrent uveitis in 8 (6%). The visual outcome in the aphakic eyes were as follows : NPL-13(10%), PL-upto3/60 -8(4%), 3/60->6/60 -3(2%), 6/60->6/18- 75(57%), 6/18 and more- 35(27%).

**Conclusion :** 110 (84%) of aphakic eyes in leprosy sufferers are having good vision. The ICCE with CI and multiple shiacterotomy is the best surgical procedure. The major post operative complications were aphakic glaucoma with bullous keratopathy and phthisis bulbi which have been reduced in recent years following effective regular MDT and local treatment with better antibiotic and anti inflammatory agents. The Intra Ocular Lens Implantation bears a good visual outcome. But the latter needs further follow up for a reasonable period of time.

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**Oc 188****A CURRENT PROFILE OF THE PATTERN OF  
OCULAR LEPROSY IN 'RFT' (RELEASED  
FROM TREATMENT) ERA IN EASTERN  
INDIA**

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**Purpose:** The study was aimed to determine the present situation of the ocular lesions of leprosy in this Released From Treatment (RFT) era when almost 95% of the leprosy patients of Eastern India were released from active antieprotic treatment and enjoying a normal social life. Many of them were still carrying the aftermath of leprosy which in major areas gave rise to high risk eyes.

**Method:** In a hospital based study, this work had been done at the biggest leprosy hospital in Eastern India from January 1999 to June 2000. A random sample of RFT patients attending the eye clinic of the leprosy hospital had been selected and examined by Slit lamp, Ophthalmoscope, Tonometer and Retinoscope with Trial set. The data was recorded and analysed.

**Result:** A total number of 270 RFT leprosy sufferers (MB 90% & PB 10%) showed the following pattern of ocular lesions - Lid affection 48 (17.5%), Corneal lesions 42 (16%), Uveitis and its sequele 39 (15%), Senile cataract 173 (64%), Complicated cataract 15 (5%), Glaucoma 9 (2.5%) and Phthisis bulbi 12 (4.5%). Of the senile cataract - mature cataract 25 (10%), unilateral aphakia 56 (20%), bilateral aphakia in 19 (7%) and pseudophakia amongst 16 (5.5%) cases. 21 cases (8%) of the study group were blind (no perception of light) in one eye and 5 (2%) cases in both eyes. 99% of the study group had deformities of the extremities and 85.5% of them had bad ocular hygiene due to mutilated hands.

**Conclusion :** Today cataract, lagophthalmos, corneal opacity are the main blinding problems in ocular leprosy. The cataract in leprosy is now carrying an excellent outcome following surgery even with Intra Ocular Lens Implantation. Lid surgery for lagophthalmos is found beneficial amongst two third of the cases. But corneal and uveal problems are still blinding in this zone due to negligence and lack of maintenance of proper ocular hygiene on the part of the patient and timely intervention by appropriate eye health care delivery system.

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### Oc 237

#### EYE CARE AMONG LEPROSY PATIENTS IN THE COMMUNITY

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Eye complications leading to ocular morbidity and blindness are common in leprosy. As many of these complications can be prevented and a specialist is not always accessible, it is important that patients realize that blindness and injury can be prevented by their own actions. Few studies that have looked at knowledge of eye care among leprosy patients. We interviewed 130 leprosy patients using a questionnaire in the out-patients and admitted in the wards and present our findings here.

97 of the patients interviewed were males and 33 females. 70 patients belonged to the lepromatous group and 60 to the tuberculoid group, 89 patients had eye complications while 41 patients had no eye complications.

Although general knowledge on leprosy was good, eye care knowledge was poor. Mean scores for general leprosy knowledge was 58% while eye care knowledge was only 15%. When the level of eye care knowledge is found to be dismally poor even in a hospital based population of leprosy patients, the majority of whom had ocular complications, the great need for intensive health education in the area cannot be over emphasized.

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### Oc 339

#### COMBINED SURGICAL TREATMENT OF LAGOPHTHALMOS AND ECTROPION IN LEPROSY

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Paralytic lagophthalmos and ectropion by leprosy are serious complications of facial paralysis, which may lead to exposure keratitis, corneal ulceration, and further lead to blindness. Gold implantation in the upper

eyelid and cartilage graft in the lower eyelid, with optional horizontal shortening, successfully corrected the lagophthalmos and ectropion since 1992 over 150 cases.

The improvements made to lid loading with gold include four holes for better fixation, reducing the weight of gold to one gram, and redesigning the shape to be crescent curved and oval surfaced to conform to the shapes of both the eyeball and eyelid.

We have now found that raising the level of the lower lid margin to the sclera is important in concealing the scleral show due to drooping of the lower lid. We grafted conchal cartilage in a 5 x 35 mm sized band, which was fixed at the medial and lateral canthal area in 57 patients during the recent 3 years.

Combination treatment provided for near normal eye closure and aesthetically pleasing appearance without the drawbacks associated with other methods such as eye clenching in concert with mouth closure, donor site deformities resulting from temporalis muscle transfer, and over exposure of carbuncle due to stretching effects of lateral canthoplasty.

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### Oc 392

#### THE PREVALENCE OF BLINDNESS IN LEPROSY

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Sight threatening complications of leprosy include corneal scarring to corneal anaesthesia associated with inadequate eyelid closure, chronic iridocyclitis, and progressive cataract. The insidious onset of these conditions can lead to progressive visual impairment being identified only when advanced. Recognition of these disorders at an early stage can lead to treatment which prevents blindness. Our aim in conducting the present study is to identify the prevalence and causes of blindness in leprosy affected people in W. Bengal and Bihar, India.

The results reveal an unexpectedly high prevalence of blindness in the Jhalda subjects, as compared to those in the other two centres. However, significantly more subjects with multibacillary disease were found in the Jhalda sample than in the Muzaffarpur or the Saldoha samples. Looking at those identified as blind in Jhalda, significant risk factors for blindness include multibacillary disease, and duration of disease >10 years. The known prevalence of blindness in the general population in that region is 0.6% (WHO-IND.2).



Our study suggests that emphasis must still be placed on instituting adequate measures for early detection of ocular complications of leprosy, particularly where there is, or has been, a high prevalence of multibacillary leprosy. Continuing care of treated patients is required to prevent blinding complications of established ocular impairments such as corneal anaesthesia and inadequate eyelid closure. Other epidemiological factors which may contribute to the high prevalence of blindness in the Jhalda study group will be discussed.

This study provides evidence that in leprosy, particularly of multibacillary type, blindness remains a significant risk which requires to be addressed in all leprosy control and treatment programmes.

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## Ne 127

### MECHANISM OF NERVE DAMAGE IN LEPROSY

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Nerve damage leading to impairment and permanent disability is still the major problem in the course of a leprosy infection. This nerve damage may occur before, during and after anti-mycobacterial treatment, especially during so called reactional episodes. Two types of nerve damaging immunological reactions are recognised, the reversal reaction (RR) or type-1 reaction and the erythema nodosum leprosum (ENL) or type-2 reaction. The immunological and pathophysiological mechanisms behind the reaction will be discussed. This will include recognition of *M. leprae* antigenic determinants on bacilli and self antigens, cytokines among which TNF- $\alpha$  and adhesion molecules like N-Cam. Silent neuritis (nerve damage) will be included.

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## Ne 167

### IMMUNOLOGICAL STUDIES IN LEPROUS NEURITIS

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Immune complexes were found raised in a sequential study both in B.T and LL groups of patients with reduced complement mediated solubilization (Ramanathan et al, 1998). Since painful neuritis is an important problem in leprosy, a histoimmunological

study on 30 nerve biopsies of patients with neuritis was carried out (Ramanathan et al, 1989). Immunoglobulins and complement were detected in a proportion of cases and mycobacterial antigen even in the absence of intact bacilli. In an ongoing study, 103 leprosy patients and 14 healthy normal individuals were investigated for serum anticardiolipin IgM and IgG antibodies. The patients belonged to three groups, namely A. patients with painful neuritis, B. patients who had been treated for neuritis, C. patients without painful neuritis.

Antibodies to ceramides were significantly raised in all groups of patients. IgG antibodies were raised in large number of A and B groups. IgG antibodies are involved in autoimmune disorders. A number of investigators have suggested that auto-immunity may have a role in Leprous neuropathy which our studies also indicate.

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## Ne 204

### ALTERATIONS IN AXONAL NEUROFILAMENT PROTEIN AND SILENT NERVE DAMAGE IN LEPROSY

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Through morphological studies it was firmly established that a reduction in axonal caliber (atrophy) precede demyelination leading to conduction block and is the manner in which silent nerve damage occur in leprosy. We have sought to study the biochemical basis of atrophic changes in leprosy nerves. The study was planned with following 4 objectives based on the assumption that the axonal caliber is governed by the carboxy terminal phosphorylation of high molecular weight neurofilament protein (NFH).

1. Study through immunocytochemistry the state of NF phosphorylation in the affected peripheral nerves in leprosy.

2. To correlate the morphological and immunocytochemical changes.

3. To demonstrate the presence of altered phosphorylated form of NFH.

4. Biochemical correlates of NF phosphorylation by quantifying the enzyme(s) which regulate the phosphorylation on carboxy terminal region.

The study was carried out in a total of 22 leprosy and 4 normal human peripheral nerves and in the experimental mouse sciatic nerve model for leprosy. The results

explicitly demonstrate both morphological and biochemical evidence of alteration in NFs. There was hypophosphorylation of NFs, prior to atrophy, was demonstrated using SMI-31 antibody, that specifically binds to phosphorylated - COOH terminal of NFH and NFM. Antigens of

M.leprae seem to play a crucial and specific role in the sequence of events. However there was no CDK5 activity detected in both normal and leprosy peripheral nerve supernates, indicating that, other kinases may be involved.

Acknowledgement : This study was funded by Department of Science and Technology, Govt. of India and Ms. M.P. Save is the recipient of Lady Tata Memorial Trust Fellowship.

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## Ne 264

### RETROSPECTIVE STUDY ON DAMAGE OF THE LOWER EXTREMITIES NERVES AND THEIR BRANCHES IN LEPROSY

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Objective : To study the incidence and clinical feature of n.tibialis, n.peroneus communis and their branches damage in leprosy.

Methods : Examine 275 cured patients carefully including 63 hospitalized cases and 212 cases living in communities.

Results : The damage incidence of the lower-limb nerves was 65.45%(180/275) in cases or

53.09% (292/550) in nerves. The tibial nerve damage incidence was 54.18% (149/275) or 43.64% (240/550). The damage incidence of tibial nerve branches were in muscularis popliteal fossa and leg of 1.82% (5/275) or 1.09% (6/550), n.cutaneous surae medialis of 22.18% (61/275) or 17.09% (94/550), n.calcanealis of 38.91% (107/275) or 30.55% (168/550), n.plantaris medialis of 44% (121/275) or 35.27% (194/550) and n.plantaris lateralis of 45.82% (126/275) or 36.91% (203/550) respectively. The damage incidence of n.peroneus communis was 59.27% (163/275) or

46.18% (254/550) and its branches were n.cutaneous surae lateralis 41.45% (114/275) or 30.55% (168/550), n.peroneus superficialis of 52.36% (144/275) or 39.64% (218/550) and n.peroneus profundus 44.36% (122/275) or 33.45% (184/550) respectively. The damage of lower limb nerves is related to

leprosy type and diseased duration, which characterized with more sense impairment and motor impairment secondly.

Conclusion : The damage of lower limb nerves was most frequent and useful to diagnosis, classification and finding risk nerve through its clinical symptoms. Authors considered that the early case-finding, early diagnosis and early treatment be the most important measures to control disability.

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## Ne 291

### TRIPOD TRIAL - PROPHYLACTIC USE OF PREDNISOLONE, RESULTS AT 4 & 6 MONTHS

**Alison M.Anderson**, Pokhara, Nepal

The TRIPOD trial is a double blind, placebo controlled, multi-centre trial of the use of Prednisolone in three aspects of leprosy treatment - prophylactic use for the prevention of nerve function impairment, treatment of early sensory nerve function impairment and treatment of longstanding nerve function impairment. First results are available for the part of the trial looking at prophylactic use of Prednisolone.

DESIGN - Six centres in two countries (Bangladesh and Nepal) recruited over 600 newly diagnosed MB patients to the trial. Patients had either no detectable nerve function impairment or pre-existing nerve function impairment of duration greater than six months. Other entry restrictions also applied. Half received Prednisolone and half an identical placebo tablet. All centre staff- including prescribing paramedics, physio-technicians monitoring patients and the supervising medical staff were blind to the type of tablet used for each patient. Informed consent was received for each patient entering the trial.

PROTOCOL - Prednisolone/placebo was given as a 20 mg daily dose for 3 months, with a tapering dose in the 4th month.

FOLLOW UP - Patients returned, or were traced, for follow up at 1,2,3,4,6,9,&12 months. A late follow up at 24 months will assess the incidence of TB in the two groups.

OUTCOME MEASURES - At each follow up, the patients were assessed for nerve function impairment by sensory testing with graded mono-filaments, voluntary muscle testing and assessment of nerve tenderness. Fixed criteria were applied for the diagnosis of nerve function impairment and removal of a patient from the trial. Potential side effects were checked according to a fixed protocol. Presence of severe side effects also resulted in exit from the trial.

RESULTS - Results are available for patients at 4



months (the time of cessation of prophylactic treatment) and at 6 months.

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## Ne 293

### SENSIBLE MANUAL MUSCLE STRENGTH TESTING TO EVALUATE MOTOR FUNCTION

*J. W. Brandsm*, Pokhara, Nepal

Manual muscle strength testing is an established assessment technique to evaluate and monitor motor nerve function impairment (NFI). There is little consensus about important aspects that relate to motor function assessment. Knowledge of these may lead to uniformity in assessment and recording. Uniformity in assessment and recording will facilitate comparison and analysis of data. These aspects will be discussed under 4 headings: Why nerve function assessment, when, by whom and what detail?

Furthermore, information about the reliability of motor function assessment will be given and areas for further research will be indicated.

It is now an established practice to assess nerve function of all suspected and new patients to evaluate if, and to what extent, nerve function may be impaired. Nerve function should be assessed at the time of diagnosis, monthly thereafter, and every time a patient complains about nerve discomfort (pain), and (new) weakness or numbness. Assessment frequency should be increased when there is acute nerve function loss. Each person involved in the diagnosis and treatment of nerve function loss should know how to assess nerve function.

Detail of assessment needed depends on the preliminary findings of motor assessment, the possibility to isolate muscles, biomechanics of the hand and expertise of the examiner.

Few studies have reported about the reliability of muscle testing in leprosy. (Inter) tester reliability is influenced by skill of examiners and availability of, and adherence to, muscle testing protocol. It is also influenced by the number of tests and detail of grading.

More research is needed into the (inter)reliability of manual muscle testing. Additional research is needed to establish to what extent other manual muscle strength testing techniques can be of value in assessing and monitoring motor nerve function in leprosy patients.

A chart to assess and evaluate motor function that allows for simple and detailed assessment and recording will be presented.

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## Ne 366

### A SIMPLE RULE TO PREDICT NERVE FUNCTION IMPAIRMENT

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**Background :** Nerve-function impairment (NFI) commonly occurs during or after chemotherapy in leprosy. The data arising from the Bangladesh Acute Nerve Damage Study, a prospective study based on the DBLM project in Nilphamari, Bangladesh, have allowed us to describe the development of NFI and to develop a simple clinical prediction rule for estimating the risk of NFI occurrence.

**Methods :** New leprosy cases (MBs and PBs) were recruited and followed up for 2 years in a field setting. We used multivariable regression analysis by Cox's proportional hazards model to identify predictive variables for NFI. Discriminative ability was measured by a concordance statistic. Internal validity was assessed with bootstrap re-sampling techniques.

**Findings :** Amongst 2510 patients, 166 developed new or further NFI during the first 2 years of follow-up. A simple model was developed with leprosy group (either paucibacillary leprosy [PB] or multibacillary leprosy [MB] and the presence of any nerve-function loss at registration as predictive variables. Patients with PB leprosy and no nerve-function loss had a

1.3% (95% CI 0.8-1.8%) risk of developing NFI within 2 years of registration; patients with PB leprosy and nerve-function loss, or patients with MB leprosy and no nerve-function loss had a 16.0% (12-20%) risk; and patients with MB leprosy with nerve-function loss had a 65% (56-73%) risk.

**Interpretation :** Our prediction rule can be used to plan surveillance of new leprosy patients. Patients at low risk of NFI may need no follow-up beyond their course of chemotherapy (6 months); patients with intermediate risk need a minimum of 1 year of surveillance; and patients with high risk should have at least 2 years of surveillance for new NFI. Current recommendations for surveillance of patients with leprosy (for the duration of chemotherapy only) exclude an important group of patients who are at risk of developing NFI after completion of treatment.

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**Ne 367****PREVENTING NERVE DAMAGE - A STRATEGIC REVIEW Smith W.C.S.**

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**Introduction :** Nerve damage, and the consequences of nerve damage, sets leprosy apart from other diseases. The irreversible motor and sensory impairments caused by leprosy lead to increasing secondary impairments long after the disease process has been arrested. Interventions that prevent, reverse or limit the impairments due to leprosy are therefore of the greatest priority. This review addresses the question of priorities for both research and service provision given limited resources.

**Methods :** The current research efforts are reviewed in terms of their likelihood of delivering significant health gain in the short and long term. Interventions to prevent nerve damage are reviewed in terms of the effectiveness, feasibility in primary care settings and cost.

**Results :** The majority of nerve damage occurs prior to diagnosis and efforts to improve early diagnosis and treatment have great potential for preventing nerve damage. Prophylaxis using steroids may be cost effective when targeted to groups at highest risk. Simple means of identifying those at high risk are important. Treatment of acute episodes of nerve damage and reactions is less than satisfactory since not all cases present for treatment and treatment is not always successful. Self-care has been demonstrated to be an effective means of preventing secondary tissue damage but now needs to be developed for implementation within basic health care. Although the benefit may be limited, it may, along with re-constructive surgery, be one of the few approaches open for those who have completed MDT.

**Conclusions :** Early case detection and MDT treatment is the most cost effective means of preventing nerve damage and the size of the potential benefit is large - this is a priority for research and interventions. Treatment of acute reactions remains a challenge while steroid prophylaxis, if effective, may offer considerable benefit when targeted to those most at risk. Self care has been shown to be effective and may, along with re-constructive surgery, be one of the few approaches available for those who have completed MDT.

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**Ne 390****CAN RISK FACTORS IN LEPROSY BE IDENTIFIED BEFORE THEY BECOME OPERATIVE?**

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Risk factors in leprosy are defined as factors responsible for reversible and irreversible nerve function impairment (NFI) leading to disability and deformity. 87 patients were inducted into a double blind clinical trial of prednisolone therapy in Type 1 reactions. It was observed that some patients developed recurrence of reactions and hence required an additional course of steroids. Inflation observed in skin lesions may indicate simultaneous sub-clinical inflammation in the nerves endangering their functional integrity. In addition, episodes of nerve inflammation can occur without skin manifestations. Identifying these phenomena through other parameters can help to selectively give higher dose or longer duration of steroids in this special group of patients. In this study, patients needing additional steroids were identified and compared with those not requiring additional steroids using a pre-determined clinical scoring method, scores being allotted to each known risk factor. Some of the known risk factors suggested for the development of Type 1 reaction and/or NFI include face patch, extent of disease, duration of disease, borderline type of disease, nerve involvement, history of reaction, duration of treatment and bacteriological positivity. Despite all the available information, there is as yet no simple test available to predict risk factor responsible for NFI. If risk factors are identified and recognised at the start of chemotherapy, adding a suitable dose of steroids along with MDT would prevent nerve damage/protect the nerve. We describe here a simple and reliable clinical scoring method to estimate the risk of development of NFI before starting chemotherapy. In this paper we recommend the use of a clinical scoring model to predict early NFI which can be used to assign patients into high risk group and plan active intervention and follow up.

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**Im 104****MALARIA, LEPROSY AND MULTI-DRUG THERAPY CONTAINING DAILY 100 MG DAPSONE**

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Sulphonamides and sulphones are known to have anti-malarial activity. To test this, we carried out serological as well as parasitaemia assessments on 322 lepromatous leprosy patients receiving 100 mg. dapsone daily and 669 healthy subjects, living in three different districts of India, endemic for leprosy as well as malaria. Blood smears from 124 lepromatous patients with fever and 379 afebrile control subjects showed that the prevalence of malaria parasitaemia in both the groups was similar and varied from 25% to 30%.



However, the lepromatous patients had only *P. vivax* malaria; on the other hand normal controls had both *P. vivax* and *P. falciparum* infections. The ratio of the two plasmodia species in them was 9:1.

Of the 201 afebrile healthy controls, none showed parasitaemia, but 2 of the 40 afebrile lepromatous patients showed *P. vivax* in their blood smears. This perhaps indicated a balance between parasite survival and host immunity. Humoral antibody response was studied by IFA test in 158 afebrile lepromatous patients and 89 healthy subjects which showed humoral immune response in 19% leprosy patients and 3% control subjects. This difference might be explained by the over-active Th-2 lymphocytes in lepromatous leprosy patients with consequent anti-malaria antibody production following repeated infections.

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### Im 122

#### SOLUBLE ICAM I AND sVCAM I IN SERA OF LEPROSY PATIENTS WITH REACTIONS

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Expression of costimulatory molecules on antigen presenting cells is one of the essential signals for activation of T lymphocytes and ultimately for an effective immune response. Soluble form of these costimulatory or adhesion molecules are released upon cytokine stimulation and can be detected in the circulation. Soluble ICAM I is reported during inflammatory conditions such as in bronchial asthma and elevated in rheumatoid arthritis(RA) compared to healthy controls. Though a few reports are there regarding sICAM I in leprosy, not much is known about soluble adhesion molecules in leprosy reactions. Reactions are clinical episodes associated with tissue damage (reversal reactions) and with systemic involvement (erythema nodosum leprosum). Since reactions further complicate the disease process and about 30 % of leprosy patients suffer from these complications we have attempted to understand the immunological phenomenon prevailing during reactions. Antibody response (total IgG and IgG subclasses) and proliferative response to different antigens of *M. leprae* (MLSA, PGL, LAM, ML 65kDa, ML 28kDa and ML 18kDa) were analysed earlier. In this study we have estimated the soluble form of ICAM I in sera of 25 leprosy patients with ENL reactions, 14 patients with reversal reactions, 14 patients without reactions (4 TT/BT, 10 BL/LL) and 6 healthy individuals. Soluble VCAM I molecule was estimated in sera of 35 ENL, 7 RR, 9 patients without reactions (7 BL/LL, 2 TT/BT) and 6 healthy individuals. The quantitative sandwich ELISA was employed for estimation of these molecules. Soluble ICAM I is found to be significantly elevated in reversal reactional patients

compared to healthy individuals. Soluble VCAM I is significantly in higher level in ENL patients in comparison to reversal reactional patients.

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### Im 137

#### DETECTION OF DISEASE RELATED IMMUNE COMPLEXES IN THE SERUM OF LEPROSY PATIENTS

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*Mycobacterium leprae* antigen and antibody complexes could be detected in the serum of leprosy patients using monoclonal antibody ML-34 and anti-BCG antibodies by enzyme linked immunosorbent assay. This simplified system detects disease related complexes without the need for isolating and purifying them from the serum. Immune complexes captured using monoclonal antibody ML34 revealed positivity in 7 out of 8 neuritic, 2 out of 9 tuberculoid (TT), 5 out of 10 borderline tuberculoid (BT), 4 out of 10 borderline lepromatous (BL), and 4 out of 10 lepromatous (LL) leprosy cases. One of the controls also showed immune complex of an IgM type. Anti-BCG based IgG immune complex assay revealed positivity in 6 out of 8 neuritic, 1 out of 9 TT, 4 out of 10 BT, 2 out of 10 BL, 4 out of 10 LL leprosy cases and 2 out of 24 healthy controls. IgM type of Mycobacterial immune complexes were almost negligible. Capture of complexes using monoclonal antibody ML34 which is against lipoarabinomannan of *M. leprae* seems to work better than polyclonal anti-BCG antibody. The above test would be useful in Immunodiagnosis of neuritic leprosy and also in cases where antibody response is not detectable because of the formation of immune complexes.

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### Im 196

#### LOCAL IMMUNITY IN LEPROSY - A COMPLEX PROFILE

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Several specific tests were developed for the diagnosis of leprosy. Out of all these tests PGL-I antibody and 35-kD antibody based assays were found to be most

useful in diagnosing leprosy cases. Using these assays about 90-100 percent cases of lepromatous (BL/LL) leprosy and 40-60% of tuberculoid (TT/BT) cases were detectable. It was noted that about 40% of TT/BT cases did not show any antibody level in serum even against whole *M. leprae* indicating that there is no significant B cell stimulation for antibody production against *M. leprae*. Therefore in the present study, an attempt has been made to understand the local immune response in the lesions of TT/BT cases. It was noted from oragnotypic cultures of skin lesions that locally many of the TT/BT lesions secrete antibody against *M. leprae*. Further, it was noted that these lesions secrete both IFN- $\gamma$  and IL-4 at the same level indicating both Th1 and Th2 type of response in the same lesion. Further study using phenotypic markers indicated that in addition to CD4+, CD8+ T cells and macrophages many of the TT/BT lesions show the presence of B cells/ plasma cells which are responsible for a local antibody response. The present findings strongly suggest that Th2 response in these lesions is probably playing a significant role in dampening the Th1 response thus allowing the lesion to linger for a long time in the skin.

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### Im 311

#### CYTOKINE LEVELS IN TYPE 1 REACTIONS AND THEIR RELATION TO NERVE DAMAGE AND THE RECURRENCE OF REACTION

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Type I Reaction (T1R) occurs in 30% of borderline leprosy patients and is a major cause of nerve damage which leads to disability and deformity. Although T1R reactions usually improve with steroid treatments, the biological basis of T1R is poorly understood. We have measured leprosy specific antigen-induced levels of IFN- $\gamma$ , TNF- $\alpha$  and IL-10 in a 24 hour whole blood assay, in T1R patients before, during and after prednisone treatment.

The levels of these cytokines were significantly increased when compared with age, sex and class matched borderline leprosy patients without T1R. Steroid treatment lowered levels of the IFN- $\gamma$ , but levels of TNF- $\alpha$  increased as the doses of steroids were lowered. IL-10 levels increased during steroid therapy. High TNF- $\alpha$  levels in untreated patients (higher than 75th percentile, > 9400 pg/ml) was associated with a 5 times greater risk of reactivation of symptoms during treatment phase. High levels of TNF- $\alpha$ , after 2-4 weeks of steroid treatment were associated with a three to five

times greater risk of nerve function, impairment or failure to improve nerve function. The same patients were also at 3 times greater risk of another T1R episode within 2 months of completing treatment. This study for the first time links inflammatory cytokine levels with nerve function impairment in T1R and offers a means to identify patients failing to respond adequately to steroid therapy.

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### Im 380

#### WEB SITE : LEPROSY RESEARCH SUPPORT : NIH, NIAID CONTRACT NO.1 AI-55262 AT COLORADO STATE UNIVERSITY

**Delphi Chatterjee & Patrick J. Brennan**, Colorado State University, USA

We have recently developed a WEB SITE for our National Institute of Allergy and Infectious Diseases (National Institutes of Health)-supported Leprosy Contract with the following address:

<http://www.cvmb.colostate.edu/microbiology/leprosy/>

The WEB SITE is divided into seven sections : Global Leprosy; Materials Available; Skin Testing; Request for Research Materials; Material Transfer Agreement; Contacts and Lab Personnel; and Links. Under Global Leprosy, the history of this NIH Contract, since its inception in 1978, is traced and its contributions to leprosy research are delineated. There are also segments on leprosy as it was, as it is today, and the continuing need for leprosy research and central resources. The Materials Available are listed and described, including whole

*M. leprae*, its fractions, individual proteins (native and recombinant), carbohydrates, lipids, including PGL-I and synthetic surrogates, monoclonal and polyclonal antibodies, etc. This section is supported by an experimental description of the products.

Under Skin Test Initiative, we describe the preparation of two new skin-test antigens under prescribed conditions. The composition, quality control, and efficacy in guinea pigs of these products are demonstrated with attractive graphics. The button used is Skin Testing which opens with a depiction of a Himalayan background in Nepal where the Phase II Human Study is being conducted at Anandaban Leprosy Hospital. The results of the Phase I trial on human volunteers in Fort Collins are summarized, and results from Phase II will be posted when completed.

The WEB SITE has a Leprosy Research Materials Order Form and a copy of the Biological Material Trans-



fer Agreement which must be duly completed and signed by any new investigator and a representative of her/his institute prior to the shipping of requested materials. This is a very attractive, user-friendly, and professional WEB SITE with illustrations and photographs, such that you have full information on products and the people helping you. We suggest that you Bookmark the SITE, so that you do not have to type the address each time.

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### Im 382

#### IMMUNISATION AGAINST MYCOBACTERIUM LEPRAE INFECTION WITH DNA VACCINES

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The continuing detection of new leprosy cases indicates that transmission of *M. leprae* will continue to occur for some time. A combination of effective anti-microbial therapy of active cases and immunisation in endemic regions may be the most effective long term control measures leading to eradication of leprosy. Immunisation with *M. bovis* (BCG) is partially effective against *M. leprae* infection, however there is considerable interest in developing new subunit vaccines against tuberculosis, including DNA vaccines. Therefore we have investigated the effects of DNA plasmids as vaccines against leprosy infection. Initially we selected the immunodominant 35 kDa protein of *M. leprae* as the candidate antigen, as it is recognised by more than 90% of leprosy patients, with tuberculoid patients mounting a strong T cell response and lepromatous patients an antibody response. The gene for the 35 kDa protein is present in

*M. leprae* and *M. avium*, but not in members of the *M. tuberculosis* complex. DNA vaccine expressing the *M. avium* 35 kDa protein protected inbred mice against virulent *M. avium* infection, with greater efficacy than BCG at 4 weeks post-challenge. We then established that DNA expressing the *M. leprae* 35 kDa (DNA-ML35) stimulated specific IFN- $\gamma$  T cell and antibody responses in outbred Swiss Albino mice. When challenged with viable *M. leprae* in the footpad, DNA-ML35-immunised mice showed significant re-

duction in mycobacterial replication, with equivalent protection to that induced by BCG immunisation. Mice immunised with DNA expressing the dominant *M. tuberculosis* Antigen 85B, which induces significant protection against murine pulmonary tuberculosis, also showed reduced growth of *M. leprae*. We are currently investigating ways of enhancing the protective effect of DNA vaccines against *M. leprae* infection. These results suggest that effective subunit vaccines can be developed against leprosy infection.

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### Im 420

#### CORRELATION BETWEEN CO-STIMULATORY MOLECULES AND T-CELL STIMULATION IN ANERZISED LYMPHOCYTES OF LEPROSY PATIENTS

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The causative agent of leprosy, *M. leprae* resides and multiplies within the macrophages and hence escapes the host immunity. Cell mediated immunity (CMI) plays a vital role as evidenced by BT/IT patients having high CMI and strikingly low CMI in BL/LL patients. CMI in leprosy is an enigma because it acts like a double edged sword by protecting and limiting the bacillary growth on one side and on the other hand leading to severe pathology, if turned on improperly.

Most of the invitro proliferative responses to our knowledge were done by presenting the antigen in soluble form. We believe that *M. leprae* reactive T cells do exist in leprosy patients but at a low frequency which can be stimulated under appropriate conditions. Hence in the present study, we attempted to restore the CMI in the anergic T cells of lepromatous leprosy patients through immuno-manipulation thereby presenting the antigen in particulate form and combinations Ag, Ag+MDP, Ag+MDP+Trat encapsulated in liposomes or delivered in medium were studied. PBMC's of normal, BT/TT and BL/LL were stimulated either with antigen alone or in combination of the above formulations in liposomes or in medium Ag+MDP, Ag+MDP+Trat in liposomes showed very high stimulation index compared to antigen delivered in soluble form. The results were more or less similar with all the five antigens. The culture supernatants of the above assays collected on the 5th day were studied to measure IFN- $\gamma$ , IL-2, IL-4 & IL-10 levels for assessing the CD4+, Th1 and Th2 dichotomy. IFN- $\gamma$  (2000-9000 pg/ml) and IL-2 (40-200 pg/ml) were significantly high in liposomal formulations as compared to the antigen delivered in soluble form with BT/TT having highest levels fol-

lowed by BL/LL and normal individuals. Since IL-2 mRNA has short half life, we have measured IL-2 levels at different time points viz. 24 hrs, 48 hrs, 72 hrs and 120 hrs. Peak levels were observed after 24 hrs of stimulations. IL-4 (30-50 pg/ml) and IL-10 (200-700 pg/ml) were significantly lower confirming a shift from Th2 to Th1 kind of response by this approach. There was no significant difference between the liposomal and the soluble forms as far as these two cytokines are concerned. BL/LL had slightly higher values than BT/LL followed by normal individuals.

The study highlights the reversal of anergic T lymphocytes to through modifying antigen presentation using some potential T cell adjuvants. Direct correlation between T cell proliferation response and lymphokine production vis a vis the role of costimulatory molecules on APC and T cells will be discussed among these patients of spectrum of the disease.

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### Im 71

#### ENHANCEMENT OF CMI IN LEPROMATOUS PATIENTS ON MDT RECEIVING HERBAL MEDICINES

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In recent years successful use of herbal medicines to treat well known diseases has been demonstrated by many workers. There is report from Chennai by Prof.Deivanayagam et al demonstrating improvement of CMI status of HIV / AIDS patients following treatment with certain herbal medicines. Therefore a drug trial in lepromatous leprosy patients using known CMI potentiating herbal medicines supplementing fixed duration multidrug therapy for a period of 12 months was conducted. The morning dose of herbal drugs will contain 1) *Tinospora cardifolia* 2) *Terminobia chebula* 3) *Emblico officinosis*. The evening dose will contain

4) *Whitonia somnifera* 5) *Spirulina* - an algae 6) *Asperagus*. Ten untreated patients having a bacterial index over 3+ were selected. Of them 5 were randomly allotted to a group which in addition to MDT received immunopotentiating herbal medicines for a period of 6 months. The other group receiving only MDT served as controls. An initial clinical examination, skin biopsy, skin smears and lepromin tests were done in addition to the routine blood tests before starting treatment. The tests will be repeated every 3 months until the completion of treatment at 12 months, all of them will be carefully followed for reactions, neuritis and other complications. The results of the study will be presented and discussed.

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### Im 81

#### IMMUNOLOGICAL PROFILE OF TREATED LONG SMEAR NEGATIVE LEPROMATOUS LEPROSY PATIENTS

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Lepromatous leprosy patients show suppressed cell mediated immune response (CMI) to

*M.leprae* whereas their humoral response is rather elevated. After clearance of bacilli following treatment upregulation of antigen specific CMI is expected. Therefore we have undertaken this study to assess the immune response of lepromatous leprosy patients who have become smear negative following treatment and have remained negative over period of time. CMI response by lymphocyte transformation test (LTT), lepromin delayed type hypersensitivity response (DTH), antibody response to 35kD antigen by serum antibody competition test (SACT) and PGL-I of *M.leprae* by ELISA, IgG subclasses to *M.leprae* and IFN, IL-2, IL-4, IL-10, IL-12 and TGF production in cell culture supernatant in response to *M.leprae* were studied in treated smear negative lepromatous patients and active lepromatous patients undergoing treatment. All the patients were negative to lepromin skin reaction. No difference was seen in the antibody response to 35 kD antigen among treated and active patients. Treated patients showed significantly lower IgM response to PGL-I than active patients ( $p < 0.02$ ). No difference in the IgG1, IgG2 and IgG4 subclass response to *M.leprae* was seen however IgG3 was significantly lower in treated lepromatous group than active lepromatous group. 42% of treated patients produced IFN and 31% produced IL-2, whereas none of the active patients produced IFN and 11% of them produced IL-2. On the contrary less number of treated patients produced IL-10 than active patients however there was no significant difference ( $p > 0.01$ ). 42% of active and 50% of treated patients produced IL-12. 5% of treated patients produced IL-4 whereas 28.7% of active patients produced this cytokine. TGF production was seen in all the active patients and 77% of treated patients. This study shows that in some of the treated patients there is a tendency of upregulation of CMI.

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**Im 132****IMMUNOHISTOLOGY OF THE MACULAR LESIONS OF MONOLESIONAL LEPROSY**

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Patients presenting with flat, defined single lesions and, with no history of prior therapy were chosen for the study. Clinical details were recorded, skin smear for AFB done, and the lesions biopsied for routine histopathological analysis and immunostaining. Immunostaining to detect mycobacterial antigens was performed on sections wherein routine histopathology Hematoxylin and Eosin and Fite-Faraco staining of paraffin embedded sections was either non-confirmatory or equivocal.

Thirty eight subjects were chosen for the study. The cases were predominantly male adults and clustered into two main age groups of 20-28 years and 40-45 years. Fourteen (36.84%) had contiguous nerve thickening. Only half the patients took treatment for 6 months or more; amongst them, 3 subsided, 10 had regressive lesions, and 2 developed new lesions.

On routine histopathologic examination, leprosy could be diagnosed in 23 of the 38 cases (52.63%); AFB positivity contributed to the diagnosis in 4 cases. Two cases showed features of multibacillary leprosy. On immunostaining of sections where the histological diagnosis of leprosy could not be made, mycobacterial antigenic presence was observed in 6. The overall diagnosis of leprosy in this group of patients was 68.42%.

The implications of these findings vis-a-vis single dose and short course chemotherapeutic regimens will be presented.

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**Im 330****T CELL RECOGNITION OF PEPTIDES FROM M.LEPRAE 35 KDA PROTEIN IN THAI LEPROSY PATIENTS, HEALTHY CONTACTS AND NON-CONTACTS**

*Dr.B.Chua-Intra, Prof.J.Ivanyi, Ms.S.Wattanapokayakii, et al* Department Of Communicable Disease Control, Nonthaburi, Thailand

The objective of the study was to analyze human peripheral blood mononuclear cell (PBMC) responses to peptides from M.leprae 35 kDa protein in order to identify M.leprae-specific peptides for development of skin test reagents. The M.leprae 35 kDa protein was the antigen of interest since it has no homologue in the

M.tuberculosis complex. However, there are some homologues in M.avium. The subjects enrolled in this study were either new or treated paucibacillary (PB) and multibacillary (MB) leprosy patients, healthy contacts and non-contacts. Seventy three PB and one hundred and twenty four MB leprosy patients were recruited from four leprosy clinics in Thailand. Fifty seven healthy contacts were both household and medical personnel. Fourteen non-contacts had no family history or exposure of leprosy. The peripheral blood mononuclear cells from individual subjects were tested with 12 overlapping peptides from M.leprae 35 kDa protein by lymphocyte proliferation assays.

These peptides were focalized in four areas containing residues which are distinct between

M.leprae and M.avium. The result showed that response frequencies to each peptide did not differ obviously among PB, MB patients and contact groups. However, the most stimulatory peptides from each region, recognized by 30-40% of subjects from each group, were identified. Interestingly, 3 out of 4 peptides were not recognized by any of non-contacts. Thus from this preliminary result, these 3 peptides were likely to be M.leprae-specific. However, the authors need to prove their M.leprae-specificity by developing human T cell clones and testing with their M.avium homologues. Since the frequencies of recognition to individual peptides were not high, the combination of several peptides were suggested for skin test reagents in order to increase sensitivity.

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**Im 347****SEROLOGICAL DIAGNOSIS IN ACTIVE LEPROTIC AND TREATED PATIENTS**

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Antibodies against M.leprae antigens have been demonstrated in sera of leprosy patients. The general view is that they occur in large amounts in sera of lepromatous leprosy patients and their frequency and activity are lower towards the tuberculoid leprosy. Many serological tests were developed to evaluate the effect of antileprotic chemotherapy, and the antigen load in the patients proved that the level of phosphoglycolipids-I (PGL-I) in the serum might be the most reliable parameter to monitor early responses of leprosy patients to chemotherapy.

Assessment and evaluation of PGL-1 antibodies in the sera of leprosy patients were done by indirect ELISA using semi-synthetic PGL1 (ND-O-BSA) antigen.

Circulating antibodies appear to be directly dependent upon the clinical status of the patients. Circulating antibodies in LL, BL, BT, TL untreated and treated patients are estimated. The work and the results are in progress and will be statistically evaluated and presented.

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### Im 364

#### EXPRESSION OF CC AND CXC CHEMOKINES IN LEPROSY SKIN LESIONS

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We have investigated chemokine expression in leprosy skin lesions using immunohistochemistry to detect protein production and in-situ hybridisation to detect mRNA expression in skin. A panel comprising both CC chemokines (MCP-1, RANTES and MIP-1) and CXC chemokines (IP10, MIG and IL-8) were studied. Skin biopsies from 25 leprosy patients across the leprosy spectrum, 11 patients undergoing Type 1 reversal reactions and 4 normal donors were immunostained.

Each chemokine was expressed in the majority of reactional and non-reactional skin biopsies assayed. Levels of chemokine expression did not differ between tuberculoid and lepromatous leprosy lesions. The CXC chemokines interferon gamma inducible protein-10 (IP-10) and monokine induced by interferon gamma (MIG) were expressed strongly in all lesions. The CC chemokines monocyte chemoattractant protein 1 (MCP-1) and macrophage inflammatory protein-1 alpha (MIP-1) were expressed moderately. The CC chemokines regulated upon activation normal T cell expressed and secreted (RANTES) and macrophage inflammatory protein-1 beta (MIP-1) and the CXC chemokine interleukin 8 (IL-8) were expressed weakly in leprosy lesions. MIP-1 and IL-8 were expressed more strongly in reactional lesions than non-reactional lesions.

These results suggest that the chemokines investigated, which are known to chemoattract T lymphocytes and macrophages, are involved in assembling the cellular infiltrate found in lesions across the leprosy spectrum.

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### Im 379

#### THE PROTEOME OF M.LAPRAE IN CONTEXT OF NEW SKIN TEST ANTIGENS

**John S.Spencer, Angela M.Marques, Bruce C.Gregory & Patrick J.Brennan** Colorado State University, USA

Progress in the development of new skin test antigens is reported separately. We are also now applying dual proteomic-immunological approaches to developing reagents with greater specificity. One approach to the dissection of the cell-mediated immune response of a complex mixture of proteins is the electroelution of size fractionated proteins from preparative SDS-PAGE gels followed by protein characterization and immunological assessment. We have used this technology to produce size-fractionated cytosolic proteins from *M. leprae*. The individual fractions were probed with polyclonal and monoclonal antibody reagents by ELISA and 2D-PAGE Western blot to identify known proteins (or through elimination to identify novel proteins), reinforced by N-terminal sequencing and mass spectroscopic analysis. In addition, immunological responses (both antibody mediated and DTH responses) were assessed in *M.leprae*-, BCG-, and

*M.tuberculosis*- sensitized guinea pigs. Virtually all of the fractions gave sizable DTH responses in the *M.leprae*-sensitized guinea pigs, although the fractions containing proteins of molecular weight higher than 25 kDa produced higher responses. All fractions produced significant and lesser DTH responses in BCG-sensitized guinea pigs. To determine what specific proteins were dominant in each of the fractions, each was analyzed by ELISA and 2D isoelectric focusing gel electrophoresis. Immunogenic proteins recognized were: MMP-I; MMP-II; MCP-I/GroES; 65 kDa/GroEL-I and fragments; GroEL-2; DNAk/70 kDa; MtrA; Sod A; Ahp C; Hsp 18; L7/L12; EF-Tu; and 3 new proteins: electron transfer FixA flavoprotein subunit; RNA polymerase chain; and one with a novel protein sequence. The work to date indicates that the search for a single highly specific, highly immunogenic protein for leprosy diagnosis is probably futile; all proteins are highly immunogenic and cross-specific. Rather the current approach of using highly purified, highly immunogenic protein fractions with a differentially greater DTH response in sensitized guinea pigs, followed by testing in human populations, is the most promising approach.

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**Mi 16****PIGMENT PRODUCTION BY M.LEPRAE IN VIVO AND IN VITRO CULTURES**

**Dr.P.Banerjee, Dr.Sujata G Dastidar, R.Roy & Dr.A.N.Chakrabarty** Department of Helminthology, School of Tropical Medicine, Calcutta

Taxonomically, *Mycobacterium leprae* is a member of *Mycobacterium-Nocardia* group of the actinomycetes. Other related groups are *Aurantiaca*, *Gordona* and *Rhodococcus*. Almost all the members of these groups produce a variety of pigments : orange, pink, white, buff, lavender, salmon, red brown, brick-red, cream and other colours of pigments. These pigments, orange, yellow, buff-pink, tan, buff, chalky, malt, velvety, purple, grey, white, brown, pink, red can be found with or without O<sub>2</sub> on exposure to light. The pigment metabolism of these mycobacteria or nocardia could be best studied on solid media but also to a lesser extent in liquid media. On protein rich media, melanoid, a tyrosine-based pigment is known to form. There has been very little information on pigment production by *M.leprae*. Preliminary reports show that *M.leprae* harvested from lepromatous armadillo livers showed a deep brown pigment.

Vaccine preparation with such *M.leprae* harvest was considered unacceptable and unethical. However, it was later realised that the iron-protein produced by *M.leprae* was responsible for this chromogenic effect. Our studies on the in vitro cultures of *M.leprae* on gelatin minimal agar and silicon minimal agar media showed that in the former medium, pigmentation started with creamish colouration, changed to light brown on prolonged aging. On silicon minimal medium, which had a glossy background, the pigment finally turned to pink-brown. *M.lepraemurium* in Fe-supplemented media, developed pigments of light brown colour after 3 weeks which changed to deep brown within 6 weeks and by 3 months to blackish brown or snuff colour.

The pigment production seems to be both of diagnostic and toxicological importance.

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**Mi 27****ANTIBIOTIC-LIKE SUBSTANCES PRESENT IN THE SERA OF LEPROSY PATIENTS**

**Dr.A.N.Chakrabarty, Dr.Sujata G.Dastidar, K.Ganguly & Dr.P.Gupta** Calcutta University College of Medicine, Calcutta

Many actinomycetes, particularly those belonging to streptomycetes are versatile producers of different antibiotics and related class of molecules, the bacteriocins or nocardiocins (from nocardiae). However, there are hardly any report of antibiotic production by leprosy bacilli; this is possibly because of difficulties of growing the cultures in vitro and demonstrating its antibiotic activity by usual methods. This is, however, a widely but unexplained observation that cases of lepromatous leprosy with mutilation and open/exposed wounds, seldom get tetanus or other infections; this suggests that the patients lepra bacillary mass possibly offers a substantial protection due to antibiotic or such substances produced by it endogenously. Using a screening test based on dilutions of highly bacilliferous LL patients sera, it was found that only some sera but not all, caused inhibition of several members of a battery of sensitive test strains, e.g. *B.pumilus*, *B.sphaericus*, *B.megaterium*, *B.cereus*, *S.aureus*, *E.coli*, *Cl.tetani*, *Cl.perfringens* proteus and *Pseudomonas* spp. On investigation, it was found that LL cases which had already received some chemotherapy failed to show any inhibitory effects on these strains, while most of those LL sera of patients without any chemotherapy showed remarkable inhibitory effects.

We hypothesised that production of antibiotics by the LB in the LL cases stopped as a result of the bacteriostatic/bactericidal effects of these drugs on the leprosy bacilli circulating in the blood and tissues. We wanted to duplicate the inhibitory power of the serum of LL cases. For this purpose, several LL isolates available as CAN bacteria were cultivated in the GM medium fortified with guanine, hypoxanthene with optimum microaerophilic condition, incubating at 28 °C for various lengths of time and collecting the culture fluid at suitable intervals and looking for inhibitory effects by disc diffusion tests. The results showed a remarkable correspondence between the serum and culture fluid tests.

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**Mi 28****A PURE CULTURE LEPROSY VACCINE**

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The basic problems of leprosy immunity in lepromatous and non-tuberculoid cases are defects in cell mediated immunity, a progressive hyperbaccillimoea, a harmful persistent immune complex state, a macrophage granuloma reflecting a surrender of the host to the leprosy bacillus, and massive bacillary invasion of almost all tissue/organs. In theory and practice, experimental evi-

dences show that immunological unresponsiveness or anergy of LL cases to leprosy bacillary antigens can be partly/wholly changed to a positive response by exposure to various permutations and combinations with BCG, leprosy bacillus, other mycobacteria, and modulated by immunoboosters; some such responses may all-hhso be long lasting. As a result, the immunological failure reflected by lepromin anergy, immune complex formation, macrophage granuloma formation, may be corrected substantially; firstly, by reducing the bacterial load by appropriate chemotherapy(s); in the next stage, various combination immunotherapy will help achieving lepromin conversion of the cases by recruiting the appropriate subsets of the T-cells. An in vitro grown killed culture of the leprosy bacillus identified as CAN bacteria will be a most suitable ingredient of all combination vaccines. Our studies show that these in vitro cultures have same microbiological, molecular biological identity, and immunological specificity as that of the leprosy bacillus (Acta Lepr. 1999 (11) 105 - 112). Selective chemotherapy is a very suitable adjunct to vaccinotherapy based on in vitro sensitivity tests.

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### Mi 33

#### MYCOBACTERIA AND M.LEPRAE : SOME UNSOLVED CURIOUS PROBLEMS

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Two curious unexplained characteristics of growth of mycobacteria, including that of *M.leprae* are (i) Unusually varied growth rates : rapid, slow, very slow, non - growers. This is not known for any other group of bacteria. (ii) The traditional anti-biotics, streptomycin, kanamycin, chloramphenicol, tetracyclines, penicillins, etc. are ineffective compared with SuDDS, EMB, PZA, PAS, INH, ETH, CFZ, THA, MINOCYCLINE, QUINOLONES, RIFAMPICIN, etc. which are now known as non-antibiotics .

This preferential drug-susceptibility appears to be the result of this group belonging to the actinomycetes and serving as biochemical factories of numerous antibiotics having natural immunity against these antibiotics. It follows, therefore, that searches for antimycobacterials among non-antibiotics may be rewarding. This part we have described in a companion paper.

As regards finding an answer to the problem of highly variable growth rate and speed of growth, we have found that the mycobacteria, including *M.leprae* be-

long to two nutritional poles, i.e., either these are chemoautotrophs (requiring simple C and N sources) or heterotrophs (requiring complex C and N sources), or admixtures of these 2 characteristics in different proportion, giving rise in effect rapid growth (heterotrophic), and non-growers (chemoautotrophic); slow and very slow growers mix these characteristics in varied proportions.

Our hypothesis, if true, could be proved in practice by devising a biphasic medium : comprising a heterotrophic bottom layer (LJM, without malachite green, the toxic dye) overlaid with a 2-mi layer of 7H10 medium (basically a hemoautotrophic medium) with the tetrazolium dye at a final concentration of 200 mg/ml. If clinical materials were used for cultivation, a combination of chloramphenicol (50 mg/l, polymyxin 25 mg/ l and carbenicillin 15 mg/l eliminated all contaminants. Fungi were avoided by using actidione @ 2 mg/l l. We had a large miscellaneous bag of mycobacteria including M.TB and

*M.leprae*. Growth evident from appearance of colonies and tetrazolium reduction within 48 hours gave clear cut results on the merits of the biphasic medium which has a sound theoretical basis. We had presented preliminary results at Antwerp and Madrid recently. We present details in this Congress, on the usefulness and possibilities of this medium as a rapid cultivation and susceptibility testing tool.

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### Mi 37

#### EVALUATION OF LEPROSY LESIONS BY SKIN SMEAR CYTOLOGY IN COMPARISON TO HISTOPATHOLOGY

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Skin smears of 25 clinically suspected cases of leprosy were evaluated cytologically - fine needle aspiration cytology done in 13 patients with raised or nodular lesions and slit skin smear done in 12 patients with flat lesions. Cytological subclassification was done across Ridley-Jopling spectrum by reading May-Grunwald-Giemsa stained smears in conjunction with Ziehl-Neelsen stained smears. The results were later compared with histopathological interpretation of skin biopsy taken from same site.

Skin smear interpretation was conclusive in 18 (72%) patients and these were placed in Ridley-Jopling classification. On comparison with skin biopsy results;



complete cytohistological correlation was seen in 16(64%) and this comprised of 7 cases of Tuberculoid group (2 TT, 5 BT), one of BL and 8 of LL group. Cytohistological concordance was 100% in Polar leprosy.

Skin smear cytology, being a simple, relatively non traumatic, cost and labour effective technique with a high degree of histopathological correlation is recommended for routine use in diagnosis and follow-up of leprosy cases.

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### Mi 39

#### NERVE TRUNK DESTRUCTION IN LEPROSY - A MORPHOLOGICAL STUDY

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The impact of leprosy is on nerves. The peripheral nerve trunks are the ones that generally get affected and damaged. While their involvement is detected clinically by thickening and tenderness with resultant loss of function, it is difficult to assess the histo-pathological changes in them. This is because these nerve trunks cannot be subjected to biopsy. However, it was possible to get 25 biopsy specimens from specially selected cases in a study of nerve grafting. The histological findings in these specimens are reported.

The proximal and distal ends of the specimen were marked while taking out the specimens at biopsy. A comparative assessment of qualitative and quantitative changes of the two ends was thus possible.

With the exception of 3 specimens, all the rest shared an epithelioid cell granuloma indicating the cases to be TT or BT types of leprosy. As characteristic of these types, many of the funicles were totally or partially destroyed, while a few remained intact. In 8 specimens, there was almost total destruction of the nerve with hyalinization or fibrosis. The destruction was more marked at the distal end than at the proximal end.

Cellular infiltration varied considerably. In some there was total fibrosis with minimal cellular infiltration, while in others there was varying degree of inflammatory exudate. The presentation is purely on morphological findings.

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### Mi 61

#### STUDIES ON QUANTITATIVE RELATIONSHIP AMONG NORMAL MOUSE PAD, PCR AND ATP BIOLUMINESCENCE METHODS

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Various techniques have been used for monitoring of treatment in leprosy. These include commonly used method mouse foot pad (MFP) as well as other techniques like PCR and ATP bioluminescence. In our earlier study we reported on the overall qualitative relationship between these methods. While there was general correlation in the trends, there were differences in the actual positives reported by these methods. It would be thus important to understand quantitative relationship among these methods. In the analysis being reported in the present study, an effort has been made to understand quantitative relationship among these methods in BL/LL cases being treated with different therapeutic regimens. Biopsies were collected at various intervals of treatment and were processed for viability assessment by MFP (Shepard et al), PCR (Williams et al and Hartskeerl et al) and ATP by (Katoch et al) by techniques already established at this institute. Biopsies were initially divided into two parts-one part was processed for mouse foot pad whereas the other part was processed for assessment of ATP levels as well as PCR positivity by either of two methods. ATP levels were measured as pg/ million acid-fast bacilli. Comparison of the results of these three techniques suggest that there is overall relationship between these methods when the ATP levels are in higher range. However, the relationship between the ATP vs PCR or ATP vs MFP is not straight in the lower ranges. The clinical significance of these findings needs to be debated.

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### Mi 103

#### FALL IN THE BACTERIOLOGICAL INDEX IN LEPROSY SKIN SMEAR

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Objectives : To observe trend in fall of B.I. in bacteriological positive cases, registered in the Leprosy Mission Hospital, Naini.

Design : Retrospective study, reference from individual case charts, 100 cases of the year 1997 were followed up till the date released from treatment.

Setting : The Leprosy Mission Hospital, Naini, Allahabad

Participants : M.B. cases registered in 1997 and were released from treatment before March 2000

Main Outcome Measures : Percentage of cases, which will show a standardised fall of Bacteriological Index

Results : 15% had a B. I. fall of 0.31. 20% had a B. I. fall of 0.61, 42% had a B. I. fall of 1.01, 12% had a B. I. fall of 2.3 1, and 3% had a B. I. fall of 1.64, at the time of release from treatment.

Conclusion : 42% cases which had a B. I. fall of 1.01 per year, proves by this study that the average fall in B. I. is 1.01 per year.

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for BIG in skin biopsies with value ranging from 1+ to 4+. In comparison, in 12 patients of LL group, 11 were positive for both skin smears and for BIG.

The difference between BI of skin smear and BIG in the present study was observed to be 1+ in 18 patients, 2+ to 3+ difference in 8 each, 4+ difference in 6 and 5+ difference in 1 patient.

This study identified 8 patients with less than 5 lesions, who revealed AFB with BIG ranging from 1+ to 4+ on skin histology. 4 of them revealed BL on histology with a BI ranging from 3+ to 4+. This study raises the issue whether BI of granuloma is a better indicator of the bacterial load and a true indicator of multibacillary or paucibacillary status.

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## Mi 172

### COMPARATIVE STUDY OF BI OF SKIN SMEARS AND BACTERIAL INDEX OF GRANULOMA (BIG) IN LEPROSY

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For the purposes of therapy, leprosy patients are grouped into Paucibacillary & Multibacillary leprosy based on clinical & bacteriological criteria. As all skin smear positive patients irrespective of their classification are grouped as MB leprosy, skin smears were considered as the final arbiter. More recently, in view of the general poor quality of skin smears there has been a de-emphasis on skin smears. Although histopathology remains as a standard diagnostic tool in the diagnosis of leprosy, it has no assigned role in treatment of leprosy.

The aim of the present study was to compare the bacterial load in the skin biopsy (expressed as BI of granuloma - BIG) to the BI of slit skin smears and to look for any predictable patterns and their probable value as a parameter in therapy of leprosy. This study was conducted in the Department of Dermatology of Osmania Medical College, Hyderabad, India between January & December, 1998.

108 patients (males 80; females 28) were included in the study. The clinical classes were TT-1; BT-61; BL-24; LL-12 and Ind. Leprosy-4. Skin smears were positive in 23 out of 108 patients (21.3%), whereas 42 biopsies were positive for bacilli (38.8%). Out of the 61 patients clinically classified as BT, only one patient was positive in skin smear, whereas 10 were positive

## Mi 296

### EXPERIENCES WITH QUALITY CONTROL OF SLIT SKIN SMEARS IN WEST NEPAL

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Green Pastures Hospital in Pokhara, Nepal has been functioning as a tertiary leprosy referral centre for over 20 years. After the integration of leprosy control programmes into the general health system of Nepal in 1987, the laboratory of Green Pastures Hospital was appointed with the task to set up a quality control network for slit skin smears within the Western region of Nepal for basic health service laboratories.

A survey was done by sending out all required materials such as slides and reagents to the peripheral laboratories through the quality control network in the Western region of Nepal. The basic health service laboratories were requested to send back 10% of their positive and negative slides for quality control. However, 52 slides were received during this survey. All slides were rechecked, comments on the quality were made and sent back to the peripheral laboratories. Practical training and quality checkups were organized accordingly.

The following results were seen during the first survey. Regarding the quality of smearing,

30.7% of the slit skin smear slides were found to be spoiled with blood and did not have sufficient tissue material. Staining was not done adequately in 26.9% of the slides showing no sufficient decolourization and also precipitation of carbol fuchsin. The bacteriological index (BI) of the positive slides correlated with the grading of the surveyors in only 22% cases. Positive slides reported as negative were found in 15.4%. After



follow up activities, insufficient smearing and staining was seen in only 8% respectively 2% of the slides and correlation of BI values occurred in 93%.

We conclude that the experience in the Western region of Nepal demonstrates the importance of tracing problems and providing practical training in the area of slit skin smears in order to improve the performance in the peripheral laboratories.

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### Mi 381

#### ENDOTHELIAL CELL INFECTION IN THE PATHOGENESIS OF LEPROMATOUS NEURITIS

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*M. leprae* is the only bacterial pathogen that infects peripheral nerves, often leading to deformity and thus to the stigma associated with leprosy. The mechanisms responsible for localization of *M. leprae* to peripheral nerves and therefore responsible for initiating specific nerve injury, have eluded detailed investigation due to the serious limitations in the biopsy of human peripheral nerves and the lack of good animal models.

Recent studies have revealed that experimentally infected armadillos develop a neuropathy which closely resembles human lepromatous neuritis. Evidence from this model suggests that an early event in the infection of peripheral nerves by *M. leprae* is the infection of endothelial cells of the epineurial blood vessels and lymphatics.

In order to study the mechanisms of infection of endothelial cells, we have examined the interaction between human umbilical vein endothelial cells (HUVEC) and *M. leprae* in vitro. HUVEC bound and ingested freshly obtained *M. leprae* and control BCG in a time and concentration-dependant manner. Uptake increased slowly, peaking at 18-24 hr. for *M. leprae*, and at 12-18 hr for BCG. Optimal uptake of *M. leprae* requires a ratio of bacilli: HUVEC of approximately 100:1. Assays using radiolabelled bacilli have revealed that uptake is slightly accelerated with heat killed or aldehyde fixed

*M. leprae*. Ultrastructural and confocal microscopic studies have indicated that some bacilli are internalized soon after binding to HUVEC. This suggests that the delay in uptake is probably due to low levels of binding initially by mechanisms which may be upregulated after prolonged exposure to mycobacteria.

We propose that *M. leprae* first colonize the surface of nerves, infecting lymphatic and vascular endothelium, then extend inward along blood vessels into the en-

doneurium. This is consistent with many previous reports of endothelial cell infection in leprosy, but contrasts sharply with the classical view that the bacilli initially bind and enter Schwann cells, ascend within the nerve, and explode outward. The possibility that nerve involvement by *M. leprae* begins with endothelial cells offers new approaches to understanding the pathogenesis of nerve injury in leprosy, viewing this as a dynamic sequence of adhesion, immunologic and inflammatory processes involving endothelium. The identification of specific mechanisms in this pathway of infection may offer new opportunities for intervention to treat or prevent nerve injury in this disease, and thus to prevent permanent nerve loss and subsequent deformity.

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### Mo 26

#### CAN DNA HOMOLOGY BE THE ABSOLUTE YARDSTICK TO IDENTIFY M.LEPRAE?

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Before the nucleic acid characteristics of the leprosy bacilli (LB) could be adequately understood, there was a general belief that all LB possibly belong to a single genetic type, and identification of isolates of LB would depend on their conforming to this type. Studies on DNA relatedness of LB strains, however, revealed a wide diversity among different isolates. These genetic diversities could be due to the leprosy bacillus being prevalent for thousands of years over widely separated geographical regions like India, China, Egypt, Africa, Europe, as well as, the New World with chances of segregation and multi-centric evolution. These genotype differences are similar to those existing among the salmonellae, the plague bacilli, cholera vibrios and the tubercle bacilli; these differences in leprosy bacilli correlate well with distinct clinical diseases these types or subtypes produce. These often have a geographical segregation. In recent times, application of numerous taxonomic parameters showed that the so called *M. leprae* forms a dense cluster of human pathogenic strains, yet are divisible into numerous genetic subtypes, as evident from the work of different workers. These had thrown new light on several distinctly different biological types, e.g. those with long/short generation time (slow/fast growers) those with low or high yields in vitro; slow or fast growers in the mouse footpads; multibacillary, clinical LL or TT types; lucio type, histoid type, alopecia type, hyperbacillary single nodule type, pure neuritic

type, ulcerating type and skin pustule type; xanthene/hypoxanthene utilising type. These distinct but stable biotypes confirm the wide genetic variability within the cluster called leprosy bacillus which actually comprises many heterogeneous subtypes.

The clinical diversities observed seem very distinct, stable and well demarcated geographically. Such distinct clinical diversities should be determined by and reflected in genetic diversities of the leprosy bacilli. Predictably, when LB isolates from diverse sources were compared to the Reference strains, marked differences were found among different strains; moreover, the different reference strains used by different workers, varied widely among themselves, disproving the earlier dogma that all LB basically belong to a single genetic type. The reference strain(s), thus lost their value and purpose as single yardstick(s) for identifying LB of different origin. Another complicating problem was that the DNA hybridisation intensities of LB strains varied according to the DNA region tested, and had therefore caused much confusion, which seemed

Continued on next page natural as thus far only 50% of the DNA domains of the LB had been explored, leaving remainder as blind areas.. Specific probes of adequate number are lacking, which prove their point of diversity further. Thus, the lack of sufficient homology among different LB is not surprising, as DNA-wise the LB isolated from different human/animal/or geographical sources may be greatly heterogeneous, but sub-divisible into different types. Other basic tests will serve as gold standard to identify LB.

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## Mo 27

### USE OF REVERSE TRANSCRIPTION POLYMERASE CHAIN REACTION (RT-PCR) FOR THE DETECTION OF MYCOBACTERIUM LEPRAE IN THE SLIT SKIN SMEARS OF LEPROSY PATIENTS

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Bacterial Index from the slit skin smears is a commonly used parameter for the clinical evaluation and management of leprosy. Its relevance for understanding prognosis of patients on treatment has been extensively debated, as it does not give a very clear idea of the viability of the bacteria in patients under treatment. As the treatment duration in multibacillary (MB) cases is reduced, it is important to know the bacteriological status of the patient at the end of the treatment.

Reverse transcription polymerase chain reaction (RT-PCR) was used to detect *M.leprae* in slit skin smear samples of leprosy patients. For this we extracted RNA using Trizol reagent (Life Technologies, UK) from the slit skin smear samples from 13 leprosy patients. The RNA preparation was used for the RT-PCR. *Mycobacterium leprae* specific primers for the fragment of 16S ribosomal RNA gene were used in the amplification (Ryon et al. J.Clin.Microbio. 1998,36(5), 1352-56). Samples from seven patients showed amplification by RT-PCR. Of these, two were new cases, four were suspected relapse cases and one was under treatment. Other six patients whose smear samples did not show any amplification by RT-PCR were on MB-multi drug therapy. The usefulness of the technique needs to be more extensively explored for studying viability of *M.leprae*, efficacy of treatment and presence of other mycobacteria in the slit skin smear samples.

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## Mo 68

### SIMPLIFIED PCR DETECTION METHOD FOR NASAL MYCOBACTERIUM LEPRAE

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**Aim :** The purpose of this study was to determine the accuracy and specificity of the simplified PCR method for the detection of nasal *Mycobacterium leprae* and its suitability for application to a larger epidemiological study of *M.leprae* transmission in rural India. We also wished to confirm that the nasal *M.leprae* was not present in nasal swabs from a non-endemic population.

**Methods :** DNA was extracted from nasal swabs and analysed by PCR, and *M.leprae* specific amplicons detected by means of a novel peptide nucleic acid (PNA)-ELISA method. The supply of laboratory consumables and overall detection procedure were simplified and standardized by the use of PCR Ready to Go beads.

**Results :** Of the total 219 nasal swabs tested, 213 swabs were collected from different individuals and six swabs were spiked with *M.leprae* DNA. The swabs were coded and analysed blindly by PCR using two different sets of primers (for pra and rlep) separately and subsequent PNA ELISA and blot. After decoding it was found that all the positive swabs had been spiked with *M.leprae* DNA whereas all other swabs were negative. No false positive results were obtained. These results confirm the negativity of swabs from a non-endemic country.

**Conclusion :** The PNA ELISA and use of manufactured PCR beads simplifies the PCR detection of



M.leprae to a point suitable for application in large scale epidemiological studies.

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## Mo 91

### CONFIRMATION OF DIAGNOSIS IN DIFFERENT FORMS OF LEPROSY BY PCR AND GENE PROBES

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The development of PCR assays for detection of M.leprae directly from clinical specimens was expected to provide a major help to improve the diagnostic capabilities. Over the last 5-7 years our laboratory has used various DNA as well as in-house standardized rRNA targeting PCR methods as well as rRNA targeting probes for the detection of M.leprae in the clinical specimens (mainly biopsies). Various clinical groups included in these studies are well established clinical forms, indeterminate as well as suspicious cases. DNA as well as rRNA from the biopsy specimens were extracted by a physiochemical procedure adapted at the laboratory. Besides assessing the hybridization with rRNA targeting probes, PCR assays using different gene targets were performed by established systems. Analysis shows that RNA probes are mainly relevant in MB cases (including low bacillated specimens) as well as a section of PB specimens for monitoring of treatment. On the other hand, different PCR assays were constantly found to be useful in early atypical forms with positivity ranging from 50-70% in these specimens in different series of patients investigated in the laboratory. The need to have PCR laboratories (may be at least in referral centres/institutes) needs to be seriously considered for improving the diagnostic capabilities in the new millennium.

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## Mo 210

### APPLICATION FOR PCR ASSAYS TO RELAPSED LEPROSY CASES

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PCR techniques have been earlier reported to be correlated with viability in leprosy and other diseases. We had observed similar trends earlier. From our earlier studies as well as some published reports it has been inferred that PCR assays can be used to monitor the progress of leprosy cases under treatment and also relapsed cases. However, as the disease profile is constantly changing, there is need to continue these studies using different PCR methods. In this extended study, the biopsies from clinically relapsed leprosy cases have been processed for extraction of nucleic acids. A DNA targeting PCR assays described by Hartskeerl et al (36 kDa) and Pattyn/ Cox et al (rDNA) have been used to investigate these specimens. PCR product was analysed on the agarose gels as well as by southern blot hybridization. Positive amplification was observed in majority of the specimens which belonged to paucibacillary spectrum. All the multibacillary specimens were PCR positive by both the methods. Better sensitivity with probe hybridization was observed. PCR method targeting 36 kDa was found to be more sensitive than the rDNA targeting method of Cox/ Pattyn et al. Overall, both the PCR techniques appear to be useful for investigating the relapsed leprosy cases currently coming to clinics.

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## Di 19

### DELAYS IN PRESENTATION FOR TREATMENT IN LEPROSY

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**Objectives :** To prevent disability amongst those affected by Leprosy and encouraging them for early presentation and treatment.

**Design :** Prospective Observational study. 30 new cases were interviewed, assessment done clinically and bacteriological. The data included demographics, first symptom and individual patients first action behavior, etc.

**Setting :** Out patients Department, The Leprosy Mission Hospital, Naini, Allahabad

**Participants :** Out patients visited to Hospital first time.

Results : Looking at delays and now presenting for treatment at hospital was resulted that deformity was more. 11 cases (36.66%) Grade II, 8 cases (26.66%) Grade I, 11 cases (36.66%) no deformity.

Conclusion : Since delay is associated with increased disability, we need to bring significant changes in attitude of people living in rural areas and far from Leprosy Hospital, should go and contact nearby hospital. Our study identified the major causes of delay and allow us to plan an appropriate multi media campaign for the awareness of Leprosy. This will help in early diagnosis and treatment to prevent any disability.

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## Di 21

### EXPERIENCES OF USE OF PREDNISOLONE IN PREVENTION OF NEURITIS AND DEFORMITY IN LEPROSY CASES

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The advantage of Prednisolone has been well documented in previous literature. However, the use of drug, for want of proper monitoring and follow-up, has not come up with expected results.

The present study describes about the 100 cases selected for study, who were put on Prednisolone in field situations with MDT or after MDT was over.

As was expected, the results will be uniform in nature but it was observed that out of the 100 cases, only 15% of the cases were benefitted, 20% partially benefitted but the rest were not benefitted at all.

The objective of the study was to know the gravity of the problem in cases under study and also to know factors responsible for the unsatisfactory results. Whether those were either due to improper selection of cases or lack of proper training on the part of programme managers or either due to improper dose or due to improper follow-up activities.

The study was definitely given an insight to look into the problem and also has initiated the programme manager to give sufficient attention to this component also.

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## Di 42

### DEFORMITY AND GENDER

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In order to know the influence of gender on incidence and profile of deformities, a retrospective analysis of all the 4047 cases registered in GMLF Leprosy control unit at T Narsipur since its inception was carried out. The patients were categorised into G0, G1, G2 as per WHO classification.

The results show that, 9% of the total cases developed G1 deformities and 6.2% developed G2 deformities. Among males, 7.8% and 3.7% among females developed G2 deformities. While flexion of both the hands is the most common among the males (5.5% of those deformed), clawing of right finger is the most common among females to the extent of 5.8% of G1 + G2. Flexion of both the hands and absorption of all the fingers take 2nd position to the extent of 5.1% among females, whereas absorption takes second position among males to the extent of 4%. Comparatively lesser percentage of females with multiple cases (16.1%) developed deformities, whereas the same is 22.6% among males. Maximum of those developed deformities among males are of LL type cases (36.4%) while the same are of BL type (66.7%) among females.

The paper also presents detailed analysis of various factors that are associated with deformity, and this variation in both the genders, which are presented in the full length paper.

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## Di 94

### INVOLVEMENT OF COMMUNITY VOLUNTEERS FOR AUGMENTING 'POD' SERVICES IN RURAL AREAS - PRELIMINARY OBSERVATIONS

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Prevention of Disabilities (POD) in leprosy is a very continuous process that requires special technical skills to be meticulously applied using appropriate materials to achieve the goal. However this has not been widely practised along with routine MDT programmes, particularly in rural areas mainly due to operational reasons and limitations in transfer of technology to the grass root level leprosy workers. There is a need to overcome these difficulties by involving the volunteers derived from the community and to inte-



grate the POD services along with the routine leprosy programme. Bombay Leprosy Project (BLP) has implemented a POD programme using the simple techniques developed by the project through the community volunteers (CVs) who delivered POD services at the doorstep of leprosy patients in urban slums. This urban POD programme proved to be highly feasible and cost-effective. Based on this experience, we attempted to extend similar programme in rural areas adjoining Bombay to practise POD using community volunteers.

For logistic reasons, we have chosen two rural districts namely Thane & Raigad in Maharashtra, which are easily accessible from Bombay to implement this programme. The coverage of population was defined with the object of epidemiological analysis after the follow-up. The local leprosy workers were given task-oriented training on simple techniques of POD services. CVs from the same locality were identified and given simple task specific training. All risk group cases were assessed periodically for POD services initiated by the leprosy workers. CVs offered services at the doorstep of patients and ensured treatment compliance. Material supplies for providing POD services were made available on regular basis. Service delivery was planned and implemented through the community volunteers. Monitoring the progress of disability status using simple grading system was done at regular intervals.

Continued on next page District Location No. of leprosy Population No. of disabled patients workers & CVs adopted identified and served

Bombay R-Ward (semi-urban) 12 300,000 159

Thane Ulhasnagar 3 200,000 29

Dombivili 3 200,000 45

Raigad Panvel Taluka 11 100,000 71

Uran Taluka 10 100,000 148

It is observed that the transfer of technology would be possible if the techniques and the components of POD services are simple. The involvement of CVs who can act as a catalyst between the leprosy worker and the leprosy patients will ease the logistic problems prevailing in the rural areas.

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## Di 112

### HELPING DISABLED LEPROSY PATIENTS WITH ADL - ASSESSMENT

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Leprosy cured persons with deformity or disabilities due to leprosy look forward to a normal day-to-day living. It is a known fact that misuse and disuse of insensitive and paralytic limbs are the main cause for deterioration of deformities and disabilities. The activities of daily life and the occupation of the patient are greatly altered by the type and gravity of their deformity and disability. The study examines the relationship between the ADL and the type and severity of deformity.

Specifically the study examines 209 leprosy patients with Grade-II deformities on the basis of International Classification of Impairments, Activities and Participation (ICIDH - 2 - WHO 1997). It outlines the ADL (Activities of Daily Life) of the patients in terms of self care, work and leisure activities and relative impact on the deformities and disabilities. Further, the study analyses the role and the impact of the socio-economic factors on their daily life. It suggests deformity related remedial steps for their ADL - to prevent further deterioration of their condition.

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### IMPACT OF STEROID THERAPY IN PREVENTING DISABILITIES IN LEPROSY - A FIELD EXPERIENCE

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The advantage of using corticosteroids (prednisolone) in leprosy for preventing the disabilities outweighs the risk of being used by the para-medical staff under medical supervision following task-oriented training. The consequences of reaction commonly result in irreversible nerve function impairment, if not identified and treated adequately with steroids. Several researchers have recommended the use of standard regimen for steroid therapy for field use by the para-medical workers. We initiated a study as a part of our POD programme being implemented along with the routine MDT programme giving more emphasis to identify and treat reactions with neuritis at the field level.

A field based POD programme was implemented in Raigad District, where the Government of Maharashtra is doing the basic leprosy control work. All field level staff were given orientation in identifying and treating reactions / neuritis with steroids. 48 leprosy patients with signs of reaction (acute neuritis) were included in the study of which 31 patients also had early or partial nerve function impairment. While 77% of the patients were male, 25% of them were children. All

patients were treated with standard course of steroid therapy recommended by WHO (1998). Initial clinical and neurological findings were recorded and the patients were subjected to reassessment at monthly intervals.

52% of the patients with early nerve function impairment showed complete sensory recovery, while 35% had shown partial improvement. The motor recovery was significantly greater among patients with lagophthalmos and foot drop (69%) compared to those who had claw hand and thumb deformity (33%). 62% of patients with early claw hands improved partially. In none of the patients nerve function deteriorated.. Nerve pain completely diminished within two weeks of treatment. No serious or permanent side-effects were noticed.

We will present the limitations of standard steroid therapy and its operational shortcomings. The increase in compliance of treatment by the leprosy patients and its acceptance by the field staff will be discussed. The factors such as training of para-medical workers, their motivation and the feasibility of monitoring the effectiveness of steroid therapy will be presented in detail. We conclude that the standard steroid treatment can be effectively practised at the field along with the routine MDT programme, which will immensely help to eliminate the social stigma about leprosy.

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### Di 163

#### RELATIONSHIP BETWEEN GRIP STRENGTH, PINCH STRENGTH AND BASIC ACTIVITIES OF DAILY LIVING IN LEPROSY PATIENTS

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The objective of this paper is to determine the relationship between grip strength, pinch strength and basic activities of daily living ( BADL ) rating in leprosy patients.

It is a retrospective and cross-sectional study of the hand function and BADL respectively, done in the occupational therapy department of the Schieffelin Leprosy Research and Training centre, Karigiri.

The subjects are the in and out-patients with normal vision but having motor nerve function impairment and not having any absorption of digits or ulcers in one or both the hands, who were either under drug therapy and / or relieved from medical rehabilitation.

The main outcome measures were grip strength which was measured using the baseline hydraulic hand dynamometer (equivalent to Jamar dynamometer, USA), pinch strength was measured using Jamar pinch gauge (USA) and BADL assessment was done using Karigiri's Activities of daily living rating system

The percentage of patients who scored less in BADL and whether or not the grip strength and pinch strength are considered as the key factors contributing to the problems in BADL and the relationship between grip strength, pinch strength and BADL rating will be presented and discussed.

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### Di 216

#### FORM AND FUNCTIONAL RECOVERY AMONG LEPROSY PATIENTS WITH PARALYTIC DEFORMITY AND DYSFUNCTION - THE ROLE OF CORTICOSTEROIDS?

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Form and function appear to be mutually complementary for many organs. This phenomenon especially appears to be relevant to leprosy related nerve damage which causes paralysis of certain groups of muscle resulting in muscle imbalance leading to deviation from the normal form - a deformity. These deformities are not only cosmetically abnormal but also lead to dysfunction or a disability. Timely intervention with corticosteroids in the proper dosage and duration helps to restore normal form and function. We inducted for our study 108 leprosy patients with 194 visible paralytic deformities of less than one year- duration (ULNAR- 101, MEDIAN-41, LATERAL POPLITEAL- 36, FACIAL- 15, RADIAL- 1). The duration of steroid was individualized according to response. The starting dose of the steroid (Tab.Prednisolone) was 60 mg per day and duration varied from 5 months to 24 months. We present our results which were very gratifying since benefit accrued to the majority of the patients. Improvement of ulnar nerve was 52%, median 68%, lateral popliteal 61% and facial 80%. Females showed better recovery of nerve function than males (Female 71%, Males 56%). Contrary to previous observations, older age group showed better recovery than the younger ones (11-40 years of age = 52%, 41-70 years of age = 79%). Our findings will be presented with tables and figures.

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**Di 227****THE EPIDEMIOLOGY OF NERVE FUNCTION IMPAIRMENT IN LEPROSY -AN UPDATE****Dr. Wim H. van Brakel** New Delhi

**Purpose :** To give an update on the epidemiology of nerve function impairment (NFI) in leprosy.

**Methods :** A review of current and recent literature reporting on studies with 100 or more subjects from MDT programmes. Some previously unpublished data from a leprosy control programme in western Nepal are also included. Prevalence data and data on the results of steroid treatment are presented as percentages; incidence as rates per 100 person-years at risk (PYAR).

**Results :** Depending on the country and the programme, 16-56% of newly registered patients already have clinically detectable impairments (WHO grade 1+2), often no longer amenable to drug treatment. Among new patients, 6-27% present with secondary impairments (WHO grade 2), such as wounds, contractures and shortening of digits, usually preventable consequences of the autonomic, sensory and/or motor neuropathy. Among MB patients, who form the majority of new cases in some countries, the percentage is even higher: 33-56%. Incidence rates for nerve function impairment (NFI) per 100 PYAR have been reported as 1.3-3.5 for PB and 7.5-24 for MB during and after MDT. Sensory impairment with rates ranging from 0.9-2.7/100 PYAR in PB and 13-18.5/100 PYAR in MB, is more common than motor impairment, which has been reported ranging from 0.4-1.3/100 PYAR and 7.5-9.4/100 PYAR in PB and MB, respectively. When detected and treated in time with corticosteroids, the primary impairments may be reversible. However, a substantial proportion of patients (11-51%) does not recover or gets worse. In recent studies only 29-42% recovered fully. There are some data showing that around 10% of PB patients and one third or more of MB patients have impairments resulting from neuropathy at release from treatment.

**Conclusions :** Neuropathy (NFI) is still a very common complication of leprosy, occurring both before treatment, during MDT and after release from treatment. Even after successful treatment a very substantial proportion of people will continue to suffer from neuropathy and its consequences. Efforts at prevention of neuropathy and the secondary impairments resulting from it should be continued and strengthened.

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**Di 417****MULTIDISCIPLINARY MANAGEMENT FOR PREVENTION OF DISABILITY IN THE PATIENT WITH INSENSITIVITY****Stephen A.Ashford** Premananda Memorial Hospital, Calcutta

In the field of leprosy rehabilitation, a number of common impairments are seen, one of these is the insensitive or anaesthetic foot. Insensitivity in the foot is caused by damage to the posterior tibial, nerve. This lack of feeling can lead to risks of injury when an individual is engaged in every day activities, e.g. walking (Watson, 1886). Associated with insensitivity of the foot is the autonomic function, which is also lost when the nerve is damaged. This leads to the skin being dry and liable to crack. In leprosy, it is also common to get motor impairment due to nerve damage, which causes paralysis and weakness of muscles. Associated with the insensitive foot, it is also common to get foot drop, of inability to dorsiflex the foot, which thus produces alterations in biomechanics (Wanen 1999).

Two cases of patients with insensitive feet are presented. The first case is that of Ravi, a 32 year old man, who is unemployed and lives in a leprosy colony. He has been successfully treated for his leprosy with multi-drug therapy (MDT) and is now cured. However, during the course of his disease, he has lost sensation and autonomic function in both his feet. The muscles which work to dorsiflex his foot have also been affected so that he now has foot drop. These, along with many other factors caused him to develop a neuropathic right foot. This proved very difficult to manage even though different members of the hospital team worked with him.

The second case is that of Sai, a 28 year old man, who is the owner of a small retail business. He has also been treated successfully for leprosy with MDT and is also now cured. Unfortunately, he had sensory and motor damage to his right foot during the course of the leprosy. He is now unable to feel his right foot or dorsiflex it. As a result of this and other factors, he now has a neuropathic foot. The foot problem is also responsible for causing social problems and other functional disability for Sai.

Prevention of disability education in leprosy patients is a key responsibility of all members of the team. Those providing education should involve the patient and indeed make him or her the central member of the team. The concept of team or multidisciplinary working is key when treating and rehabilitating leprosy. Neuropathic disintegration of the foot is a multi-factorial condition, and should be approached as such (Warren, 1999). Management of insensitive feet should begin early with full assessment of all issues related to preventing injury to the foot (Watson, 1986, Brand, 1966).

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### Di 179

#### USE OF THE EYES, HANDS, FEET (EHF) SCORE AS AN IMPAIRMENT SEVERITY SCORE

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**Objectives :** To discuss the concepts of classification and severity grading in relation to impairment in leprosy, and to describe the use of an impairment sum score, the Eyes, Hands, Feet (EHF) score, as an indicator of the severity and the evolution of impairment over time.

**Design :** Retrospective cohort study. The use of an impairment sum score, the EHF score, is illustrated using data on impairment at diagnosis and after a two-year interval obtained in a cohort of 706 leprosy patients. The 1988 WHO disability grading scale (0-2, for both eyes, hands and feet - six sites) was used as a measure of impairment. For the analysis, the WHO grades for the six sites were summed to form an Eyes, Hands, Feet (EHF) score (minimum 0, maximum 12). The sensitivity to change over time of the EHF score was compared with that of the method of maximum grades.

**Setting :** Field MDT clinics in the Western Region of Nepal.

**Participants :** MB patients released from MDT.

**Main outcome measures :** Severity of impairment according to the WHO maximum grade and the EHF score; percentage of patients with a given impairment status; percentage of patients showing improvement, no change or deterioration according to the WHO maximum grade and the EHF score.

**Results :** Using the method of maximum grades, 509/706 patients (72%) appeared not to have changed in impairment status versus only 399 (57%) with the EHF score. Improvement or deterioration of impairment status was missed in 113 patients (16%). In 216/706 patients (31%), the changes detected with the EHF score were bigger than those revealed by the method of maximum grades.

**Conclusions :** The six components of the WHO disability grading may be added up to form a E(yes)H(ands)F(eet) sum score of impairment. This score can be used to monitor changes in impairment status in individual or groups of patients. It should be recorded and reported at least at diagnosis and release from treatment. Reporting could be done as the proportion of patients with improved EHF score, stable

EHF score and EHF score worse, and proportion of patients without impairment, proportion with WHO grade 1 and proportion with WHO grade 2.

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### Di 180

#### NERVE FUNCTION STATUS OF PATIENTS TREATED FOR NERVE FUNCTION IMPAIRMENT UNDER PREVENTION OF DEFORMITIES (POD) PROGRAMME IN AN URBAN LEPROSY PROJECT

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A Prevention of Deformities (POD) programme was introduced in a MDT programme of an Urban Leprosy Project of LEPRO India at Hyderabad. Under this programme, 1729 patients were assigned a risk grade of developing deformity and treated under POD. They were followed up through a standardized Nerve Function Assessment. The process involved detection of nerve function impairment at the earliest stages and administration of appropriate treatment for improving nerve function or containing the nerve damage. 459 patients showed impairment through this process. Nerve function assessment is done at the end of three years through the standardized procedure as a follow-up study to assess the nerve function status among these cases.

223 such patients were re-examined and nerve function status is recorded. The sensory perception of hands and feet are analyzed separately. Further improvement of sensory perception was recorded in 58% of hands and in 37% of the feet. 21 patients developed new ulcers during these three years.

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### Di 197

#### CLCP'S DISABILITY MANAGEMENT PROGRAMME (DMP) - A NEW MULTIPURPOSE SOFTWARE

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Built around the key modalities of disability preven-



tion and disability care services practised by our project for over a decade, the software works by feeding of twdsimple data forms provided with it, one for patients details and other for disability services rendered. Remark feature makes it convenient for data analysis from suspect to confirmed, MDT to RFT (including left area, defaulters, died). The Comments feature allow for storing your own notes, which appear in the history sheet of the patient. The disability charting (grade 0 to 2) at registration, at present and its improvement in any patient makes it a useful tool for public health persons to physiotherapists and surgeons to analyse the results. Integration of leprosy services with public health will also need close monitoring of the disability prevention, care and limitation services at grass root level. Therefore, data analysis for any given geographical area from PHC/SET to Taluka/Control Unit, District, State and National level can generate the reports in no time making monitoring of the entire programme easy. The Requirement Report makes strategy planning & resource allocation easier. The Report Register makes it easy to sort out all types of reports normally required by public health administrators. The Disability Analysis Report shows body part affected and its percentages among total cases as well as in the given population. The follow-up of patients, improvement or deficiency in disability prevention service coverage & quality of care can be analyzed quickly through Service Rendered Report and appropriate corrective actions can be taken. At a glance report provides for early recognition of reactions to prevent the disability and also offers cases with established disability for reconstructive surgery. DMP also has correction features for data entry and import export facilities making it user friendly. Our experiences with this new innovative DMP information system will be presented.

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### Di 199

#### **SELF CARE KIT' - A NEW FIELD AREA APPROACH TO EMPOWERMENT OF PATIENTS IN DOMICILIARY CARE**

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Deformities of feet in leprosy occur due to primary affection of nerves and /or due to anaesthesia. The changes in the lower extremity constitute the dry and/or ichthyotic skin following drug therapy, cracks in the feet and minor wounds to large ulcers. Neglect of injuries, inability to reach clinic for regular dressings,

poverty or inability to spend money on own care are other contributing factors which lead to chronicity and increased morbidity. The authors have devised and implemented a new approach to the care of feet with the Self-care Kit to empower patients with knowledge on domiciliary care for prevention of disability. Self-care Kit is a zippered bag containing antiseptic liquid, foot scraper, antibiotic ointment, a moisturizing cream, sterilized gauze, scissors, bandages and an adhesive tape. Step-wise empowerment training is given in the use of the self-care kit at Group Therapy session, which consists of use of the kit at home. Finally, patients are given the MCR footwear wherever indicated. Follow-ups show that after achieving cure or visualizing the good result by the use of the Self-care Kit, the patients feel more in control of their disabilities. At the field level, coming together of patients with different skin conditions and deformities at a group therapy session also act as motivating factor for practice of the self-care. Cost is low, especially when compared to the amount that a patient has to spend to reach the hospital daily for dressings. Presentation will show the results in various cases and an analysis of improvement in nearly 300 cases. In conclusion, the field area approach adopted for management of disabilities in feet with self-care kit is a simple and pragmatic solution for the vexatious problem of care of feet in leprosy. Its adoption at wider scale will benefit the leprosy program by truly empowering patients in self-care and prevention of disabilities.

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### Di 226

#### **THE ICIDH-2 AND THE CONSEQUENCES OF NEUROTHERAPY IN LEPROSY**

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Purpose:

- 1) To identify the main long-term consequences of peripheral neuropathy in leprosy, using the conceptual framework of the International Classification of Functioning and Disability (ICIDH-2, WHO, 1999) and
- 2) To present a few highlights of recent and current developments in this area.

The issues:

1. When detected and treated in time with corticosteroids, the primary impairments may be reversible. However, a substantial proportion of patients (11-51%) does not recover or gets worse. In addition, depending on the country and the programme, 33-56% of newly

registered patients already have clinically detectable impairments, often no longer amenable to drug treatment.

2. Among new patients, 6-27% present with secondary impairments, such as wounds, contractures and shortening of digits, usually preventable consequences of the autonomic, sensory and/or motor neuropathy. All people with impairments need careful and repeated teaching on methods to prevent further impairment and subsequent disability (POID). As yet, little is known about the number of people requiring such interventions.

3. Following such impairments many people experience limitation of activities (of daily living), formerly called disability, which can be (partly) overcome with the help of assistive devices, training, surgery, etc.

4. As a result of such limitations, or because of visible impairments or simply because of the diagnosis leprosy, many people are restricted in their (social) participation, formerly called handicapped. Around one third of them need rehabilitation interventions, such as physical or occupational therapy, reconstructive surgery or (temporary) socio-economic assistance.

Continued on next page

5. There are no routine information systems in place that collect information on these issues. A few tools exist to measure severity or extent of impairment, but these have not been widely used and are not used to generate cohort-based statistics. There are no agreed indicators for monitoring POID activities or rehabilitation interventions.

Recent developments :

WHO-led work in the field of rehabilitation has led to the drafting of the ICIDH-2, providing a conceptual framework for rehabilitation and the whole area of consequences of health conditions. Although experience to date is very limited, the conceptual framework appears very appropriate for leprosy. Based on the ICIDH, a new tool for assessing activities of daily living - the Green Pastures Activity Scale - was developed. The design of a participation scale is under way. A proposal for pilot studies on the usefulness of the WHO Disability Assessment Schedule (WHODAS II) with people affected by leprosy has been submitted to WHO.

Conclusions :

For many people, the long-term consequences of leprosy are more important than the disease itself. While these have been described and studied for many decades, as yet no conceptual framework has been adopted internationally that allows a holistic approach in the area of POID and rehabilitation. The ICIDH-2 offers such a framework, while at the same time greatly facilitating communication between those working in the field of leprosy and others working in other areas of prevention and rehabilitation. It is proposed that the ICIDH-2 be widely adopted as a frame-

work for classification of long-term consequences, targeting of POID and rehabilitation interventions, information systems for monitoring and evaluation and research.

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## Di 280

### AN EXPERIENCE OF CONTROLLING LEPROSY DISABILITY

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So far, the human being cannot effectively stop the occurrence of leprosy and impairment caused by the disease, but they can effectively drop down the disability happening through comprehensive POD measures. The author introduced an experience gained from the POD pilot areas in Jiangsu Province. Supporting based on local government, especially on the economic and administrative, we need to establish two systems and better relationship of them to fight against leprosy disability. One system is doctor team which includes professional staff and the part-time job leprosy doctors who service in, especially in surgical department, nerve department and dermatology of general hospital. Another system is the team of people affected by leprosy including new and cured patients. The part-time job leprosy doctors should be given leprosy health education and have to pass the examination of the leprosy knowledge, their tasks are detection for the first symptom of leprosy in new patients and referring these suspected patients to professional doctors. The professional staff should be responsible for patients on diagnosing & MDT treatment in time, giving psychological consultancy, offering neuritis detection monthly & treating neuritis with Predisone, teaching patients in reaction & neuritis feature clues, educating them self-care knowledge and helping patients to find causes of damage. The patients should understand the reason why and how the disability often happens in leprosy, remove the self scare, actively cooperate with his/her professional doctor to report clues of impairment and the development of neuritis or reaction treatment, insist on checking the key spot where it is easy to be injured and doing self-care everyday. In addition, the cured patients who benefited from POD and experience summed up by themselves against the disease can be further trained to aid other patients.

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**Di 294****THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING AND DISABILITY IN LEPROSY : THE ICIDH-2***J. W. Brandsma* -Pokhara, Nepal

The International Classification of Functioning and Disability (ICIDH-2, 1999), formerly the International Classification of Impairments, Disabilities and Handicaps, offers a framework that can facilitate the rehabilitation of persons affected by leprosy.

The classification is published and its use promoted by the World Health Organization. Rehabilitation is a dynamic multidisciplinary process, which often combines interventions of medical, social, educational and vocational disciplines to maintain or obtain and secure for a person who is experiencing certain consequences of a health condition, a respected and satisfying place in society.

Important aims of the ICIDH-2 are: to provide a scientific basis to understand and study the consequences of health conditions and to establish a common language for describing consequences of health conditions.

The ICIDH-2 defines and classifies health related conditions in three dimensions: Function and Structure (body level); Activity limitations (personal level), and Participation restrictions (socio-economic level).

The common (in)visible impairments in leprosy (claw-hand, loss of sensation, loss of eyebrows, etc.) are listed in the classification of Structure and Function. When as a result of leprosy (neuropathy) a person has difficulty in washing or dressing him/herself, or is not able to write or cook, the person has activity limitations. There are restrictions in participation when the person is not allowed to visit public places, experiences rejection, cannot find a marriage partner, etc.

The environment determines to which extent persons may experience activity limitations and participation restrictions. These environmental factors are also classified in the ICIDH-2.

A leprosy affected person commonly experiences consequences of the disease at all three levels. To be able to fully rehabilitate a person and assess to what extent selected interventions are effective, appropriate assessment instruments are needed.

The purpose of this presentation is to emphasise the role the ICIDH-2 can play in the rehabilitation of leprosy affected persons. In case studies, the use of the ICIDH-2 will be illustrated.

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**Di 315****TREATMENT OF PLANTAR ULCER IN LEPROSY***D.Chakraborty & T.Chakraborty* Society For The Welfare Of The Handicapped Persons, Durgapur, W.Bengal

Chronic ulcer, planter ulcer in particular is the serious outcome of leprosy. The conventional treatment of planter ulcer includes proper foot care and bed rest which seem to be not satisfactory to keep the patient active. The chance of healing of planter ulcer is remote if adequate rest of feet is not given in addition to routine treatment. To explore the other means of treatment to save the leprosy patient from disability a clinical trial was undertaken for a period of six months to study the effect of some selected homoeopathic medicine on healing of planter ulcer.

Thirty leprosy cured patient with planter ulcer were randomly selected for the trial. Ten patient were selected who have completed MDT. Other ten patients received only homoeopathic treatment. Five patients were selected for control study in both cases. None of the patients were advised for bed rest. Assessment of efficacy of the treatment was based on the volume of ulcer calculated from maximum length, breadth and depth of the ulcer at the time of first appearance, at three months and at the end of the treatment. All the patients of both study groups showed remarkable improvement and complete healing of the ulcer.

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**Di 355****THE DEVELOPMENT, IMPLEMENTATION AND FOLLOW-UP OF NATIONAL STANDARDIZED PREVENTION OF IMPAIRMENT/DISABILITY IN HANSEN'S DISEASE TRAINING COURSES FOR ALL 27 BRAZILIAN STATES***Linda F.Lehman, Hannelore Vieth, Maria Beatriz P.Orsini & Maria Leide W.Oliveira* Belo Horizonte, Minas Gerais, Brazil

The coordinator of CNDS of the Ministry of Health in Brazil requested a collaborative National Prevention of Impairment/Disability (POID) Project between the government and ALM in August of 1996, to start in 1997. This presentation will focus on the POID training courses currently being adopted in Brazil.

The essential components to be discussed are :

1. The recognition of the size of the HD problem in Brazil with 27 states and over 5,000 municipalities.

2. The recognition that POID is an essential component of Hansen's disease control programs (WHO).
3. The identification and selection of a project coordinator.
4. The identification and selection of a national POID advisory committee.
5. The identification of POID needs in training and supervision.
6. The consensus of a working definition for POID and essential POID activities and tasks.
7. The elaboration of two types of courses, one for training trainers/supervisors and the other for training local health care workers.
8. The elaboration of educational material and training methods.
9. The establishment of a strategy which would enable each state to have its own capacity to train and supervise POID activities with Hansen's disease control programs.
10. The development of evaluation criteria.
11. The identification of needed political and financial support required for a successful outcome.

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#### **BASIC ACTIVITIES AND SKILLS DETERMINED IMPORTANT IN PREVENTING IMPAIRMENT AND DISABILITY IN HANSEN'S DISEASE AND THEIR IMPACT ON TRAINING AND SUPERVISION IN BRAZIL IN 1997-2000**

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Brazil has 27 states and over 5,000 municipalities. It continues to have over 40,000 new cases of HD diagnosed yearly. The coordinator of CNDS of the Ministry of Health in Brazil requested - collaborative National Prevention of Impairment/Disability (POID) Project between the government and ALH in August of 1996. One outcome expected was to integrate essential POD activities into all HD control programs. Therefore it was necessary to identify essential activities and skills needed for preventing impairments and disability.

A consensus of basic activities and skills were developed by the National POID advisory committee combined with the results from four 1997 national supervisory training workshops. The combination represented disease control realities throughout Brazil.

Using these activities and skills, standardized training courses and systematic supervision were developed and implementation started in 1997. This presentation will also show the course content and objectives of two standardized training courses. One course developed for the trainer/supervisor and the other course for local health care workers. The skills learned in the courses are then followed up in systematic supervision activities. Supervision was felt to be the key component to maintaining and improving quality care as well as key to giving feedback for future training needs.

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### Di 30

#### **LEPROSY REHABILITATION**

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Chronic ulcer of the lower extremities (foot ulcer) is one of the most common problems of the leprosy patients. Its pathogenesis is the peripheral neuropathy and forms the neuropathic foot. All of these patients meet the doctors with chronic foot ulcer problems which sometimes turn to malignancy. The treatment of these chronic ulcers varies from conservative treatment to surgical treatment. However, in the severe ulcer which healing cause the scar, sometimes is unstable or inadequate tissue coverage after tumor resection. In the past, doctors used to do B-K amputation. Recently, many surgeons used the microsurgery technique to solve the problems.

In this report, we treat 11 patients since 1993-2000, age 40-71 yrs. We have 2 heel lesions, 4 forefoot lesions and 5 heel-lateral foot lesions. Seven cases are benign ulcer and four cases are malignant. All cases were treated by microsurgical technique; the donor flaps chosen in the series were groin (3 cases), radial forearm (2 cases), medial plantar (2 cases), rectus abdominis (2 cases), parascapular (1 case), gracilis m. (1 case). Average operative time is 6 hours. After 6 mths - 5 yrs. follow up, all patients get good result. In the malignant cases, the post-op radiotherapy can be achieved without any complication. From the report, the lower extremities salvage in leprosy patients by microsurgical technique is an alternative line of treatment without severe complication.

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### Di 31

#### **BACTERIOLOGICAL STUDY OF PUS ISOLATES FROM NEUROPATHIC PLANTAR ULCERS ASSOCIATED WITH ACUTE INFLAMMATORY PHASE**

*Gigi J Ebenezer, Sheela Daniel, Sujai Suneetha, Esther Reuben, Parthebarajan S & Samuel Solomon*

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Plantar ulceration of the foot is a common secondary complication in leprosy and is one of the major reason for morbidity and repeated hospital admissions in leprosy and diabetic care centres. Microbial flora of the infected wound is varied and show differing antimicrobial susceptibility patterns. This study compares organisms infecting leprosy plantar ulcers with those plantar ulcers of other etiologies and their drug susceptibility patterns.

This is a study of 86 patients with infected plantar ulcers who had pus culture and sensitivity. 55 patients had leprosy, 13 patients had leprosy and diabetes, 12 patients had diabetes and 6 patients developed plantar ulcers due to other causes. 64 were males (74.4%) and 22 females (25.6%). A total of 267 organisms were isolated from these patients ranging from single organism in 3 patients and 5 organisms in 8 patients. Multiple isolates were grown in most of the patients. The most commonly isolated organism was *Proteus* species (chiefly *Proteus mirabilis*) which was grown in 53.4% of the patients. This is a significant finding considering that other studies had found *Staphylococcus aureus* to be the most common organism isolated. *Enterococcus* was the second (47.6%) commonest organism. *Staphylococcus aureus* was the third (43%) commonest organism isolated. The other organisms isolated were *Pseudomonas aeruginosa* in 20.9%, *E coli* in 18.6%, non - fermenting gram negative bacilli in 15.1%, *enterobacter* and *citrobacter* species in 10.4%. These isolates highlight the fact that plantar ulcers are prone to faecal contamination. *Clostridium tetani* was not isolated from any of the patients.

In general, the profile of organisms grown from diabetic ulcers was quite similar to that in leprosy patients.

Sensitivity of the organisms to various antibiotics will be presented and discussed.

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### Di 82

#### **A PRELIMINARY REPORT ON THE USE OF LASER IN THE TREATMENT OF PLANTAR ULCERS IN LEPROSY**

*Joshua J, John A.S., Mahato N & Bansriar S* The Leprosy Mission, Calcutta

A case control study is underway at the Premananda Memorial Leprosy Hospital to assess the usefulness of LASER therapy in the management of plantar ulcers in leprosy. The aim is to see if there is a significant increase in the rate of healing, if LASER is incorporated as a modality of treatment. Low intensity LASER has been a popular modality of treatment of open wounds despite the fact that there is wide disagreement regarding its usefulness and the method of its application.

In our study 25 patients with simple plantar ulcers are to be used as cases and another 25 as controls. We have standardised a protocol for the treatment of simple plantar ulcers. Only patients with simple plantar ulcers are chosen for the study. All ulcers are measured to note their area, and the foot is immobilised in a below knee plaster cast with a window for the ulcer to facilitate alternate day dressings. The patients in the control group are treated thus and those in the group to receive LASER therapy, have their ulcers subjected to radiation by a HeNe LASER beam of 685nm, at an energy level of 4J/sq cm of ulcer area, for a period of 20 minutes each sitting, three days week. The selection of cases and the method and materials used and the results are presented. The rate of healing of similar sized ulcers among the controls and the cases under LASER therapy are compared and presented as a preliminary report.

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### Di 134

#### **REVIEW OF RESULTS OF EXCISION ARTHROPLASTY FOR SEPTIC ARTHRITIS OF METATARSOPHALANGEAL JOINTS AS A COMPLICATION OF PLANTAR ULCERATION IN LEPROSY**

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30 patients who had septic arthritis of the metatarsophalangeal joints as a complication of plantar ulceration in leprosy who underwent excision arthroplasty and primary closure of the plantar ulcer were reviewed. 22 of these patients were male. The common-

est site of MTP joint involvement was the 1st MTP joint. The average size of the ulcer was 2 cms. and the shape of the ulcer was usually oval. Diagnosis was made on the basis of signs of infection over the MTP joint, discharge from the ulcer and examination with a probe. Infection in the joint ranged from simple synovial discharge to seropurulent or purulent discharge.

Treatment was done with excision arthroplasty of the MTP joint, excision of the ulcer with primary closure of the plantar incision and dorsal or lateral drainage. In 2 patients, the plantar wound could not be closed as the wound was too large. The healing of the plantar incision took place in 2 weeks in 12 patients and 3 weeks in 14 patients. In 4 patients, healing did not occur by primary intention. In a follow up of 1-2 years, there was no recurrence in 24 patients and 4 patients had recurrent simple ulceration. 2 patients were lost to follow up.

Review of the results of this procedure dealing with septic arthritis of MTP joints secondary to plantar ulceration shows that primary healing of plantar incision could be achieved in three weeks time. As regards to recurrence, even though only 4 out of 28 ulcers treated by this procedure recurred, other contributing factors will have to be considered in a prospective control study to support the view that this procedure has contributed to non-recurrence.

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### Di 160

#### **FOOTWEAR FOR LEPROSY AFFECTED PERSONS WITH GRADE-I DEFORMITY - THE PROCESS AND OUTCOME IN MAKING NEW MODELS**

*Justine Bolton, Palande D.D., D.Rajesh, Narasimha Rao & Premanidi Limma Secunderabad*

Proper foot care in leprosy is very important. Many people develop ulcers because of the improper care of the anesthetic feet. There are many problems with usage of footwear among leprosy patients. Many times, the footwear is not being worn due to various reasons and at times footwear models are unsuited to the foot condition.

A scientific attempt is being made to correct the problems associated with the footwear for patients with Grade - I disability. After understanding the problems with the existing footwear models, new models are designed by scientists in shoe development. These footwear are field tested among the potential users. With the recommendations from the field-testing, the models are again modified.

The problem with the existing footwear, the procedure in designing the models, the field-testing procedure, its recommendations and the latest models are discussed in this presentation. Other agencies working in leprosy control also could do similar studies to design footwear, which promote usage among the community. In any POD programme, ensuring proper footwear usage is the key to foot care.

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### Di 177

#### **DESIGNING AN INTERVENTION MODULE FOR PREVENTION OF PLANTAR ULCERS IN THE POST ELIMINATION PHASE**

*Dr.J.Raghavendra Rao, R.D.Gaikwad, R.J.Lokhabde, Dr.(Mrs.)S.Edward & Dr.V.K.Edward*

Richardson Leprosy Hospital, Miraj, Maharashtra

Planter ulcers in anaesthetic feet by far account for the largest number of patients getting disabled due to leprosy with added socio-economic disadvantages. They account for the largest number of admission in leprosy hospitals and gobble up a large chunk of the available resources - staff time, material and money.

In several places where elimination of leprosy is already achieved or is in sight of being achieved, programmes are being designed to adapt to a state of integration of leprosy services into the primary health care system. POD is one of the acknowledged main thrust components of these programmes. While designing a package for implementation of POD activities including training, it is essential to understand the factors that contribute to prevention / occurrence of ulcers in anaesthetic feet.

31 patients attending the OPD of Richardson Leprosy Hospital, Miraj between 1996-99 had sole sensory loss. 41 patients with sole sensory loss (without ulcers) were admitted into the wards during the same period. Apart from these 50 randomly selected age and sex matched patients who reported with plantar ulcers during the same period makeup the groups under study. These three categories of patients will be analyzed for the association between type of leprosy degree of anesthesia, occupation, steroid therapy, protective footwear, hospitalization and health seeking behavior and the occurrence of plantar ulcers.

Based on the resulting analyses intervention modules for POD, and training will be designed and presented for discussion.

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### Di 214

#### USEFULNESS OF THE PATELLAR-TENDON-BEARING ORTHOSIS IN PREVENTION OF RECURRENCE OF PLANTAR ULCERS IN SMALL-SIZED FEET OF LEPROSY PATIENTS

*Samuel Solomon & Partheebharajan S* Schieffelin Leprosy Research And Training Centre, Karigiri, Vellore District, Tamil Nadu

The PATELLAR-TENDON-BEARING (PTB) ORTHOSIS or PTB is a device that is intended to transfer body weight onto the patellar tendon, thereby particularly relieving the sole of the foot from weight-bearing function, and is to be prescribed to patients with reduced plantar surface area. 133 PTBs had been issued for patients between 1991 and 1997. These records were reviewed. The distribution of ulcers was as follows : Fore foot=40, Mid foot=14, Hind foot=38, Lateral Border=27. Pre-existing deformities at the time of issue of PTBs were distributed as follows : Inversion=8; Rocker-bottom=23; Ankle instability=3; Short foot=35; Others=17. The condition of the contralateral foot and the footwear being used on that foot showed a distribution as follows : Flat foot=9; Short foot=6; Below-knee amputation=3; Bilateral PTB=3; Minor abnormality=18; Relatively normal=94. The results of utilisation of PTBs in reduction of recurrence of ulcers was monitored by computation of the ulcer rate for two years immediately before and after the issue of the PTB. It was found that 44/133 (33%) of patients had improved. A similar number (43/133) did not deteriorate in the ulcer rate after using PTB. Further detailed review of these results will be presented.

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### Di 262

#### EFFICACY OF SELF-CARE FOR PLANTAR ULCER IN 43 CASES OF LEPROSY

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Objective : To evaluate the effect of self-care for plantar ulcer.

Methods : According to Zhang's guideline in nursing anesthetic feet by patients themselves. We trained patients in self-care knowledge, monitored them regularly and offered them necessary equipments.

Results : Ulcers reduced from 43 cases (50 spots) before nursing to 15 cases (18 spots) and with a cure rate of 65.12% (64.00%).

Conclusions : The way of self-care is more efficient for them. The author suggests them reducing the intensity and modifying the manner in work and keeping nursing in their whole lives.

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### Di 310

#### FOOT CAMPS: EXTENDING DISABILITY CARE TO THE PERIPHERY

*Mark Macdonald, Jaganath Mahajan & Sharan P.Ruchal*

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Community based skin camps have traditionally been performed, by visiting specialists, as a means of detecting new cases of leprosy and its complications, and assisting in ongoing management and care.

Except in high prevalence areas, these result in detecting few new cases.

A new initiative with a broader range of objectives, concentrating on lower limb problems in leprosy, was tested. The objectives included a) Provision of disability care : treating simple ulcers, providing footwear, referral for re-constructive surgery and education in self care of neuropathic impaired foot. b) Detection of new cases c) Evaluating level of health knowledge and instigating a problem solving approach.

Seven community based foot camps over a nine-day period were conducted by a multidisciplinary team from a tertiary referral hospital, in Nepal. Camps were conducted at government health posts in both hill and plain areas. A total of 452 people were seen including 206 (46%) leprosy affected people and suspects. Twenty new cases (4%), were found including two diagnosed by positive biopsy. Six defaulters (1%) were recommended on MDT. Of those affected by leprosy two-thirds received footwear or orthoses and 24 (12%) were referred for re-constructive surgery. In addition, an assessment of the level of health knowledge, with regard to self care of leprosy affected feet, was made in 42 patients and advice was given using a participatory problem solving approach. The outcome of this successful new initiative was detection of many new cases as well as provision of disability care at periphery. This model could be used in other areas with high prevalence rate and high disability proportion.

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**Di 18****REOPERATION IN FAILED CORRECTION OF FOOT-DROP**

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**Short Introduction**

Post-operative failures and corrective surgical procedures / reoperations dealt with

**Failures**

- 1) Slackening of the transfer correcting foot-drop
  - a) lateral transfer tendon slip
  - b) medial transfer tendon slip
  - ) medial and lateral transfer tendon slip

**Corrective Procedure**

Retightening at relevant suture level.

- 2) Slackening of transfer and retraction of (a short) tendon transfer not allowing retightening, but muscle of transfer acting.

**Corrective Procedure**

Muscle of the transfer made functional using Tibialis Anterior Tendon as graft to repair the distal defect of the transfer correcting the failure of foot-drop correction (Innovation).

Transparencies are used to show the procedures, which correct the failures of earlier attempted foot-drop correction.

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**Di 63****PREVENTION OF HAND DEFORMITY - 'A CHALLENGE IN LEPROSY CASES'**

**Dr.Sajid Hussain**, Central JALMA Institute For Leprosy, Agra

Peripheral nerve involvement is commonly seen in leprosy. This causes the sensory and motor loss in limbs. End result is clawing of hand. It has been observed that the decompression of these nerves at an early stage of occurrence of signs & symptom can help to prevent the deformity.

Keeping this view in mind, in last ten years, the cases of ulnar & median nerves referred to us which showed neural symptoms were undertaken for nerve decompression. The sensory & motor status was recorded preoperatively as well as post operatively and every four weeks. The Electro Physiological studies were also undertaken, pre and post operatively.

In this paper, we will discuss the follow up results of

ulnar & median nerve decompression and also the merits and demerits of these procedures.

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**Di 131****CAN DEFORMITY CORRECTION BE DONE AT MANY MORE LEPROSY CENTRES?**

**T.S.Narayanakumar & T.Kirubakaran Samuel Raj** Kumbakonam

Reconstructive surgeries for correction of deformities in the leprosy affected were done only at well organised surgical units in few leprosy centres. As all those who had deformities could not avail the benefits of surgery due to their inability to stay longer at far off centres, it was proposed to conduct surgeries at selected leprosy centres where facilities were available or could be made available. Two such centres, namely CULES Hospital, Coimbatore and Kasturiba Kushta Nivaran Nilayam, Mazhavanthangal in Tamilnadu, supported by GLRA-ALES, were identified to organise reconstructive surgeries, on trial basis.

Field staff and physiotherapists were given orientation to identify, select and prepare patients for surgical correction, under the guidance of medical officers. The available infrastructure were utilised with modifications and supplementations wherever necessary. Surgeon and theatre staff from a referral hospital visited the centres with required instruments and carried out surgeries for as many as 14 patients, most of whom would not have had surgeries elsewhere. Encouraged by this experience, we have planned to organise surgery programmes at some more centres, supported by GLRA-ALES.

As large number of persons are in need of surgical corrections and since number of centres with facilities to operate are far less, there is a need to promote performing surgeries at many more centres, by improving available infrastructure and mobilising support from other centres, without compromising the basic requirements for reconstructive surgery. In this paper, we share our experience and discuss the advantages and methods of promoting surgery programmes at different centres.

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**Di 140****A COMPARATIVE STUDY BETWEEN CLAW HAND FOLLOWING RE-CONSTRUCTIVE SURGERY AND NORMAL HAND**



**Victor Joseph Paul** The Leprosy Mission Hospital, Naini, Allahabad

**Objective :** To study the functional and cosmetic outcome of claw hand following Zancolli Lasso surgery and compare the outcome with the normal hand.

**Design :** 50 subjects (control) with normal hands and 200 subjects (study group) who had had Zancolli Lasso surgery from 1998 to 2000 January were randomly selected. Controls were assessed for hand functions and range of movement of small joints of the hand. For the study group, from retrospective data available, data on hand functions and range of movements of small joints of the hand up to 3rd week post-operative and first follow-up (3 months after discharge) was taken for the study.

**Setting :** The Leprosy Mission Hospital - a large referral centre at Naini, Allahabad, Uttar Pradesh, India

**Participants :** Controls from relatives of patients/non-leprosy patients with normal hands and study group from leprosy in-patients at The Leprosy Mission Hospital, Naini.

**Results :** Will be discussed in the presentation.

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### Di 313

#### POLLICIZATION OF THE INDEX FINGER IN A SEVERELY DEFORMED LEPROSY HAND

**Prashant Murugkar & Friedbert B.Herm** Green Pastures Hospital, Pokhara, Nepal

The 41 year old male patient Jit B.R. was admitted to Green Pastures Hospital with BT type leprosy, disability grade 2 for both eyes, hands and feet, a corneal ulcer and peripheral ulcers. Except for the middle finger all fingers of the left hand were shortened to the length of the proximal phalanx and the thumb was shortened about 50% of its original length. Metacarpophalangeal joint disintegration of the index was seen in the x-ray of the left hand. Grip and pinch function of the left hand were completely insufficient for ADL activities.

Operation was planned after MDT treatment was completed and all ulcers had healed. Under axillary block anaesthesia the shortened left index finger was islanded with its artery and vein. It was then moved into position and fixed to the proximal phalanx of the thumb using an axial K-wire. Loose tagging sutures were done to close the incisions and a posterior splint for immobilization was given. After one week the islanded pedicle flap was still well circulated and a thumb spica splint was applied in order to increase the

first web space. Skin grafting of the web space was done after 3 weeks and an opponensplasty using one of the intact FDS tendons is planned to further restore the grip and pinch function.

In summary this case study reveals the importance of tertiary referral facilities where plastic and reconstructive surgery can be performed for severe leprosy grade 2 disability. The index of Jit

B.R. s left hand would have been just amputated in a district hospital.

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### Di 318

#### THE ACCEPTABILITY OF PROSTHETIC REHABILITATION AMONG LEPROSY PATIENTS

**Sharan Prasad Ruchal, Narendra Khadka, Sanju Ruchal & Mark Macdonald** Anandaban Leprosy Hospital, Kathmandu, Nepal

More than 100 leprosy and non-leprosy patients had below knee amputations (BKA) at Anandaban Leprosy hospital, Nepal, over the past 18 years. These patients were fitted with prosthesis. All disabled people with prosthetic limbs face difficulties in their daily lives. We are concerned that people affected by leprosy may have additional difficulties with an artificial limb, on account of other complications of their disease and associated stigma.

This study prospectively interviewed 40 people (in both groups), with previous BKA, to review problems of daily living, acceptability of prosthesis, and difficulties with ongoing maintenance. We also sought to determine how acceptable the prosthesis are to the patient s family and society, in order to see if leprosy patients suffer more social stigma than non-leprosy patients with the same disabilities.

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### Di 319

#### ASSESSMENT AND RESULTS OF OPPONENS REPLACEMENT SURGERY

**Richard Schwarz,** Green Pastures Hospital, Pokhara, Nepal

Anandaban hospital as one of the 2 tertiary leprosy referral centres of Nepal offers a broad spectrum of reconstructive surgery services. The author has been working as a consultant reconstructive surgeon in both referral centres. The following study was conducted in Anandaban Hospital.

All patients undergoing opponens replacement surgery between Jan/1987 and Dec/1997 were reviewed. Adequate records were found on 156 operations on 134 hands on 115 patients. Average age was 30. FDS reconstruction was done in 93% of primary reconstructions, and was combined with intrinsic replacement in 38%. Overall pinch grip (to which finger the thumb could be opposed, where index finger = 1 and little = 4) improved from an average of 1.1 to 2.8. Opponens gap (gap between base of first and fifth metacarpals on full opposition) decreased from 52.5 mm average to 38.4 mm. Patient satisfaction was graded as good in 74% and fair in 19%. Of note is that 55% could not achieve any pinch grip pre-op which was reduced to 11% post-op. Older patients had similar results as younger. The addition of intrinsic replacement procedures did not adversely affect the outcome. There were 23 complications. Those undergoing opponens revision procedures reported good patient satisfaction in 57%.

In summary, opponens replacement surgery is a highly successful procedure which can be combined with intrinsic replacement with ease. Secondary reconstruction is less successful but gives satisfactory results in about half the cases. Grading patient satisfaction is an important part of the assessment as this is a very real sense in the ultimate measure of success.

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### Di 320

#### SURGERY FOR TRIPLE NERVE PALSY

**Richard Schwarz**, Green Pastures Hospital, Pokhara, Nepal

Green Pastures Hospital and Anandaban Hospital both serve as tertiary leprosy referral centres in Nepal offering reconstructive surgery services. The author has been working as a consultant surgeon in both institutions. The following study was conducted in both hospitals.

A retrospective review was carried out on all patients undergoing surgery for triple nerve palsy from 1977 to 1999 inclusive. Twenty-one charts were available. All 21 patients underwent wrist extension procedures with successful (excellent or good) results in 78%. Sixteen underwent EDC reconstruction with 85% success, and

90% of 13 patients undergoing thumb extension procedures had excellent or good results. 63% of those undergoing intrinsic replacement were successful, and 63% of those undergoing thumb opposition procedures were successful. Nine patients developed complications.

It is believed that triple nerve palsy is a severe disability, and multiple operations with a high overall complication rate are necessary. However, results with appropriate surgery are rewarding. Expert physiotherapy seems to be absolutely necessary.

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### Di 391

#### RECONSTRUCTIVE SURGERY AT PERIPHERAL CENTRES

**Dr.D.Vijaya Kumar** The Leprosy Mission Hospital, Delhi

Though the prevalence and duration of treatment for leprosy has decreased in the last few decades, there remains a larger number of patients with a legacy of deformities due to leprosy, which are a very serious socio-economic problem. A large proportion of these patients would benefit from reconstructive surgery, but have no access to the few highly specialized referral centers where it is available. So Freedom from Deformity remains only a distant dream for many patients disabled by leprosy.

With these patients in mind, The Leprosy Mission has evolved a strategy of visiting reconstructive surgeons performing operations at peripheral / rural hospitals with basic surgical facilities, so as to reach a larger number of patients over a wider area. This effort has been successful and over the last few years many patients who would otherwise have struggled with their deformities throughout their lives have been able to avail of the benefits of reconstructive surgery.

The experiences presented here are derived over a period of 5 years from 1995 to 1999 during which 730 operations were performed by the author in different centers in Andhra Pradesh, Tamil Nadu, Maharashtra, and West Bengal.

The author presents his views on how reconstructive surgery can be provided to patients in remote, rural areas with judicious use of modified techniques, limited technical facilities and staff available at peripheral hospitals.

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**Di 415****PREVENTION OF DEFORMITIES AMONG NEWLY DETECTED CASES WITH THE HELP OF NERVE FUNCTION ASSESSMENT IN AN URBAN LEPROSY PROJECT**

*S.L.Narasimha Rao, Ranganadha Rao P.V., Pratap Reddy, Mohammed Shamsuddin, Sukumar Samson & Swamy Reddy G Secunderabad*

MDT programme was started in Hyderabad city with SET strategy by LEPRO India. Covering a population of 1.5 million people in the city, 2565 cases were detected in the project from 1995 to 1999. A prevention of deformities programmes was added as an integral component of MDT work in this project. This includes systematic examination of nerve function with the help of sensory examination voluntary muscle testing (VMT) and palpation of nerves. The sensory examination was done with Semmes Winsten mono filaments. VMT was graded using MRC grading. Palpation to detect tenderness of nerve was also included in the nerve function assessment procedure.

199 patients were found to be having neuritis with nerve function deficit. Only 11.5% of the patients have shown signs of reversal reaction in the skin and nerve impairment. In these cases redness of the skin lesions has indicated the reaction in the nerve. 51% of these patients had no skin signs and nerve tenderness, but presented nerve function deficit. Relative incidence of silent neuritis and recovery of nerve function among these groups of patients with standardized steroid therapy and physiotherapy assistance are discussed in the presentation.

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**Re 40****REHABILITATION OF LEPROSY SUFFERERS LIVING IN LEPROSY COLONIES**

*Deepak Devalapurkar, Suresh Shipurkar & Balkrishna Jagtap Shendapark Leprosy Hospital, Kolhapur*

**INTRODUCTION**

Every deformed or disabled leprosy sufferer lives a debilitated life. But the problems of disabled leprosy sufferers living in their houses or in organised leprosy institutes are comparatively easier than those of living on pavements or in leprosy colonies with earning their living either by begging or by illicit or illegal means. In view of this we have been trying to solve the problems of leprosy sufferers living in leprosy colonies as follows .

**ACTIVITIES**

A) On state level : Majority of leprosy colonies in Maharashtra were visited several times and the representatives were encouraged to come together and form a federation for solving their problems.

B) On local level : Welfare and rehabilitation activities undertaken for self settled inhabitants at Kolhapur (Maharashtra) by us were : 1. Movements and follow-up activities for obtaining civic amenities, such as electricity, water, latrines and building of roads.

2. Interest free loan for building materials for 40 families. 3. Plantation of trees on every plot individually owned and about 350 trees on common land. 4. Encouraging use of smokeless chulhas. 5. Giving legal help / acting as arbiter for restoring legal rights to family properties. 4 persons were actually benefitted out of 12 helped. 6. Financial help / low interest loans for buying milk yielding animals, sewing machines, etc. and starting trade and business was given to 17 persons. 7. Getting employment, 3 got jobs out of 6 tried for.

8. Employment as farm labourers for 16 persons. 9. Medical help and counselling for all.

10. Providing educational material for school going children.

**CONCLUSION**

1. We were able to succeed in preventing 39 leprosy patients and 23 healthy contacts from begging on roadside. Still there are 89 leprosy patients who go on begging for their

Continued on next page living.

2. Begging being easy and lucrative profession, it becomes very difficult to turn the leprosy sufferers away from this vocation. Disability becomes the mean of earning.

3. It is difficult to enforce even a semblance of discipline and even one eccentric inhabitant can disrupt the whole programme.

4. It became easier to help the inhabitants help themselves through the agency of state level organisation.

5. Though the problems of leprosy sufferers are varied, complex and complicated, a concerted effort, individually and organisationally would help to alleviate their hardships.

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**Re 43****SOCIO-ECONOMIC REHABILITATION PROGRAMME IN AN URBAN LEPROSY PROJECT - METHODOLOGY AND RESULTS**

*Esther Edward, Sukumar Samson, V.Prabhakara Rao & B.Pratap Reddy Secunderabad*

As a result of MDT in leprosy, there has been a vast reduction in active caseload, with reduced need for inputs to tackle active cases. Rehabilitation of the leprosy cured has received its due importance in the recent years.

LEPRA India started socio-economic rehabilitation programme in its projects in the year 1997 with a holistic approach that has been evolutionary, developmental and participatory. HYLEP is one of the six direct projects of LEPRA India, where SER activities were started since three years. The methodology of implementing this programme comprises of need assessment of affected persons, prioritization of needs and planning for appropriate interventions.

After identifying the clients, the family and community are actively involved in selection of self - supporting schemes, working out the business plans providing the economic assistance to start the ventures and follow up to see that the schemes are sustained. The ultimate objective is to see that the client is reintegrated into a normal family and social life.

The author proposes to discuss the methodology adopted in an urban situation, the achievements, the system of follow up and the impact of rehabilitation services in restoring normal social and family environment to the clients.

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**Re 53****COMPUTER BASED REHABILITATION OF THE HANDICAPPED - AN EXPERIMENT IN A MUMBAI SLUM**

*R.Ganapati, S.Kingsley, V.V.Pai, Shakir Khan & T.P.Mirajkar Bombay Leprosy Project, Mumbai*

Computer technology of late has revolutionized human life structure, creating unlimited job opportunities. This computer frenzy has profoundly influenced particularly the life style of youngsters who are in the race to become qualified computer professionals. We have found scope for using this phenomenon in the field of rehabilitation. Conventional methods of rehabilitation of the rural disabled may sharply differ from urban techniques. In this computer age, this contrast is even more striking. As literacy levels are admittedly higher among urban-

ties, the computer technology is penetrating even into the heart of the slums. Computer literacy as a qualification for job prospects becomes the felt need of normal individuals as well as the physically disabled including leprosy victims living in the slums.

As the handicapped youth should not be marginalized in this healthy competition, we have created learning opportunities in a computer-training centre located right within the slums, where we had earlier identified leprosy patients as well as other handicapped. Each individual's training fees were raised through public donations. A year-long experiment in offering computer-based rehabilitation to the patients of leprosy as well as other physically disabling diseases in an integrated manner is summarized taking advantage of a computer-training centre in a slum of North Bombay. 15 trainees belonging to the economically backward strata who had completed the minimum qualification of secondary school education (10th Standard) were admitted for 6 months training in computer technology.

A questionnaire study of 15 trainees, first aged 18-23 (5 females) who had passed their school finals (3 now doing diploma courses) indicated the fulfillment of their felt need for career prospects. After completing the training some of the first batch of trainees are assisting our project by punching and analyzing the data of leprosy patients needed for research using a customized software, while some others are rehabilitated elsewhere. After these trainees have attained proficiency in computer technology, they are trained to handle sophisticated computers, scanners, etc. at our documentation cell, where they offer invaluable assistance in our research and scientific activities. These trainees are even trained in formatting and processing digital images of leprosy patients using digital camera and professional edition of computer software. This preliminary experiment, which is highly encouraging, is being enlarged to include a larger group of patients in other slums.

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**Re 59****REHABILITATION OF LEPROSY PATIENTS BY PSYCHO-SOCIAL COUNSELLING**

*Dilip Gole, Madhukar Neet & V.V.Dongre The Society For The Eradication Of Leprosy, Mumbai*

Our organization is working since 1982. In the last 19 years, we came across 13 smear +ve patients with deformities and recurrent lepra reactions who were bored to death and had suicidal tendencies.

We counselled them, their friends, their relations, their family members without interruption to keep up their



morale high. They were from different states of India. 4 were Maharashtrians, 3 from Uttar Pradesh, 2 from Andhra Pradesh, 2 from Bihar, 2 from West Bengal. We helped them in getting financial support from philanthropic organizations and persons. In the last few years we find that all of them are doing well in their trades and their standard of living has gone up. On an average, the annual income of each one of them is approximately Rupees 60,000/-. Some have employed servants too.

Such successful stories are to be given due publicity on electronic media, so that people will feel that there is life after leprosy.

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### Re 86

#### COMMUNITY BASED REHABILITATION OF PHYSICALLY HANDICAPPED INCLUDING LEPROSY DISABLED CASES - A REPORT

*Suresh Kalekar, Sandeep Joshi & Uday Thakar* Acworth Leprosy Hospital Society For Research, Mumbai

In view of minimizing leprosy stigma, an attempt has been made to practice Community Based Rehabilitation for leprosy and non-leprosy physically handicapped persons in a combined program.

In taluka Panvel, 29 physically handicapped persons (4 with leprosy and 25 without leprosy) were identified during routine leprosy survey conducted by leprosy field workers covering 13150 population.

This report presents and discusses an account of efforts further taken to :

1. arrange Handicap Certificates to the disabled,
2. evaluate their rehabilitation needs with the help of experts,
3. arrange for their vocational training,
4. provide financial assistance

The entire rehabilitation programme could be possible due to active community participation.

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### Re 111

#### THE ROLE OF FAMILY AND COMMUNITY IN REHABILITATION OF LEPROSY AFFECTED - AN IMPACT ANALYSIS

*Narayan Mallick, Guchhait, P.S.V.Ramakrishna, D.Jaganadha Naidu & V.Prabhakara Rao* Secunderabad

The concept of rehabilitation has undergone a change in recent times with emphasis on participation of family and community for the socio-economic enablement of affected persons.

LEPRA India has started rehabilitation programmes as a focused activity with emphasis on involvement of the client, family and community from the initial stage of need identification till the normal socio-economic environment is restored to the client. BOLEP is one of the 6 projects of LEPRA India where SER activity is implemented since 3 years. In the project supported by I SERO to implement this programme. In the entire process of need assessment, prioritization and interventions, the family and community are involved. Village Rehabilitation Committees were formed to review needs, suggest interventions and assist in follow up to make the interventions sustainable.

Clients were provided assistance both from Government and LEPRA India funds. The positive results of this programme were largely due to the participation of family members and community in which clients have successfully integrated themselves.

The impact of the support of the family and community in the sustainability of the self supporting schemes of the clients was assessed with the help of interview schedules administered to the family and community members and presented in this paper.

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### Re 128

#### THE USE OF SELF-HELP GROUPS IN SOCIO-ECONOMIC REHABILITATION OF WOMEN AFFECTED BY LEPROSY

*Aarti Nagaraj*, MESH, New Delhi

Ours is a society with a male oriented value system. The contribution of women to the development of our social system largely remains unacknowledged and unappreciated. Women, particularly those affected by leprosy, play only a secondary role in the organisation of their communities. Initiative and autonomy are unknown to most of them.

This paper poses the vital question Are we satisfied with the efforts being made for the rehabilitation of women affected by leprosy? We understand that the phrase women affected by leprosy refers to not only the women who are physically afflicted by the disease, but also those who are so by virtue of being a spouse or an offspring of a person who has leprosy. The lives of women, not physically afflicted by the disease, may be affected just by the fact that they reside in leprosy colonies. Any action to promote equalisation of opportunities in development must take into account the fact that certain groups of persons with disabilities are more marginalised than others, and tend to be left out unless specific actions are taken to include them. This paper challenges the notion that specific efforts made would further segregate or marginalise them, and argues that efforts towards the rehabilitation of leprosy affected women would be beneficial in their gradual entry into the mainstream activities.

We argue that the social and economic integration of persons affected by leprosy is an important means for promoting human dignity, reducing stigma, increasing economic independence and efficiently using limited community resources.

MESH, Maximising Employment to Serve the Handicapped, has been instrumental in initiating a development programme for the women of three leprosy colonies near Delhi. This paper draws on that experience suggesting that the best way to work and achieve results is the group method. We also examine how the women's groups or mahila mandals, act as platforms for action and change, in the family as well as the community. MESH acts as a catalyst towards self-help and eventually self-reliance.

We conclude that our development endeavours towards total empowerment of women: economic independence, awareness, self confidence to demand social and political changes, will bear fruit only when the leprosy affected women are included in the general scheme of things.

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## CI 157

### THE ECONOMIC ADVANCEMENT MOVEMENT IN KOREA - REHABILITATION

*Sang Kwon Jung*, IDEA International For Socio-Economic Development, Seoul, Korea

The Economic Advancement Movement (EAM) in Korea has uniquely compared to other countries and has received attractive attention from many all over the world. This is a remarkable movement - winning out on two fronts: medical treatment and social aspects. Both of them are key in eliminating Hansen's Disease (H.D.). By creating a framework of self-support and govern-

ment support, those who were fit for work escaped from living in a group and/or being compulsorily segregated, took the first step for EAM in Korea. However, we encountered many problems, but solved within the current system centering around government and academic circles. Once a forceful crackdown on begging increased, taking these problems into our hands with an internal clean-up, we were able to restore dignity by ourselves which was the beginning of EAM.

With the implementation of this project, Han sung Co-operative Association (HCA) was established and incorporated by the government. We have achieved self-support with 30 years of painstaking efforts and assistance from others, whose goal is elimination of H.D. Currently we are deeply involved in Korea government's policy decisions on H.D., freely extending our opinions.

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## Re 410

### SINGAPORE LEPROSY RELIEF ASSOCIATION - HISTORICAL ACCOUNT AND FUTURE PERSPECTIVES

*Tan F.P.C., Oon B.B. & Law J* Singapore Leprosy Relief Association, Singapore

When it was founded in 1951, SILRA provided financial and other assistance to leprosy patients and their family members when compulsory admission of all patients was required by law. Following the advent of dapsone, and patients were discharged, the main problem was to provide accommodation to the discharged patients who had no home or family. The need of the patients progressed from the simple food and lodgings to luxuries like recreational activities as they demand to be treated equally like any normal individuals. The implementation of the MDT drastically reduce the need of the Home. However, the present population of patients will continue to require rehabilitative services for another 20 years.

As leprosy ceased to be a public health problem, SILRA will turn its attention towards the alleviation of the misunderstandings among the general public. Effort to ensure that the remaining few new cases each year will not be missed due to the complacency of the medical professions will include emphasis on teaching at all levels and keeping up to date a centre for referral and treatment of leprosy in Singapore. Together with the government's effort towards globalization, the planned new centre of SILRA, to be completed in 2002, will have a unit to cater to the training of leprosy workers in the countries of high endemicity in the diagnosis of common skin diseases and tropical diseases.



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### Re 411

#### A VOLUNTARY SHELTERED HOME FOR TREATED LEPROSY PATIENTS - OUR EXPERIENCE

**Karim M.B. & Seah S** Singapore Leprosy Relief Association, Singapore

Singapore Leprosy Relief Association (SILRA) Home was founded to house discharged patients following the introduction of dapsone in Singapore in 1951. In the early days, only simple food and accommodation were needed as the residents felt that they have very little choice. With increasing prosperity, the residents expected better living conditions and recreational activities that include travelling to neighbouring countries for holidays. Fortunately, the passion for leprosy among our supporters and well-wishers remains strong and the wishes of the residents can be fulfilled. We realise that the persons who had leprosy have to be treated like any normal individual.

Recruitment of staff members were simple in the early days. We could find willing workers among the patients and medical personnels who retired from leprosy hospitals. It has become more difficult to recruit workers, as the irrational fear for leprosy among the public is still strife; and we are unable to compete for worker demanding high wages. Fortunately, we are still able to count on a small number of individuals who have the passion for leprosy.

Being a voluntary organization, we depend on supports from the public, both financially and in other forms, to exist. We have always enjoy good supports. The Community Chest, a centralised fund-raising body run by the Ministry of Community Development, takes care of the task of fund-raising and leaves us to concentrate on running the Home.

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### Re 198

#### SUSTAINED INCOME GENERATION AND SOCIAL UPLIFTMENT THROUGH 'SWAYLAMBAN YOJANA'

**Atul Shah & Neela Shah** Comprehensive Leprosy Care Project & Medical Aid Association, Mumbai

Rehabilitation in leprosy is required not only for the visibly disabled but also for those who have become demoralized due to disease and have lost the self-esteem. Reconstructive surgery when followed up by the economic rehabilitation will achieve not only physical correction but also functional benefits. Thus, criteria, priority and the expected outcome need to be clearly defined. Social history can judge the current place held by individuals in family and society. The support required for sustained income generation depends on the age, disability, previous occupation and the ability to carry out income generation activities from the desired aid. Comprehensive Leprosy Care Project & Medical Aid Association has so far supported 650 cases with aids for sustained income generation activities in the state of Gujarat and Goa through their Swaylamban Yojana (self-employment scheme) with a view to social upliftment. A simplified approach involving the leprosy staff for identification of the needy cases, noting the social history and need of the article is followed by the eco-rehab program at which the rehabilitation aids are distributed. The program is conducted with involvement of local and state leaders along with health care staff. The follow-up is carried out at regular intervals by the government leprosy staff and the project personnel. The results over a period of more than 5 years demonstrate that majority of the cases that received aids had substantial income generation leading to better family life. Moreover, the case history of many cases demonstrate that there were far reaching benefits in terms of social acceptance of the rehabilitated cases. It also acts as motivation for other government programs to include the leprosy cases in their plan for social welfare. Presentation will detail the approach, merits and results.

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### Re 213

#### DESTIGMATIZATION AND REHABILITATION OF LEPROSY PATIENTS : A VIABLE METHOD?

**Aparajita Sohoni**, Stanford University, California

A qualitative case-study analysis of twenty individuals residing in a 300,000 person slum revealed a successful model employed by an NGO for leprosy rehabilitation. The gradual replacing of the term leprosy with skin disease ensured higher compliance in, and lower stigma experienced by, leprosy affected persons. This

paper analyzes the approach employed by the NGO and raises questions pertaining to the efficacy of the model and its implications for policy makers and care-givers concerned with leprosy elimination.

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## Re 220

### GOLDEN EGG SYSTEM OF COMMUNITY REHABILITATION OF LEPROSY OR BPL PERSONS

*Dr.T.A.Tattitali*, Surat, Gujarat

Twenty years of service in leprosy - I understand their difficulties and human misery. So I thought - rehabilitation of patients is needed at communities, villages and towns along with

M.D.T., as most of the patients are below the poverty line.

CBR gives an opportunity to patients and children to live in society, socially and mentally well. It gives satisfaction and opportunities for progress.

Colonisation, gives an idea of isolation and antisocial activities and brings a lot of stigma to patients and children - even though they are healthy and educated and having capacity to work.

In modern days, with M.D.T., rehabilitation brings a new approach to patients and society and sometimes, the community needs a lot of manpower.

So here, I have made two types of rehabilitation methods.

1. Job oriented - in villages where leprosy patients are integrated with the unemployed and

B.P.L. persons.

2. Business oriented - where leprosy patients are kept under paramedic care.

So here, under guidance and care, all have to work to get better income. If the care group takes interest really, they get the Golden Egg, otherwise, only the Egg, as the business is a profitable one but needs a small amount of care and guidance.

In village job type method adopted by JH & JAJHS Bank (like IDBI) or state government help taken. In this scheme, employees get Survival Pay + Gr LIC + Gr M.C. + PJ, etc. Employer Free Manpower for 4 years. Here leprosy patients are mixed with unemployed or

B.P.L. for community work.

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## Re 245

### COMMENTS ON THE ROLE PLAYED BY CURED LEPROSY PATIENTS FOR THE ROUTINE JOB IN LEPROSY CONTROL

*Jiang Song, He Tingshu, Liu Xing & Ge Jun*, Institute Of Dermatology of Jiangdu County, China

With regard to the cured leprosy patients to be assistants in the leprosy control network under the new social circumstance and new leprosy control situation, this paper shows experience practised in Jiangdu county. The authors firstly describe the prerequisite and existing problems to carry out leprosy control work then expound roles performed by the cured leprosy patients in the leprosy work, namely supplementing and strengthening leprosy control network, serving as a link for community-based rehabilitation, creating convenient conditions for the work of early case- finding, early diagnosis and early treatment, obtaining more valuable and guidant information of leprosy control work.

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## Re 299

### EVALUATION OF A PROGRESSIVE SELF-CARE TRAINING PROGRAMME

*Dr. Hugh Cross & Lesley Newcombe*, Kathmandu, Nepal

This paper describes the effects of an intensive 14 day Self Care Training Programme that is conducted for people affected by leprosy at Lalgadh Leprosy Services Centre in Nepal. The study group comprised of 254 trainees (66 females and 188 males) who completed the training in the first year of the programme. Main files were checked and all people with impairments who would have been eligible for the SCTC but who did not enter the programme, in the same time frame, were selected. From these, 254 files were randomly selected to represent the control group (75 females and 179 males).

Hospital admissions over a 15 month period were reviewed: i.e. from the start of the training programme and for a period of 3 months after the last trainees had completed the course. A comparison was made between the two groups on hospital admission for infected plantar ulceration during that period. It was found that those who had undertaken the programme were less likely to have been subsequently admitted for hospital treatment ( $X^2 = 5.1$   $p = 0.02$ ). An odds ratio of 1:1.8 (95% C.I. = 0.15 to 0.01) was also calculated.

This paper presents an overview of the issues related to impairment, a description of the Self Care Training Programme, an analysis of the results and a discussion of the findings.



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### Re 305

#### ROLE OF THE REHABILITATION TEAM IN PREVENTION OF IMPAIRMENT AND DISABILITY

*Friedbert B.Herm, Hari B.Chhetri & Rita Gurung, Green Pastures Hospital, Pokhara, Nepal*

Green Pastures Hospital in Pokhara, Nepal has been functioning as a tertiary leprosy referral center for over 20 years. During this time a comprehensive rehabilitation team has been employed and trained. Patients visiting the hospital have access to medical and surgical care, physiotherapy, occupational therapy, psycho-social counseling, a prosthetic/orthotic workshop, and social worker. People with peripheral nerve damage due to leprosy are routinely trained in home-based management of their condition taking into account the medical and social aspect of the prevention of impairment and disability (POID).

Since 5 years, a rehabilitation team has been established in the hospital and for the past three years, the rehabilitation team and the facilities of the hospital have been made available to a wider target group, including people affected by neuro-disability due to other causes than leprosy. The rehabilitation team acts as an interdisciplinary and multi-professional group of specialists assessing the rehabilitation potential and setting goals and plans for the individual rehabilitation process of every referred patient. The team meets in a formal setting called the rehabilitation team meeting.

In the first 5 years of operation of the rehabilitation team meeting, 65 patients were assessed by the rehabilitation team regarding their rehabilitation potential in an interdisciplinary approach using a standardized assessment form. In regular interdisciplinary meetings, the rehabilitation goals and plans for all 65 patients were discussed and set, using the same standardized form. An evaluation of the 65 forms showed specific goals and plans for interventions in 90% of the cases suggesting 277 single interventions. On average, 4 interventions per person for the rehabilitation or prevention of impairment and disability were decided, including reconstructive surgery, physiotherapy, occupational therapy, orthoses and socio-economic rehabilitation.

We conclude that the rehabilitation team functions as an interdisciplinary platform in the decision making process for interventions in rehabilitation and prevention of impairment and disability. The setting of specific goals and time frames by an interdisciplinary team of specialists appears to save time and manpower and makes the intervention period in the hospital there-

fore more time and cost-effective.

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### Re 344

#### THE ROLE OF CBR FOR PERSONS AFFECTED BY LEPROSY

*Prof.Nguyen Xuan Nghien & Ineke Petter, Bach Mai Hospital, Hanoi, Vietnam*

Almost all countries in the world reached the goal of eliminating leprosy disease as a public health problem. The elimination, defined by the World Health Organization, is as less than one leprosy case on treatment per 10,000 population. The reason for the diminishing leprosy burden on the public health services is a combination of effective Multi Drug Treatment (MDT), shortening of drug regimens and active leprosy control programs. Yet, not all problems connected with the disease are solved. The case detection rate stays the same, as well as the percentage of people released from MDT having permanent disabilities. These permanent disabilities are the reason leprosy is feared for, and patients are stigmatized.

Leprosy disabilities are to a certain extent preventable. However, activities introduced by the leprosy control programs are not as effective as they should be, still 30% of the leprosy patients develop permanent disabilities. Having permanent disabilities implies a life-long task to prevent these disabilities from worsening. For this the assistance of a rehabilitation program is needed. In perfect program, rehabilitation of the disabled should contain physical socio-economic and psychological elements, all needed to reach the final goal of full participation in the community. Unfortunately, in most cases rehabilitation activities for leprosy disabled are not yet comprehensive or continuous.

In this presentation we will analyze the rehabilitation activities for the leprosy disabled. A description of leprosy and the connected disabilities is given, followed by rehabilitation procedures and concepts with an emphasis on the role of the Community Based Rehabilitation. A model is used to analyze step by step the problems in rehabilitation activities. Steps used in the model are the size of the problem in the community, the awareness among patients and public, motivation to consult health services, awareness among health staff, the examination procedures, the reliability of diagnosis, the proper start of treatment, the efficacy of the treatment and adherence to treatment. All steps are discussed and possibilities for improvement are suggested, using the field experiences with rehabilitation services for leprosy disabled in Vietnam.

Leprosy control programs in general prioritize MDT for all, second priority is POD and finally rehabilitation. In order to improve the programs for rehabilitation, increase of patients responsibility for their own health and the introduction of so-called care packages are important steps to take.

The final conclusion of the analysis is that rehabilitation of leprosy disabled should be part of a general rehabilitation program.

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### Re 349

#### SELF CARE GROUPS : THE ALERT EXPERIENCE, ETHIOPIA

*Catherine Benbow*, ALERT, Addis Ababa, Ethiopia

The first self care groups were started in the ALERT, Ethiopia leprosy control programme in 1995. They were started in response to two main problems: the increasing number of people who were dependent on the programme for their wound healing despite years of health education and the limited resources for traditional medical wound healing methodologies.

Group membership is voluntary and the outcomes are encouraging. The group members have taken up their responsibility to manage and monitor their own wound status and supply their own wound healing materials. If they wish, they may purchase canvas shoes and PVC boots at a subsidised cost from ALERT. The results show a reduction in the number of foot ulcers; most improvement occurs in the first six months of joining a group, but that improvement is maintained in the longer term. Hand ulcers seem to come and go more quickly and relate to working and seasonal variations. In addition, they pay more attention to their personal hygiene and appearance and some are now concerned about local environmental hygiene. Qualitative outcomes include: increased confidence to participate in society, restored dignity and self respect and a sense of belonging to the community. In December 1999 the number of groups had expanded to a total of seventy two.

The leprosy worker has had to change his / her role from that of a service provider to that of a self care group facilitator; but not all were successful in making this transition.

The remaining challenge is the sustainability and further development of the programme. A number of options are available to achieve this goal, namely: the National Tuberculosis and Leprosy Control Programme, community development organisations and the Leprosy Association.

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### Re 412

#### REHABILITATION OF DISABLED PERSONS

*Dr. Johan P. Velema*, The Leprosy Mission International, The Netherlands

Rehabilitation of disabled persons can take many different forms according to the socio-cultural and political context in which it is undertaken. Some approaches have emphasised the restoration of the physical function of the client, while others have looked beyond to psychological and social well-being. Some have built on the expertise of professionals while others have emphasised the caring capacity available in the family and the community and sought to reinforce it. Besides providing a wide range of possible services to disabled persons, rehabilitation wants to change the attitudes which prevail in society as a whole and promote the integration of disabled people into society with equal rights and opportunities. Four dimensions are described which can be used to characterise and define rehabilitation projects based on the objectives which are defined for them. Thus, types or families of rehabilitation projects can be distinguished. Evaluation of rehabilitation projects should pose questions relevant to the type of project under consideration and should thus begin with a classification of the project as indicated above. Secondly, evaluation should consider the position of people with disabilities in a particular society and how the project contributes to meeting their needs. Questions concerning progress and performance should at least address :

1) Participation 2) Involvement of clients relatives and the community 3) Types of services offered and their utilisation/coverage 4) Outcome.

Questions and indicators will be presented which can be used in the evaluation of each of these components of rehabilitation projects.

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### So 24

#### SOCIAL WELFARE ACTIVITIES OF LEPROSY PATIENTS FOR LAST 23 YEARS AT KUSHT SEVA SADAN, AGRA

*Dr. V.P. Bharadwaj*, K.K. Paliwal, Amar Deo Singh, Dr.(Mrs.) Madhu Bharadwaj, Raja Ram & Subhash Jain, Agra

Kusht Seva Sadan (KSS) in the vicinity of Taj Mahal is



one of the oldest Leprasoriums in India (founded in 1861). Leprosy Patients Welfare Society (LPWS), a N.G.O., is functioning for the welfare of Leprosy patients for the last 23 years. More than 60 (sixty) thousand leprosy patients have been benefited through L.P.W.S. during 23 years at K.S.S. where they got free boarding, lodging, during their short or long term treatment.

During this period, Health Education Activities have been undertaken by L.P.W.S. with an aim to create Awareness about early signs and other aspects of leprosy by organising several meetings and functions. The L.P.W.S. has widely spread the message to the people from all walks of life that leprosy is a curable disease using MDT and if detected and treated at early stage, deformities and disabilities are prevented. Such efforts of the L.P.W.S. have resulted in favourably changing the attitudes, practices and behaviour of the people towards leprosy.

The L.P.W.S. has also helped patients having reactions, bad ulcers and complications. Those who needed reconstructive surgery, arrangements were made at established leprosy hospitals in the country where facilities for reconstructive surgery are available. L.P.W.S. also helped cured leprosy patients for getting respectable, social and economic rehabilitation. The detailed activities undertaken and future perspectives will be presented and discussed.

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### So 118

#### COMMUNITY HEALTH WORKERS IN LEPROSY ELIMINATION CAMPAIGN

**Dr. Anne Mattam**, Damien Foundation India Trust, Chennai

Recent strategy of Leprosy Elimination Campaign (LEG) has been employed widely in leprosy control programmes. Various categories of personnel are being utilised for this activity. We present our experience in Bihar in utilising the services of Community Health Workers. A total of 80 Community Health Workers belonging to a NGO in Nalanda district, Bihar, India were given orientation training on screening of population for signs of leprosy. This NGO covered a population of 55,000 in 54 villages. Propaganda was carried out for one day followed by a search programme (survey) for one day. These workers detected 50 new cases of leprosy and 50% of them were Multi Bacillary cases. The cost of detection per patient was Rupees 280 only. If a larger area is covered, the cost would be less. This clearly indicates that different categories of health workers could be successfully utilised for LEC.

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### So 120

#### ROLE OF TRAINED HEALTH WORKERS AND COMUNITY PARTICIPATION IN LEPROSY ELIMINATION CAMPAIGN

**Ashima Mitra**, CASP - Plan Project, New Delhi

Leprosy is generally considered not just as a disease but a curse. This disease has been shrouded in myths and mysteries causing leprosy cases to untold sufferings, physical, mental as well as social. Recent developments about the disease and the introduction of modern treatment through MDT have caused a definite shift in the attitude towards leprosy cases. The magnitude of the disease is tremendous in some countries of Asia, Africa and Latin America. About 5,60,000 new cases are detected annually worldwide and over 70% of them arise from India alone. Today, leprosy is no longer treated as a dreaded disease. It is definitely curable and no leprosy-affected person has to face the problem of any deformity if diagnosed and treated in time. Therefore, the key to success of any leprosy elimination programme is the early detection of the hidden disease. Since the disease is attached to social stigma, the success lies in community participation in creating better awareness leading to voluntary reporting of the disease. In spite of having such a heavy load of leprosy in India, there is a dearth of proper trained health workers. Health workers both at the community level as well as those associated with existing health infrastructure need appropriate orientation and training towards the disease elimination. It has also been observed that most of the leprosy patients come from under-privileged community.

GASP-PLAN, a NGO has made a strategic survey in the slums of Govindpuri, Sangam Vihar and Badarpur in South Delhi. It is promoting a three pronged strategy, i.e. LEG, SAPEL and availability of MDT towards elimination of the disease in the area. Leprosy is to be eliminated as a public health problem through active participation of the community and the trained motivated health providers.

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### So 123

#### SOCIAL INTERVENTION MAKING A POSITIVE IMPACT IN A LIFE DISTURBANCE SITUATION OF A WOMAN WITH LEPROSY

**N.B. Motekar**, V.K. Joseph & Sujata Marihal Belgaum Medical Hospital, Hindalga

Leprosy perhaps is the only disease, which under the present law provides the grounds for spouses to insist

on separation (Muslim Marriage Act 1939, Special Marriage Act 1955). The gender bias is reflected in the fact that men diagnosed with leprosy in India suffer fewer negative reactions as compared to women came as a welcome surprise when they do happen. Involvement of health professionals at all levels through interventions like counselling at individuals/ family levels coupled with health education and where required providing legal assistance can turn the situation in favour of the woman. A case report where team efforts resulted in making a positive difference in the life disturbance situation of a woman is reported. In the paper we describe our efforts which resulted in making a positive difference in the life of one such woman.

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## So 146

### LEPROSY IN THE NEW MILLENNIUM IN PERSPECTIVE OF EDUCATED YOUTH

**A.B.Prabhavalkar & Dr.V.V.Dongre** Alibag, Maharashtra

Second half of the 20th century changed the entire face of leprosy problems prevailing in our country for centuries. Advances in the chemotherapy augmented rapid decline in prevalence rate of leprosy. Prospective elimination of leprosy, in the very beginning of new millennium, has ensconced leprosy on the verge of integration into General Health System (GHS). The success of such operational transmutation of leprosy will mainly depend on attitude of society, and youth in particular.

This paper presents the study, undertaken to understand the state of readiness of educated youth to accept leprosy as a common health problem. The study, by means of interviews, was conducted among 1185 youths, from three places in Maharashtra, a progressive state of India, with varying leprosy endemicity, namely Mumbai, Raigad and Wardha.

Level of knowledge among this group is satisfactory. However, knowledge pertaining to infectivity and transmission is poor. 75% of respondents felt that the problem of leprosy is on the rise. While 69% opposed the isolation of leprosy patients, 60% refused to have conjugal relationship with a leprosy spouse. Similarly 57% advocated separate hospital for leprosy.

In the context of leprosy services and expertise, only 11% of respondents believe that doctor at GHS can diagnose leprosy correctly. Moreover, 69% are not aware that treatment on leprosy is available at GHS. Similarly, as low as 12% youth prefer to take leprosy

treatment from GHS. 59% would even prefer leprosy hospitals for this purpose.

Much depends on new generation for success of integrated programme. Unfortunately their attitude seems to thwart the prospects of the programme. It can be inferred that low prevalence of leprosy in recent years that has made leprosy uncommon problem for youth only to increase heedlessness among them. Negative attitude of youth towards leprosy calls for immediate corrective measures to rejuvenate health education activities to disseminate scientific knowledge about leprosy & bring about positive change among this group to accept leprosy as a common health problem. The authors caution that if corrective steps are not taken up, the new millennium will face macabre state of social problems related to leprosy.

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## So 185

### ROLE OF NGOS IN OVERCOMING THE STIGMA RELATED TO LEPROSY

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Leprosy is the oldest disease known to mankind. It is different from others disease that it affects the person totally, i.e. his health, look, self-esteem, job, family, his position in the society, etc. It is a major public health problem in India carrying 58% of global patient load with a prevalence rate of 5.9/ 10000 (WHO Sept. 99). But it is encouraging that the disease has shown a declining trend first time in 1987 and the World Health Assembly has taken a resolution to eliminate it. So the concerted effort of all concerned can help in overcoming the hurdles in controlling leprosy.

The stigma related to leprosy is the main obstacle to its efficient elimination. The fear of rejection by the family & society may cause more stress than the disease itself and may lead to hidden cases.

NGOs have been playing a significant role in the field of leprosy and in India there is co-operation and collaboration with Government but still there is a long way to go.

It has been felt that the stigma related to leprosy is due to the deformities it causes and this can be overcome by educating the people through effective IEC and by providing them the necessary informations, i.e. the disease, its transmission, treatment and rehabilitation facilities available and removing myths and misconceptions. We felt questions and answers from the community should be encouraged in effective designing of the messages to be communicated. Working with the community, we realized that no programme can succeed without community participation. Health



facilities can help but it is the community that has to take the initiative in eliminating the disease. NGOs should try to create a leprosy friendly environment where affected people can come forward and seek voluntary help.

CASP-PLAN Delhi, an NGO, made a survey in Urban Slums, Sangam Vihar, Badarpur and Govindpuri and trained community health guides, Social workers and doctors on communication and early case detection of leprosy and has plans to carry forward the activities further.

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### So 221

#### EFFECTIVE SPONSORSHIP FOR SOCIAL ACCEPTANCE OF CHILDREN IN THE SHADOW OF LEPROSY

*Mrs.Sushama Joshi*, Programme Officer, FELI

Leprosy has been considered primarily as a medical problem. Therefore, all Government efforts are rightly focussed on the early detection and treatment. However, experience has taught us leprosy is more of a social problem resulting in stigmatization, isolation and loss of dignity. This affects not only the patients but also their families. Therefore, while strengthening the medical programmes it is essential that attention should be focussed on issues like creating awareness, provision of counselling to the person affected as well as the family and orientation for preventing disability and debilitation.

The recent campaign conducted by Government of India has revealed that 18% of the newly affected cases are children below the age of 16; therefore if these children are not protected from stigma and isolation, the future of these children will be in jeopardy.

Number of social work procedures are in vogue in dealing with socio-medical issues like children in the shadow of H.I.V aids, cancer, leprosy, etc. Among these methods, sponsorship has been found to be a very effective method of dealing with such issues like leprosy. This paper tries to analyse the situation and indicates how sponsorship can be an effective tool in preventing debilitation/isolation and provides for utilizing techniques like case work counselling and appropriate communication.

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### So 345

#### THE MISTREATMENT UNDER THE JAPANESE GOVERNMENT'S COMPULSORY HANSEN'S DISEASE ISOLATION POLICY

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The compulsory isolation policy of Japan was established in 1907, when Leprosy Prevention Law was enacted. Most of patients were compelled to be isolated to the sanatoriums (leprosariums), and to spend the life there by this law. Though its scientific grounds were scarce and it disregarded human rights, this law has been kept even after the development of dapsone for prejudices of society and medical authorities. Finally the law was repealed in 1996, in the result of a tenacious movement by the sanatorium residents (they were already cured, so they are now to be called not patients but sanatorium residents). However, they were forced a difficult situation over physical, mental, social and economical aspects, that is, the whole life, and such a difficult situation still has little been clarified by now. So in this study we try to clarify the situation in which the sanatorium residents in Japan have been put by the government's isolation policy. A detailed investigation by the visit interview method was done from 1997 to 1999 for all residents (1394 people) of the three national sanatoriums and the answer was obtained from 818 people (64%).

Fifty four percent of the sanatorium residents recognize that they were hospitalized compulsorily. 36% people of male had vasectomies. All men had to have vasectomies before they got married at one sanatorium. Twelve percent people of female had abortions. Almost all cases are regarded as compulsory on substance. There was no case of birth in sanatoriums, so it is thought that persistent eugenics policy for people with Hansen's disease have been done. Almost all members of sanatorium residents have experienced patients work. Patients work was not for rehabilitation but for maintenance of sanatoriums; it was applied compulsory and the tendency was seen that the more work people did, the more trouble was caused in their hands.

It is thought that a lot of human rights have been violated under the isolation policy in Japan. It is necessary that such history will be the significant lesson of the ideal way of the medical treatment including infectious disease policy in the future.

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### So 377

#### THE TEXTURE OF OUR SOULS : TRANSFORMING THE SOCIAL IMAGE OF LEPROSY

*Anwei Skinsnes Law*, USA

More than 100 books and thousands of poems have been written by people who have personally faced the challenges of leprosy. Songs have been written and music has been composed. These books, poems and songs reflect deep emotional pain but, at the same time, present inspiring images of dignity and strength. As such, they are a tremendous, largely untapped, resource, and represent a powerful tool with which to change the social image of leprosy while, at the same time, providing an important commentary on the long-lasting consequences of prejudice, discrimination and injustice.

I have sometimes clasped in my arms the trees of the forest, praying God to animate them and give me a friend. Guascoz, France, 1803

My heart and head were full of the mystery of human existence. Especially in thinking of the friends gone before an inexpressible sadness came over me....  
Shrill, shrill, the crickets chirp and

call, and from my heart the slow tears fall. Honami Nagata, poet and author, Japan

A man can survive a cataclysm; suffer the loss of his nearest and dearest; see the whole pattern of his life smashed to pieces, and yet remain basically unchanged; the inner texture of his soul untouched. Peter Greave, author of four books, England

There is a communion in everything related to nature, beginning with the waking of the birds in the melodious and harmonious song in the almond trees, spreading happiness in our spirit at times of such great need. Antonio Borges, Jr., author, Brazil

I stopped to watch the baby chickens feed a while, And as they scratched in search of worms,

My gloom was gone,

And I

Found I could smile! Hayashi, Japan

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### So 378

#### **FREEING OURSELVES OF PREJUDICE : LANGUAGE FORMS OPINIONS**

Anwei Skinsnes Law, USA

Language forms opinions

The strong negative associations with the term leprosy and thoughtless use of the derogatory word leper have resulted in many people advocating that the name of the disease be changed to Hansen's Disease. However, the issue of terminology goes far beyond a preference for the term Hansen's Disease or leprosy and their

equivalents in different languages. The images, language and labels used in association with leprosy or Hansen's Disease have the power to either destroy a person's life or reaffirm their humanity.

Every culture has language that is hurtful and language that promotes dignity. To promote self-confidence in those individuals personally faced with the challenges of leprosy and to change the traditional social image of the disease, it is imperative to replace hurtful language with language that recognizes a person as an individual separate from the disease and focuses on ability rather than disability.

When I look back at my past, my soul is beckoned to the poems I wrote of my father. There are times when I think it would be more natural for me to write about my life as a leprosy sufferer, but my attitude of mind as a poet is inclined more to write about my existence as a human being. Haruko Tsuda, Japan

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### So 49

#### **LOCAL PARTICIPATION IN URBAN LEPROSY ERADICATION PROGRAMME**

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Community Participation is one of the most popular terms of the era specially when speaking about people oriented programmes. The success of any programme is attributed to community participation. Community participation in leprosy eradication programme is still restricted to community leaders or few volunteers.

Involving organized groups in the community for leprosy control activities is a novel idea adopted in Salem urban, Tamilnadu, India. The organization covers a population of 5,50,000. The area is divided into 11 sectors and has 33 drug delivery points. Registered and unregistered organizations in the project area (community) are roped in, motivated, trained and employed for case detection, completion of treatment and preventive education. During the year 1999-2000, a total of 825 leprosy new patients are registered for treatment. Treatment compliance is more than 95%.

The experience of St. Mary's, Salem in collaborating with the service oriented groups and strategies employed in enlisting their co-operation will be discussed in detail.

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### So 84

#### **TRIALOGUE - A STRATEGY FOR COMMUNITY/FAMILY BASED REHABILITATION**

*J.Kalchuri, P.K.Ram, B.L.Sharma & D. W. Deshbhratar Bhopal*

For Community Based Rehabilitation (CBR), it is essential that community & family is educated about the scientific facts of leprosy and convinced about curability. Uprooting perceived fear of infectivity, myths & misconception is a precondition for raising leprosy affected persons. Counseling through trialogue has been tried for the same purpose. 8 issues of ostracisation and 4 issues of social restriction were resolved successfully, through TRIALOGUE.

The issues were resolved in POD care & concern camps. Many sittings and follow up was required to reach the goal. Individual case was of its own kind, requiring same strategy & approach i.e. TRIALOGUE.

Cases which were resolved belong to rural area of different districts. This effort not only resolved the problem of ostracisation but also prevented future ostracisation & restrictions on social services to Leprosy Affected Persons (LAP) was also put to an end.

TRIALOGUE is a strategy which aims to changing community attitudes and behaviour through role models, active participation in caring for leprosy disabled as well as open and honest discussion about fears concerns, prejudices and problems. This is an interactive method between the key playerspatients, providers and people around - all of whom are on an equal footing.

In POD CARE & CONCERN CAMPS many myths & misconceptions about leprosy get resolved automatically because of services and action oriented activities. During camp all three stake holders

i.e. patients, providers of services and people around (PPP), are actively associated to surface the social issues and discuss then openly. KAP changes through TRIALOGUE have been sustainable. Decisions arrived at in this TRIALOGUE situation is a consensus decision leading to resolution of the issues.

The strategy is being applied in the entire state gradually and health functionaries have been identified to function as facilitators.

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### So 105

#### **A STUDY OF BEHAVIOURIAL CHANGES IN SCHOOL GOING HEALTHY CHILDREN OF LEPROSY PARENTS**

*Dr.B.B.Mahajan, Dr.Geeta Garg & Dr.R.R.Gupta, Government Medical College & Hospital, Faridkot, Punjab*

Leprosy is being considered a social stigma & God s curse rather than a disease. Not only theleprosy parents but their children are also discriminated in our society in all spheres of life. 77 schoolgoing healthy children having one or both leprosy parents were examined to study the behavioural changes according to child score B, i.e. children behaviour questionnaire prepared by child psychologist. These children of leprosy parents were being admitted in charitable school cum ashrams which was providing boarding & lodging facilities to the children which helps them not only to study in a good environment but also to train them in vocational courses. These school cum ashrams had helped to avoid social stigma attached to these children of being having one or both leprosy parents. All these children were in age group of 5-15 yrs. 58 children were having non Punjabi parents & 19 having Punjabi parents. None of these children was having any signs & symptoms of leprosy nor any child showed any significant behavioural changes as recorded on children s behaviour questionnaire. So these charitable boarding & lodging schools for children of leprosy parents is the need of the hour in our society to help these children to become responsible citizens without any social stigma of their parents disease which requires initiative from the dermatologists with active participation of social organisations.

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### So 151

#### **ASSESSMENT OF IMPACT OF SER ASSISTANCE ON THE SOCIO-ECONOMIC STANDARDS OF LEPROSY AFFECTED**

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Socio economic rehabilitation programme is implemented by LEPRO India in a project covering two tribal districts in Orissa since three years. The approach is holistic, evolutionary and participatory. Appropriate systems are devised for identification of clients, assessment of needs, economic assistance and support through follow up to enable the clients to re-establish normal family and social relationships. The approach involves family and local community in all stages of the programme.

150 clients were provided assistance to take up income generating schemes of their choice; the State Govern-

ment has been a major player in the scheme of assistance.

The impact of SER assistance on the family and socioeconomic situation of the clients has been assessed by administering an interview schedule to 150 beneficiaries.

The results are analyzed and the findings are discussed with special reference to the differences in impact in extent of disabilities, gender issues, rehabilitation and location of the clients.

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### So 153

#### REASONS FOR BEGGING BY LEPROSY COLONY-MATES AND WHY THEY LEFT HOME

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**Objectives :** To find out the reason for begging and causes for resorting to colony life.

**Design :** Cross-sectional study, by using questionnaire.

**Setting :** 4 leprosy colonies in Vizianagaram district of Andhra Pradesh were taken for study.

**Participants :** Leprosy affected persons (RFT) living in these colonies.

**Main out-come Measures :** 118 heads of families were interviewed, in June 1998.

**Results :** For 73% of them, having deformities, begging became the last resort. 15% of the total interviewed, joined colonies due to rejection by families.

**Conclusion :** Deformity and rejection by family lead most of them to begging. All of them are interested in their children's future, and want assistance for their education and vocational training. If alternative source of income is provided, with guarantee, 15% of them are willing to stop begging.

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### So 155

#### FACTORS INFLUENCING REGULARITY OF TREATMENT OF LEPROSY PATIENTS

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In order to understand the contributing factors responsible for treatment compliance or otherwise in leprosy patients, 288 patients attending the OPD of central JALMA Institute for Leprosy, Agra were selected for this study. Of these, 74 patients were drop-outs, 121 patients were irregular and remaining 93 patients were regular in seeking their treatment.

These patients were interrogated in-depth to inquire about their demographic profile, SES status, their knowledge about disease & its associated deformities, treatment and its curative aspect and other related factors such as nature of occupation, distance, timings, other sicknesses, family responsibilities & so on; so that the relevant factors can be identified which act as the barrier in seeking regular treatment. The details of the findings will be discussed at the time of presentation.

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### So 219

#### COMMUNITY PERCEPTIONS AND THEIR INFLUENCE ON DEHABILITATION OF PERSONS AFFECTED BY LEPROSY

**Sujai Suneetha, Ranganadha Rao P.V. & Tilak S. Chauhan,** Lepa India, Hyderabad

Leprosy not only affects the body; it also disrupts patient's socio-economic & cultural balance and leads a patient into a state of Dehabilitation. Dehabilitation is a reduction in the social function of the individual, which is reflected in the overall quality of life, attitudes and actions. Societal factors play an important role in determining or preventing dehabilitation of people affected by leprosy.

This study analyzed the perceptions and practices of the community regarding leprosy and persons affected by leprosy and their influence on dehabilitation of patients. 50 leprosy-affected patients were interviewed based on a questionnaire (55 questions) that covered family relationships, vocational conditions, social interactions & self-esteem of the patients. For each patient, two other members were interviewed (50 questions) from among their family, relatives, work place colleagues or society members. The study was conducted in the HYLEP urban control project of LEPRO India in Hyderabad. Half of the respondents were from a high endemic area and half from a low endemic area.

In the high endemic area, the average dehabilitation score for vocational interactions was highest indicating that the patients were well accepted in their work places. Next in descending order was family relationship; self-esteem and acceptance in society was the lowest score. In the study of dehabilitation of society,



it was found that the family members had the highest score, followed by work colleagues, relatives and other society members. This shows that family members have the highest acceptance of the patients compared to the other three groups. The debilitation score of patients and society from the low endemic area reveal almost identical figures as the high endemic area with only a marginal increase in the average values. Further recommendations based on the study will be discussed.

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### So 306

#### FACTORS INFLUENCING DISCONTINUATION OF TREATMENT AMONG PERSONS AFFECTED BY LEPROSY IN EASTERN NEPAL

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In preventing patients from early discontinuation of treatment, many programmes invest in improving the doctor-patient relationship, improving the patient's knowledge about the disease and its treatment and creating informed-consent. These approaches assume that patients take a rational decision to continue or not with treatment and that problems faced by the patient can be solved. Not only these are important issues, but also the whole context, the patient's life, culture, and perceived structural barriers are important. On basis of this perspective a study was conducted to investigate the main reasons why some patients continued treatment and other did not. The study conducted was qualitative and in-depth interviews were used (n=76). The patients' understanding of their disease and experience with treatment as well as their diverse situations were investigated.

The findings clearly demonstrate that the social context was important in how people looked at the person affected by leprosy. The person's ritual, economical and political status was of influence in how the disease was experienced by the person affected by leprosy and in how the family and community members acted towards this person. Other important factors which influenced the decision to continue or not with treatment were the perceived quality of care of, the leprosy services delivered at the HPs, the side effects experienced, the presence of visible symptoms and deformities, fear of social repercussions and a different notion of cure. To cure the disease leprosy, a patient needs to be able to finish his/her treatment. This study shows that decisions to discontinue treatment must be regarded as a patient's attempt to gain control over his/her life; whereby this gaining of control can be more important to the individual than achieving medical cure. The pre-

sensation will focus on some of the results and especially on the effect of interpersonal relationships and will show how persons affected by leprosy gain control over their lives and thus stopped medication.

### So 317

#### PHYCHO-SOCIAL ASPECTS OF LEPROSY

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In 1991, more than 400 Nepali leprosy patients were interviewed using a WHO self reporting questionnaire designed to detect non-psychotic disorders. The questionnaire was supplemented with questions about the patient's family and social situation. The data showed a low but significant level of mental health problems among leprosy patients (80/411, 22%) and identified significant factors predisposing patients to psychological stress (poor family acceptance) as well factors reducing the risk of mental illness (literacy, admission to hospital). The same questionnaire was used in interviews with leprosy patients in 2000, and the results compared with the earlier cohort.

Since leprosy health care includes care of possible psychological and social problems caused by the stigma associated with leprosy, it is important to measure the extent of these problems. Improved individual and social acceptance of leprosy has been posited to be the result of the newly perceived curability of leprosy and the decline in deformity in the past 10 years since the introduction of multi-drug therapy (MDT). However this improvement has not been documented in any quantitative manner. The comparison of data collected from two cohorts of patients nearly 10 years apart will provide important information on the trends in leprosy patients' mental health and social acceptance..

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### So 393

#### COMMUNITY PARTICIPATION IN LEPROSY ELIMINATION

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Community is a term applied to society and social groups inhabiting a particular area and acting together in the chief concern of their lives. The community consists of groups of people living in harmony and interdependence. Therefore The Community plays a pivotal

role in the scenario of leprosy elimination and rehabilitation of the victims of the disease, leprosy.

In order to ensure their participation, the NGOs and Govt. authorities must bring about an awareness of leprosy at every level and motivate the community to go hand in hand with the efforts of the NGOs and Govt. authorities to tackle the disease and to bring under control the prevalence of the disease and minimize the trauma that follows alongside.

What steps are taken towards community education? Health education and social rehabilitation aspects must be popularized. The community must be awakened to its responsibility that elimination of the disease and rehabilitation of its victims lies solely with them. This in turn will elevate the social status of the leprosy patients in the community.

Support for Community Action for Leprosy Elimination (SCALE) is one such community based project launched to motivate and mobilize community action and utilize the community resources for active support of leprosy elimination.

SCALE aims at harnessing community volunteer groups to assist leprosy work. This project initiates active health education programmes on leprosy to the general public about every aspect of the disease. Skin camps are organised to detect hidden costs and to bring them out for medical care and surgical assistance. This project also promotes active involvement in welfare and rehabilitation activities in order to pave the way for quicker social assimilation. Ideas and suggestions arising from the community participation are periodically exchanged with the NGOs and Govt. authorities through seminars which help update their plan of action.

In short, the involvement of the community is of such integral importance that from the stages of detection of the cases, treatment and care to rehabilitation the community's active participation plays an important function which no other body can assume.

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## So 14

### NON-CONVENTIONAL METHODS OF HEALTH EDUCATION

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The non-conventional methods of health education bring novelty both to the leprosy workers and the audience which has been experienced at the Balarampur Control Unit of the Gandhi Memorial Leprosy Foundation in West Bengal. The methods were puppet-show, street play and Kustha-Samkirtan. The stories

were based on the incidents which took place locally, played by the leprosy workers in local dialects. There is scope to change the stories, characters, dialogue while the central theme, the message on leprosy remains the same.

Introduction of non-conventional methods of health education along with routine activities has encouraged early case reporting, treatment compliance and involvement of the social leadership in anti-leprosy activities.

An analysis of data collected for last 8 years (1992 - 1999) produces encouraging outcome. Total 386 programmes were conducted in 287 villages with an average audience of 450. The effects include on spot reporting 241 persons with suspicious lesions. Total 322 patients were reported and registered including cases referred by teachers, community leaders and family members. It also prepared grounds to solve unfavourable issues.

The above findings suggest that non-conventional methods have potential contribution to create mass-awareness in leprosy and to change behavioural pattern as well, especially in the rural area.

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## So 20

### EFFECTIVENESS OF IEC INTERVENTION IN SPECIAL LEPROSY CAMPAIGN IN AN URBAN AREA OF ORISSA

*K.A.Benny, P.V.Ranganadha Rao, V.Prabhakara Rao & Jaydev Sahu* Hyderabad

Modified leprosy campaigns were conducted in Orissa with the components of active search and confirmation involving General Health Care staff. One such modified leprosy elimination campaign (MLEC) was conducted with the strategy of Voluntary Report Centre approach in Orissa State three months after a similar exercise.

LEPRA India established an IEC and POD unit in Bhubaneswar urban area to strengthen the services in Bhubaneswar leprosy eradication unit in the areas of Health Education and POD. Voluntary reporting centre approach was implemented under the guidelines of Government of India with necessary pre-requisite IEC activities in July, 2000. IEC activities included methods of personal communication and information campaign using mass media. The content of the message concentrated on improving voluntary reporting of cases to existing health facility treating leprosy. All people who have attended the voluntary reporting cases were interviewed to know the source of information to assess the effectiveness of IEC campaign.



151 people reported at voluntary reporting centres with suspected signs of leprosy. 82 patients were confirmed with active signs of leprosy. It was observed in the analysis that 8 people reached voluntary reporting centres merely by seeing the directive signboards and banners. Effectiveness of these intervention methods of IEC activities used and their reach in urban and semi urban areas of Bhubaneswar city were discussed in this presentation.

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### So 144

#### PERCEPTION AND HEALTH BEHAVIOUR OF LEPROSY AFFECTED MIGRANT PEOPLE - AN OPERATIONAL RESEARCH

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An urban leprosy project was established in 1989 in Hyderabad city of Andhra Pradesh with SET strategy under NLEP guidelines. The project covers a population of 1,98,487 in the peripheral wards of Hyderabad city. The study area has 10% migrants among the general population. The migrant population is distributed in small groups. Many people from neighbouring villages migrated in groups with family members seeking their livelihood. These people along with their families settled in clusters of huts in the border of project area. The health behaviour among these migrant groups is different from resident urban population. Study was conducted to understand the perception and social reaction among urban and migrant population towards leprosy. Data was collected through in depth interviews through qualitative interview techniques. The findings are used to formulate innovative strategies to cover these population. The study findings and strategy for programme coverage are discussed.

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#### KAP AMONG GENERAL PUBLIC AND SERVICE PROVIDERS AND PROSPECTS OF LEPROSY INTEGRATION

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The Y2K has not witnessed, immensely promulgated leprosy elimination. The world will enter the new millennium, in a month's time, encumbered with reasonably high prevalence of leprosy and static rate of New Case Detection (NCD) in various parts of endemic regions. Yet, pronouncement of Integration of Leprosy into General Health System (GHS) appears decisive. Positive attitude of society & beneficiaries and preparedness of service providers are pre-eminent determinants to success of Leprosy Eradication Programme through GHS. In this contest, KAP Studies were undertaken among general public and GHS service providers (GHS-SP) to gauge the prospects of Leprosy Integration Programme in Raigad District of Maharashtra State.

The study observed satisfactory level of leprosy knowledge among 996 lay respondents and 488 GHS-SP. The least confidence in GHS in regard with leprosy expertise is shown by general public (4%). Only 12% prefer to take treatment from GHS. This can be attributed to the inferior quality of services people experience at GHS. As many as 77% are against conjugal relationship with leprosy spouse and 73% advocating isolation of leprosy patients in this hi-tech cyber-age.

While 75% of GHS-SP respondents showed no reservation for Leprosy Integration Programme, 67% opined that such operational transmutation will help eliminate social stigma attached to leprosy. However, they seem equally divided over their view about the need to continue NELP to hasten the process of Leprosy Eradication. Although 73% of GHS-SP respondents were found to acquire correct knowledge of suspecting leprosy, 53% do not know right diagnostic signs. Similarly, knowledge in view of leprosy complication is observed far below satisfactory level.

The paper also examines the impact of level of KAP among general public and GHS-SP on pattern of New Case Detection (NCD). The dependency on active survey to detect over half of the new cases is increased by 30%, in post MDT period. GHS contribution in NCD has leapt to double (from 8% to 16% of total NCD) against a steep fall in voluntary reporting by 44%.

Continued on next page The authors review the areas needing immediate attention and discuss the prospects of Leprosy Integration Programme. However, the authors believe that the time is not yet congruous for integrating leprosy into GHS, at least in the regions with alarmingly high PR & NCDR and technically unprepared GHS-SP in terms of leprosy expertise. It is inevitable at this juncture that, to achieve desired results of integrated programme, priority should be given to eliminating dependency on leprosy institutes and to restoring faith in GHS for leprosy.

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### HEALTH EDUCATION FOR LEPROSY IN RURAL AREA

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I am M.D. Shaikh, Leprosy Assistant working in NLEP in Gujarat State. I want to explain some experiences about Health Education in Leprosy. Health Education plays an important role in the control of leprosy. It should be directed towards the general public, especially receptive sections such as students, school children, school teachers, also medical students and physicians, paramedical workers and the leprosy patient and his family.

Most of the public live in villages. They have not enough education about leprosy. Those people have blind beliefs about leprosy disease. As per my field experiences, people believe that leprosy means Man who has lost his hand, feet and fingers, depressed nose, lion face or a claw hand. People do not know early signs and symptoms of leprosy - even educated people are ignorant about leprosy. Due to social stigma, people are not taking interest to work in this field.

Health education is the most important to detect early leprosy cases. In rural areas people have some blind beliefs such as:

1) Leprosy is an incurable disease; 2) Leprosy is a hereditary disease.

First of all, we should remove these beliefs by health education - flip book in local languages, charts and posters are very useful for wide spread health education about leprosy. During house to house survey, flip book is very useful, like AN ATLAS OF LEPROSY patches on different parts of body where loss of hair, different colour from original skin colours, nodular thickening of earlobes, loss of eyebrow -this kind of photo pictures are very effective with rural people. By seeing this book, hidden cases themselves come out for treatment.

Those people who have no knowledge about leprosy because they live in tribal intenal areas, sometimes they cannot take early treatment and become victims of deformities.

Now-a-days our government has started M.L.E.C. and in this programme, we are giving broad health education in rural areas. We have finished two M.L.E.C. programmes in Gujarat State by general health staff.

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### MAKING HEALTH EDUCATION EFFORTS RELEVANT : THE KARIGIRI APPROACH TO COMMUNITY TRAINING

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With integration of leprosy services with general health care, there was a need for senior field personnel from the original leprosy programme to be retrained in key areas of general health, so as to make them equivalent to their counter-parts in the public health sector. This paper presents our experiences and efficacy in undertaking a training course in Health Education for Senior Non-Medical Supervisors in the Government of Tamil Nadu.

A total of 35 participants were trained in two batches, each for 2 months duration from April 1999 to July 1999 at SLR &:TC, Karigiri. It was decided to use the strategy of employing only active learning methods so that they would be involved in Learning by Doing. The curriculum was designed partly as community-oriented and partly community-based. Modern methodologies tailor-made to suit the needs of the groups were used. Dynamic innovations based on the current situation in specific groups are incorporated. Finally, the programme drew from the experiences of individual members, utilizing peer to peer teaching and learning strategies to the fullest. After carefully considering individual differences of the participants, they were divided into 4 groups. Two nearby villages were geographically divided into four areas for implementation of Health Education activity. Participants were motivated to establish good rapport with the community, and were required to conduct an initial survey, to establish lacunae in the health situation as well as establish the level of knowledge among the villagers by a pre-test. Four key areas were identified by the participants such as Maternal and Child Health, Polio, Environmental Pollution, etc. The topic was then utilized both to learn about, share their newly-learned knowledge with the other three groups as a trial teaching process, impart this information to the community, and finally monitor the effectiveness of their health education effort by a post-test among the villagers.

The level of knowledge of the villagers for all groups taken together was 27% in the pre-test and 72% in the post-test. Improvement in specific topics was a minimum of 32% and maximum of 71%.

Further details and experiences will be discussed and presented in the paper.

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**So 215****IMPACT OF IEC IN URBAN LEPROSY CONTROL IN CHENNAI**

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I.E.C. continues to be the strongest instrument in case detection at Gremaltes Hospital in Chennai. Gremaltes caters to a population of twenty four lakhs for the period of three decades. Out of the 56,932 detected cases so far, 32.13% is by voluntary reporting.

This has been achieved by intensive systematic I.E.C. covering the project area of seventy nine corporation divisions. Mass group and individual approach were used by trained health educators and other health workers.

Comparison of various modes of surveys in case detection versus voluntary reporting is discussed in detail in this presentation.

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**So 266****METHOD AND EFFECT OF HEALTH EDUCATION ON LEPROSY IN THE NATIONAL AREA OF SICHUAN PROVINCE IN CHINA**

*Wang Rong Mong, Hu Lufang, Wu Xingshen, Ling Yong & He Lu*, Sichuan Institute Of Dermatology & Venereology, Sichuan, China

Health education on leprosy are carried out in the Liangshan national area of Sichuan Province, the knowledge of leprosy are popularized, good effect is got in discovering more patients and increasing the knowledge leprosy grasped by the civil servants.

Method: The government attend the workshop to training the directors of the town and the sanitation house as well as epidemic doctors. News media and public health organization carry out health education on leprosy by all kinds of methods. Special organizations collect the clues reported by the barefoot doctors and the mass, assign experts to detenninate the diagnosis. Health education covers 17 counties, 601 townships, more than 3709 villages. 59 short training classes are held, 4707 cadres of counties, townships and villages and health workers attend the training, 225 clues are reported right now, and 47 are determinated as leprosy patients by bacterial and histological examination. 134 cases are discovered in the preecture that year which is 47 cases more than the year before (54% more). The knowledge of leprosy grasped by health workers and the mass is increased. It demonstrates that it is necessary for the government to attend

the health education on leprosy in the national area, which can discover the hidden patients in the community, and teach a good lesson on leprosy to the whole society, push forward the work of elimination of leprosy.

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**So 298****AWARENESS ABOUT LEPROSY IN SUNSARI DISTRICT OF NEPAL**

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Nepal is one of the countries with high prevalence of leprosy and in general the prevalence of the disease is relatively higher in the Terai compared to the Hills. In line with the objective set by WHO for elimination of leprosy, a Nationwide Leprosy Elimination Campaign (NLEC) was undertaken during August 1998 to February 1999 under the co-ordination of the Leprosy Control Division, Department of Health Services, HMG, Nepal. One of the objectives of this campaign was to increase community awareness. In the present study, we analyzed the knowledge of leprosy, leprosy elimination program and the impact of the media on such awareness in the population of Sunsari District, Nepal on national immunization day program (21st November 1999). A total of 1647 respondents were interviewed. Out of which 60% were female and 74% were in the age group of 20-40 years. Agricultural workers constituted 58%. 31.6% were illiterates. Approximately 60% of the respondents knew the cause and symptoms of leprosy. Leprosy is curable was felt by 81.8% and 95% thought that in suspicion of disease it is necessary to go to hospital for treatment. Although, 75% of the respondents knew that drugs for leprosy are available free of cost but the goal of elimination by 2000 AD was understood by only 47% of respondents. Radio was the single most effective means of providing information, education and communication about leprosy. The good response about leprosy knowledge in illiterates was comparable to others. A good knowledge may increase the attitude towards leprosy, case reporting, and motivation to be cured and decreases the deformity. So, intensification of health education is a must for achieving the goal.

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### So 394

#### MASS AWARENESS THROUGH VILLAGE MEETING

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A simple formula for mass-awareness without any expense. In my strategy, every NMA will conduct one village meeting in every week. Hence, there will be 4 meetings in a month and 48 meetings in a year. If there are 50 NMAs in the district, the total village meetings will be 2,400 in a year. The total village under one district is less than 2000 in maximum cases.

If it is good, it can be tried in N.L.E.P.

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#### AWARENESS ABOUT LEPROSY IN SUNSARI DISTRICT OF NEPAL

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wards leprosy, case reporting, and motivation to be cured and decreases the deformity. So, intensification of health education is a must for achieving the goal.

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### Me 15

#### DISABILITY AND REHABILITATION - MASS AWARENESS THROUGH MEDIA

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The persons lacking normal functional ability due to the disease Leprosy are within the social jurisdiction but except a few, they are not in tune with the mainstream. They also equally become the victim of self-stigmatisation and the loss of psycho-social equilibrium stimulates these persons even to be hostile to the society and to curse their own fate.

Social participation of the disabled is a multifunctional and multi-sectoral approach. It includes social, psychological, educational, occupational, economic and medical measures aiming at social assimilation of the Leprosy disabled.

The power-lobby needs equally to be aware regarding the dimension of the rehabilitation - problem and steps of solution. All these factors call for a planned change to influence the social attitude and media can contribute potentially to create a desired mass awareness level.

The coverage of rehabilitation services could broadly be incorporated by print, electronic and folk media. While print and electronic media have much influence on the literate and urban people, folk and non conventional methods have greater approach to the rural people.

In order to maintain the correct, integrated, uniform and comprehensive quality of communication, the media - persons should be oriented on the subject through a series of workshops organised all over the country. A syllabus could be worked out accordingly.

The respective programmes, persuasions, contacts and organisational activities will be undertaken by the rehabilitation service agencies but in order to maintain the harmony, pace and parity, it is suggested that a co-ordinating agency should be there on national level.

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**Me 60****EXPERIENCES OF DISTANCE LEARNING THROUGH TDCC**

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Training of Angan Wadi Supervisors in leprosy was conducted through TDCC (Training & Development Communication Channel) on 11-12 Oct'99. There are 45 DIET centres in Madhya Pradesh State, one in each undivided district. Angan Wadi Supervisors were invited as trainees in these DIET centres to receive the training and interact with the trainers. STD phone was made available in each centre to communicate with trainer present in Bhopal.

Live telecast of training programme was arranged at Bhopal - the capital of state. This training programme was designed, scripted and conducted by a panel of trainers. Video clippings from the field and live cases of leprosy for demonstration were used. A group of trainees and health administrators participated

13664 Angan Wadi Supervisors from all the districts attended the course, District leprosy officers and NLEP workers coordinated the training programme in respective districts. DANLEP provided technical support & facilitated organisation. Major advantages of this training programme were - entire state was covered within a day.

The quality of training was not diluted, and it was uniform all over. Interaction between trainees and state level administrators could take place. As a result greater involvement of Angan Wadi Workers in the state for leprosy elimination could be ensured.

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**Me 73****NEED FOR SENSITIVITY TO GENDER ISSUES IN IMPROVING QUALITY OF LEPROSY CONTROL PROGRAMMES - METHODOLOGY AND FINDINGS OF SENSITIZATION WORKSHOPS**

*Gitanjali Jena, O.Dowd Siobhan & D.Rajesh*, Secunderabad

70% of registered cases of leprosy are found in India. The inequalities between men and women in terms of quality of life, access to health and education in this huge continent are well documented. The authors contend that because the social, economic, physical and psychological experiences of men and women affected

by leprosy are different, their needs are different and that in order for leprosy to be eliminated, leprosy programmes need to understand these different needs and adapt their programmes accordingly. The paper describes the process by which leprosy workers (manager and field staff of LEpra) are given an understanding of gender and gender awareness, how they are encouraged to relate their knowledge of the different experiences of men and women affected by leprosy and analyze the causes of these differences.

This paper will draw on the materials and outputs from three workshops on gender awareness held in March, 2000. The paper outlines the type of responses leprosy programmes can adopt, to address the particular problems of women affected by leprosy, drawing on the ideas generated by staff in these workshops. Finally the paper concludes that this is just the first step in developing gender awareness within an institution and outlines what further steps can be taken to ensure that this issue becomes part of the mainstream of our work.

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**Me 152****TRANSFER OF POD TECHNOLOGY TO DISABLED CASES IN DISTRICT BALAGHAT**

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Prevention of disability (POD) is integral part of Multi Drug Therapy (MDT). Without POD, i.e. care while curing, acceptance of programme is generally poor and voluntary reporting is not encouraged. Therefore POD activities were performed as priority activities for leprosy elimination.

Mixed Group Residential camps (MGR camps) were organized in which disability management and education of community and new case detection, were performed simultaneously. In 1999, 18 MGR camps were held in district Balaghat. MGR camps comprise of three stakeholders - patients, providers and people. 609 disabled cases were trained for self care practices and disability management, 98 new cases of leprosy were registered. Community came forward to provide volunteers and cash contribution of Rs.1.9 lac.

The main activities performed during MGR camps were - Training in self care (morning-evening sessions) for disabled. NLEP workers and health workers acquired the knowledge in skills required for POD and then transfer it to disabled cases. The main POD practices followed were - hydro oleo therapy, physio therapy, identification

of impending ulcers & early nerve damage and protected use of anesthetic hands, feet & eyes.

Training of health workers/NLEP workers (morning-evening sessions) to learn clinical assessment, counseling skill, dressing of ulcer and Hydro Oleo Physio Exercise (HOPE). 125 MPWs and 52 NLEP workers were oriented & trained. Out patient services for voluntary reported and referred persons. Organising educative exhibition. Trialogue session daily in the afternoon to educate community and deal with socio psychological issues. Cultural activities to restore self esteem of disabled cases exploring and using the talent of disabled persons.

It is essential that leprosy workers are equipped with counseling skills and knowledge about management of primary & secondary impairment. Variety of leprosy cases are required for training in POD, which is a difficult task. Training the disabled (which are scattered in different villages) in self care and to verify that they have learnt, is also difficult, expensive and time consuming. Therefore the camp approach was adopted. It was noticed that behaviour change in leprosy affected persons in adopting self care practices was better in camp situation.

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### Me 193

#### LEPROSY TRAINING IN THE CHANGING SCENARIO

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The changing scenario of leprosy has created a need to reorganise the basic and orientation training programmes in leprosy so as to meet the training needs as per the demand of the situation.

In order to know the opinion of the programme managers and field workers, in the field 50 respondents have been consulted through mailed questionnaire and the quantitative summary of their perceptions with regard to the measures to be taken up to make the present leprosy training activities most suited to the present needs are presented in the paper.

The paper intends to present the perception of the respondents with regard to the basic training, its continuity, syllabi, teaching methodology, reference materials, duration, etc. for the leprosy workers of different categories viz. Paramedical Workers, Health Educators, Medical Officers and short term training programmes for Multi-purpose Workers, who ultimately will have to take up leprosy work in future after inte-

gration of vertical programme with general health services. The material presented in the paper may serve as a background for discussion on reorganisation of training programmes in Leprosy.

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### Me 208

#### USE OF CASE STUDY METHOD FOR EFFECTIVE TRAINING - LEARNING *Jayanti Shrivastava, Narayan Tiwari & B.L.Sharma*, Jabalpur, Madhya Pradesh

To initiate integrated leprosy services successfully and involve community for leprosy elimination a series of effective training programmes are required. These trainings have started in many places in Madhya Pradesh states. To achieve the objectives of training, the trainer can't compromise on training methodology. It is expected that training should bring desired change in the knowledge, attitude & behavior of trainees. In the field of leprosy only knowledge gained does not serve the purpose. Even the pre and post evaluation (performance of trainee and trainers) by structured questionnaire is not always adequate. The need of sensitization & motivation of trainees is often felt to influence their attitude & behaviour.

Real life case stories were documented and moulded as training tool. They are for better learning of different categories of trainees, e.g. community volunteers, health workers and medical officers. Training sessions were conducted with different categories of trainee using these stories. The main steps during training were - reading the stories in the class room by one participant and listening by group. Rereading the story by individuals quietly. Identification of issues based on information provided in the story. Answering the questions (given with story) by individual. Discussing the answers written, by small group of 4-5 trainees. Discussing the answers by group leaders in plenary session and reaching to consensus. Explaining and supporting the correct answers by facilitator through case demonstration, slide show, handouts and guest lectures. It has been noticed that - separate defreezing session is not required. Sensitization of trainees occurs. Emotional stirring & brain storming occurs easily. Involvement of all the trainees throughout the training period is seen (more as compared to traditional training).

The trainers who were conducting training by conventional methods, have started using the case stories for effective training/learning. A guide book & facilitator's notes have been prepared along with stories collected. Evaluation of training through case study method is yet to be evolved and tried.



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### Me 295

#### ROLE OF MEDIA IN LEPROSY ELIMINATION

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As we all are aware, media has a very crucial role and responsibility so far as developmental issues are concerned. Elimination of various diseases has been a challenge before mankind. Leprosy is one of them. All out efforts are being done to eliminate the disease within next couple of years. But they will have to be on two levels. One to eliminate it from the bodies and two, to eliminate from the minds. The social stigma associated with the disease is more painful and difficult to remove. This second part is more complex and naturally, more challenging. Here media definitely has a role to play.

When we say media, the major two parts of it are obviously, Print and Electronic Media. Print media has a

long and rich tradition in India. The Electronic Media is comparatively new, but has by now got rooted in the soil. Especially, because of the advent of several foreign channels that have already gatecrashed, not only the lavish drawing rooms but the slums and villages, the impact has increased many fold. Another advantage of this media is, its reach, even to the illiterates.

Apart from these two major parts, there are a couple of other forms, which are equally effective. They are, posters, slides, short films, TV spots containing social message, etc. They are powerful carriers of the message that one wants to convey, because of visual impact and catchy lines that go with them.

In a country like India, one cannot forget the great communicative power of folk arts. Even during the freedom movement, they were used very effectively. Kirtan and puppet shows also have a place when one thinks of the folk arts.

While discussing the importance and impact of these various forms of media, there will have to be a word of caution against excessive or wrong use of it. The effect could be totally negative. But if they are used judiciously and imaginatively, the argument for its role in eliminating the disease will be proved beyond doubts.

## POSTER ABSTRACTS

### Co 05

#### EFFECTIVENESS OF SKIN CAMP AS A MEANS OF HIDDEN LEPROSY CASES DETECTION

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We would like to put forth certain data to substantiate the effectiveness of skin camp as a means of hidden leprosy case detection in the post integration scenario in Vellore District, Tamil Nadu.

Till 1997, case detection activities were mainly by intensive survey and by routine school surveys in the vertical NLEP pattern.

After integration of the vertical NLEP pattern with the public health system in August 1997, case detection activities are mainly by Saturdays rapid photo surveys and multipurpose school surveys on Thursdays.

We would like to present certain findings and share our experiences regarding the conduct of the skin camp in Vellore District along with the NGOs from January 1998 to June 2000.

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Tamil Nadu

### Co 12

#### ACTIVE CASE DETECTION VERSUS VOLUNTARY REPORTING IN LEPROSY CONTROL PROGRAMME - AN EVALUATION

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Aundipatti Taluk in Tamilnadu, India is endemic for leprosy. Intensive leprosy control programme has been carried out by Arogya Agam, a local NGO since 3 decades. Prevalence of leprosy has dropped from 20 to less than 2 per 10,000 population (year 2000). Traditional method of case detection (by skin and nerve examination of whole population) has become redundant. Even rapid enquiry surveys using flash cards are becoming less effective. There has been a fear that minimising active case detection would lead to failure of detection of leprosy cases at an early stage. Here we attempted to study the pattern of new case detection in the defined project area.

Leprosy sub-centre in Kadamalaikundu village is far away from headquarters of this project. It is the sub-centre with the highest prevalence of leprosy in the project area. There are 49 leprosy cases (includes 2 relapses) registered between January 1999 to June 2000.

Among the new cases of leprosy, 67% reported directly to the leprosy programme staff when he was present in the villages for leprosy related work other than

case detection. Only 20% of total cases registered were detected by case detection survey.

This clearly indicate that health awareness and availability of health care services are the key factors in leprosy control work at this moment when there is a risk of elimination of leprosy services

services.

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The Bharuch District is a high endemic district of Gujarat State. The total 11 talukas were taken for well planned Leprosy Elimination Campaign. Till today 9 talukas have completed the LECs.

Total 1397 new leprosy patients were detected out of which 415 are children, 2 are with grade II deformity & 664 patients are female patients. The details of the results will be discussed during the presentation.

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### Co 64

#### JUSTIFICATION FOR SAPEL (WITH INNOVATIVE METHODOLOGY) AS A MEANS TO REACH THE ELIMINATION GOAL BY MARCH 2003 AD, VELLORE DISTRICT, TAMILNADU

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It is evident that additional efforts, new strategies and intensification of the current NLEP activities is required to reach the elimination goal.

The neglected population groups living in geographically difficult to access areas and cases that remain undetected in that group have to be addressed by innovative special projects to reach the elimination goal.

In this context a special action project (SAPEL) was conducted in our district during September 1999. The joint action plan was approved by the Additional Director of Medical and Rural Health Services (Leprosy) Chennai-6 and was accepted and funded by DANLEP, Chennai.

It was decided to take up the tribal areas of Jawadhi Hills covering a population of around 18,000.

The entire tribal area of Jawadhi Hills was covered by the Government Leprosy Control Unit, Jammanamathur, until disbanded in 1991. After 1991 St. Thomas Hospital, Chetpet and Government Primary Health Centre are covering these areas with little co-ordination.

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#### RESULTS OF LECs IN BHARUCH DISTRICT

*C.V.Kande, A.K.Chauhan, B.C.Kadiwala, Dr.P.V.Dave & Dr.B.S.Patel* Ahmedabad

### Co 195

#### A STUDY OF THE TRENDS OF OCCURENCE OF NEW CASES DURING MLEC AND POST MLEC PERIODS

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LEPRA India has established a project in Adilabad district in Andhra Pradesh in 1997. The project has implemented SET methodology and 833 new cases were detected before implementation of I MLEC.

MLEC was implemented in the project during April 1, 1998. In this campaign, 126 new cases were recorded. This type classification, disability status and duration of disease of these cases have been analysed.

The project continued its active and passive case finding method for two years before the II MLEC was implemented. During this period, 44 new cases were recorded. Of them 42 were recorded by active case finding methods, no cases were referred by PHC staff, while 2 cases were recorded by voluntary reporting. The trends of changes in the disease profile are analysed. A questionnaire was administered to a sample of the cases recorded by different modes to understand the perceptions and recall of the interventions of MLEC implemented earlier.

Similar analysis of findings of MLEC II and the cases recorded in the post MLEC period has been made. A questionnaire was administered to the health staff of PHCs to assess the retention levels of the inputs of MLEC - I and MLEC - II and their contribution to leprosy programme in the post MLEC periods.

The findings of impact of MLEC programmes on subsequent voluntary reporting and the levels of participation of PHC staff in the post - MLEC periods were analysed and discussed.

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### Co 233

#### **SUSTAINING LEPROSY ELIMINATION FORCE BY COMBINING TB CONTROL**

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Intensive leprosy control programme activities has resulted in a significant reduction in prevalence of leprosy. This also has led to intergration of leprosy services with Primary Health Care (PHC) services. Though it seems to be the ultimate goal, the PHC system is not geared to take over the leprosy control activities. There are other health programmes that require intensified activities. Tuberculosis Control Programme is one of the priority areas requiring such treatment. Management of Leprosy and TB has many similarities including the programme aspects. The leprosy programme staff are well trained and experienced to handle both the programmes.

Nine voluntary organisations supported by Damien Foundation India Trust (DFIT) have been involved in National Leprosy Eradication Programme (NLEP) covering a population of 1397348. These agencies started implementing TB control programme using DOTS strategy since 1998. Strategies for case detection and treatment delivery for leprosy programme were modified. Different groups of personnel like PHC staff and volunteers were used for implementation of DOTS. The performance of leprosy programme has been maintained. They could achieve a cure rate of 80% for TB cases. Leprosy programme staff performed well with short training on DOTS (TB).

We have a large work force of trained personnel for leprosy programme in the country. They have the expertise in supervised treatment delivery system. Instead of wiping out this special group why not we make use of this trained manpower in an efficient manner in an area of need?

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### Co 246

#### **STUDY ON NEW MEASURES ON EARLY CASE FINDING IN A LOW LEPROSY ENDEMIC SITUATION**

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Objective : The new measures of early case-finding in a low leprosy situation were studied.

Methods : We set up the referral system on leprosy suspects, rare skin diseases in health facilities all over the county, and screen the high risk population with leprosy moved into the county from leprosy high epidemic areas of Yunnan, Guizhou and Sichuan Provinces for leprosy. We also let the persons affected by leprosy play a key role in their own communities in finding new active cases.

Results : The results showed that a total of 5 new leprosy cases have been detected by referral system and reporting of persons affected by leprosy since 1996.

Conclusions : It is feasible to use these measures to do case-finding in a low leprosy situation, and should be extended to other areas with a leprosy problem in case-finding.

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### Co 247

#### **FACTORS AFFECTING 'LEPROSY 3 EARLYNESS' BY SIDE EFFECT OF LEPROSY ELIMINATION AND ITS COUNTER MEASURES**

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Objective : To approach how to improve the work of early case-finding, early diagnosis and early treatment in a low situation of leprosy prevalence.

Methods : To find and study the factors which effect the 'Leprosy 3-earliness' and then put forward the counter-measures.

Results : These factors are as follows : Firstly, the professional staff relaxed their will to fight against leprosy after province stopped the checking of leprosy elimination. Secondly, the leaders who worked for the professional organisations, transferred their attention from leprosy control to STD control. Thirdly, the network for the function of detecting new cases weakened. Fourthly, the quality of case diagnosis declined. Lastly, higher disability rate existing in new cases affect the social care about the leprosy enterprise. The counter-measures for that are to strengthen the management of professional organisations and to improve the establishment of professional teams.

Conclusions : More efforts need to be adopted in the making of the plan for the leprosy control in the future.

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**Co 252****REALIZE THE TARGET OF 'ELIMINATE LEPROSY BASICALLY' IN CHINA - SUGGESTING CHANGE THE TARGET OF 'ELIMINATE LEPROSY BASICALLY' TO 'ELIMINATE LEPROSY ORIGINAL CONTAGION BASICALLY'**

*Liu Song Ta*, The Public Health Bureau of Guangdong Province, China

Comparing with tuberculosis, this report shows 5 characteristics of leprosy. It has low contagion and easy to treat, but it is difficult to prevent and perceive. It induces high rate of disability and dehabilitates badly. It is well known that leprosy damage to one's looking seriously. The patients live poor life, with social discrimination and exclusion. The society cares little of them, yet it is still reducing. So it is the social economic problem more than medical technical assistance, the rehabilitation more than treatment to the work of leprosy. Hence we should make definite our duty and clear up misunderstanding. We suggest the target which has been called eliminate leprosy basically should be changed into eliminating the original contagion of leprosy basically. On the other hand, it suggests to break the closed state on leprosy and encourage the social workers, workers on rehabilitation as well as the every aspect of society to cooperate the work on eliminating the leprosy.

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At this meeting based on an explanation of the significance of LEC, a realistic detailed proposal for conducting LEC, including time frame and timing of LEC, selected regions, steps and approaches taken, was set up. Orientation workshops for heads of local (town/township level) governments and health centers were held at county level to secure political and administrative support for LEC at peripheral level. Before and during the launch, intensive information dissemination campaign using various forms of media, such as TV/radio reports/interview and display of leprosy posters/health education board, was undertaken to increase the level of public awareness on leprosy motivating people of all walks of life to notify leprosy suspects. In the meantime, physical examinations for household contacts of MB patients were done by professionals. A confirmation team of leprosy experts engaged for confirmation activity. In Xinhua and Bijie two cities, 269 suspected cases, 2354 contacts and 673 cures were reported, examined and followed up detecting 37 new patients and 4 relapses including MB 25 and PB 16, of which BI positive case 22 and children 3, with average disease duration of 42 months. Disability (WHO Grade II) rate was 51.35% (19/

37). The number of newly detected cases in 2 cities during LEC accounted for 76.67% and

69.23% of that during the year. The findings demonstrated that LEC was an effective intervention to detect hidden cases within a relatively short period of time.

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**Co 253****LEPROSY ELIMINATION CAMPAIGN IN TWO CITIES OF GUIZHOU PROVINCE**

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The overall objective was to assess the efficacy of implementing LEC in case finding so as to support the achievement of the goal of basic eradication of leprosy in Guizhou Province. Advocacy meeting was organized by the Provincial Health Service. The participants were heads of health services and leprosy professional units of Xinyi and Bijie, two cities where LECs were scheduled to be put into practice.

**Co 254****AN ANALYSIS OF 106 NEWLY DETECTED PATIENTS WITH LEPROSY**

*Ouyang Hua*, *Luo Shilong* & *Zhang Huanbo*

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Mainly through focus survey, clue survey and contact examination together with offering cash rewards for case reporting and skin clinic detection, from 1986 to 1999 in Anlong County of Guizhou Province, 106 newly detected leprosy patients were diagnosed, including 71MB, 35 PB with a type ratio of 2:1, and 75 cases of them with a disease duration of 2 or less than 2 years with an early detection rate of 71%. Twenty of these 106 patients were found to have WHO II grade disability, a disability rate of 18.8%. As for mode of detection, self reporting, skin clinic detection and clue screening not only proved more efficient, but also cost-effective. Even though focus survey and contact exam-



ination were more expensive and at high cost of time and labour for only a small number of patients newly detected, but they can be contributed to early case finding and epidemic situation monitoring. In addition, making peripheral health services in full play and strengthening health education about leprosy will be essential important measures in early case finding.

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### Co 255

#### ANALYSIS OF NEWLY DETECTED LEPROSY CASES IN XINHUA CITY IN CHINA - DURING 1990-1999

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To understand the situation of leprosy after achieving basic eradication of leprosy in Xinhua City, find out the remaining problems and determinate the priorities in leprosy control in the future. Data of individual records for all leprosy cases detected during 1990 and 1999 were statistically analysed. A total of 36 leprosy cases were detected during the 10 years, 28 (77.78%) in the first 6 years and 8 (22.22%) in the recent 4 years. Ratio of male to female was 3:1 and mean age at onset was 43.5 years. The cases with MB leprosy (77.78%) were significantly higher than those with PB leprosy, and 75% of cases were positive for BI. There were 69.44% of cases whose detection was delayed for less than 3 years, 33.34% whose infection was due to familial contact, and 75% whose disease was detected through out-patient department. The number of new cases has significantly decreased after achieving basic eradication of leprosy. In addition, there is a trend of increase in age at detection, shortening of delay period and increase in type ratio. It is worth recommending that leprosy cases are detected through out-patient skin department.

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### Co 256

#### EVALUATION OF EFFECTIVENESS OF LEPROSY ELIMINATION CAMPAIGNS - CASE FINDINGS IN HUNAN PROVINCE

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To detect the hidden leprosy cases and strengthen the leprosy control through carrying out Leprosy Elimina-

tion Campaigns in local areas. Clue surveys and mobile medical team services were carried out using a small amount of budget to detect early leprosy cases. A total of 298 leprosy-suspected individuals were reported by paramedical workers during the Leprosy Elimination Campaigns: (LEC) for a period of 2.5 months in 2 counties. Among them, 32 were confirmed to have leprosy. The number of cases was 2 times of that detected in the previous year in the same areas. It is important to mobilize the local personnel resource, integrate the leprosy control into general health services, and obtain the financial support in order to detect and treat leprosy cases as early as possible.

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### Co 259

#### AN APPROACH TO EARLY CASE FINDING, EARLY DIAGNOSIS AND EARLY TREATMENT OF LEPROSY

*Tao Lang & Lu Jianhua*

The crux of leprosy endemecity from control to eradication is no new patients to be detected by the maximum of case-finding and patient treatment. Now, for being in a low endemic status, it is necessary to study the work in aspects of the early case-finding, early diagnosis and early treatment leprosy control. The authors analysed the factors influencing the early work and put forward the appropriate measures which are hoped to be a directive function and to create a condition for leprosy eradication.

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### Co 263

#### ON EARLY CASE DETECTION : OBSERVATION AND DIAGNOSIS AMONG SUSPECTED CASES

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Early detection and early diagnosis are important contributions to the eradication of leprosy. Since the year of 1983, 1276 suspected early leprosy cases have accumulatively been registered with regular follow-up, timely diagnosis and removal if necessary. Out of 1276 suspected cases, 127 (9.95%) were diagnosed as having leprosy. Mode of detection, age at diagnosis, disease duration, type ratio, skin manifestations and nerve impairments, bacteriological status, histopathological changes, degree of disability, culture background and

profession of these 127 patients were discussed, and consequent suggestions were made.

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### Co 267

#### ON CORRELATED FACTORS IN EARLY LEPROSY CASE FINDING

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An analysis of 143 early leprosy patients detected in Bijie Prefecture of Guizhou Province demonstrated that among them there was a remarkable predominance of those of large income, higher educational level and good private hygiene, and the early case detection rate gradually increased in pace with the growth of economy, rise of cultural level, improvement of hygiene environment and intensification of health education as well. It is observed that early leprosy case detection rate is closely related with health education as well as patients economic status, culture level and hygiene condition. For early leprosy finding activities to be more effective, careful considerations must be required in the just mentioned areas in leprosy control.

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### Co 270

#### A STUDY ON ESTABLISHMENT AND OPERATION OF LEPROSY CONTROL MODEL AT THE GRASSROOTS LEVEL IN THE HEALTH SYSTEM REFORMS

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It is very important to establish the leprosy control model at the grass-roots level in the health system reforms. Not only can it consolidate achievements achieved in the past, but also promotes realization of the goal of leprosy eradication. After briefly reviewing the history of leprosy in Jiangsu Province, for the reason of health reform, the authors expound the importance and necessity to keep and improve leprosy control network at grass-roots level, put forward some ideas and a model to reorganize the useful network and discuss the network operation for leprosy work in the future. Lastly, the authors consider that integrating the

leprosy control work into the primary health care system and community-based health service is the direction of the future work and the insurance of leprosy eradication.

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### Co 271

#### EPIDEMIOLOGICAL ANALYSIS OF LEPROSY IN XUZHOU PREFECTURE

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**Objective :** Through epidemiological analysis of leprosy in Xuzhou Prefecture to get the tendency of leprosy prevalence and give effective measures for controlling the endemic.

**Methods :** To analyse the indexes of leprosy epidemiology which happened from 1973 to 1999 in aspects of the prevalence, the incidence rate, relapses rate, disability rate, prevelant territory and proportion of children.

**Results :** The prevalence dropped down continuing annually ,but its speed of decreasing is more and more slower and to be showed as a flat line in recent years. The average incidence of last 5 years is a little bit higher than the preceding one. The disability rate of living cases is

61.6%.

**Conclusions :** Even though the leprosy prevalence has been controlled effectively through tough efforts, we need to boost the passion for the leprosy work and ongoing studies on the management of early case-finding , early diagnosis & early treatment and rehabilitation measures.

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### Co 274

#### STRATEGIES OF LEPROSY CONTROL USED IN LOW ENDEMIC SITUATIONS IN GUANGDONG PROVINCE

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The number of the total registered leprosy patients in Guangdong Province is 94,667. It ranks the first in China. The highest annual prevalence rate is 1.14%. Guangdong was once the high endemic area for leprosy. In 1999, there were only 370 active patients, the prevalence rate decreased to 0.005%. Guangdong has become a low endemic area for this past five years. However, there are still about 130 active patients appearing every year and the number decreased slowly. The following measures are taken under the low endemic situations to



maintain the achievement of leprosy control; to lay stress on the key points and provide different directions to different areas; to implement special action programmes in the high endemic areas; to strengthen the surveillance for the floating population and the management of leprosy patients; to establish a system of rewards for the early case-finding and the use of MDT; to strengthen the training of paramedical workers of the leprosy prevention nets; to widely launch leprosy knowledge propaganda and health education. We have gained much experience in the work and the achievements of leprosy control are solidified.

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### Co 275

#### PRIMARY HEALTH NET IS THE BASIC OF LEPROSY CONTROL

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Guangdong Province is in the south of China. The area is 170,000 square kilometers and the population is 70 million. Guangdong used to be a high leprosy prevalent province. The registered leprosy accumulated to 94667, about 1/5 of the total number of the country. Through decades of effort of comprehensive control work the achievements are great: the total active patients have decreased greatly (370 cases, 1999), the incidence (0.16/ 100000, 1999) and prevalence (0.54/100000) have remarkably declined; of 100 counties in Guangdong Province, 98 counties have reached the goal of leprosy elimination.

Due to the drop of the incidence and prevalence, we meet some new challenges: the case detection is more and more difficult with 18% second degree disability rate upon diagnosis, the methods to detect new patients have been changed from general survey to clue survey, epidemic area investigation, awards for case reporting and skin disease clinic service, maintenance of vertical system of leprosy control is very expensive.

Foundation of primary health net in urban and rural areas widely have given us a chance for efficient leprosy control at lower epidemic condition. One of the essential components of primary health care is the prevention and control of locally endemic diseases. Early leprosy case detection and rehabilitation can be effectively performed together with control of other diseases and with the improvement of economic and social conditions.

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### Co 278

#### AN OBSERVATION OF LEPROSY ENDEMICITY AFTER ACCOMPLISHMENT OF LEPROSY BASIC ELIMINATION IN RUDONG COUNTY

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Leprosy always had been a middle endemicity in Rudong county in its history. The county had attained the goal of the leprosy basic elimination and passed the evaluation by provincial government since 1990. From then on, according to the new situation of leprosy control, the local government and professional organizations have been taking comprehensive measures for leprosy control for 10 years to consolidate and develop the achievements which were obtained in the past.

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### Co 281

#### STUDIES ON FACTORS INFLUENCING EARLY DETECTION, DIAGNOSIS AND TREATMENT IN FLOATING POPULATION AND THEIR STRATEGIES

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Focusing on the situation of that there is a leprosy prevalence of as high as 1 per 10000 and the majority of patients were passively detected when they had been with obvious symptoms and even disabilities, this paper analyzed the factors influencing early detection, diagnosis and treatment of leprosy. The results showed that the factors were mainly as follows:

- (1) Lack of health education of leprosy in the floating population;
- (2) Weakness of the health network at the local areas and shortage of professional expertise among paramedical workers, resulting in misdiagnosis or loss of diagnosis;
- (3) Lack of routine health examination for the floating population when they were employed by enterprises in most of areas.

Based upon these results, it is suggested that it is necessary to strengthen the management of the floating population, establish the regulations of routine health examination, mobilize the roles of primary health care, conduct health education, and promote patients self reporting. In addition, it is very important to integrate leprosy control into community health care under the technical guidance and supervision of leprosy professional institutions.

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**Co 283****DETECTION OF LEPROSY CASES IN GUANGDONG, 1990-1999***Dr.Z.S.Zhao & Dr.D.C.Zheng, Guangzhou, China*

Guangdong province was one of the most serious leprosy endemic areas in China. The total number of registered cases was 94667 by the end of year 1999. The highest prevalence rate was 114/100 000 in 1961. Through implementation of leprosy control program from 1990-1999, the prevalent and incident rate were 2.66/100000 and 0.36/100000 respectively in 1990. From 1990-1999, annual decreasing rate of the incidence was slower than prevalence. The average MB ratio of new case was 0.66 during 1990-1999. The proportion of detecting case was 81.37% by the clinic of skin disease in the same period. The rate of case of delaying diagnosis over two years was 23.14% in this period. The data indicates that :

1) Although incidence rate of leprosy already was remarkably low in this province, eradication of leprosy still need a long time. 2) Main approach of detection case is passive by skin disease clinic in low epidemic area 3) It is important to train dermatologists with leprosy knowledge regularly for reducing the rate of delaying diagnosis.

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**Co 323****IMPACT OF NLEC ON ROUTINE LEPROSY CONTROL ACTIVITIES IN FOUR HIGH PREVALENCE DISTRICTS OF WEST NEPAL***Himalaya Dev Sigdel, Shailendra Gautam & Alison Anderson, International Nepal Fellowship, Pokhara, Nepal*

Considering the high prevalence of leprosy cases in many districts of Nepal, the National Leprosy Elimination Campaign (NLEC) was organized by His Majesty's Government of Nepal (HMG/N) in January 1999. The INF Leprosy Control Programme assisted HMG/N in the conduction of the campaign in 4 districts of the Western region of Nepal.

During the 6 day campaign, house-to-house visits were conducted in every village and as a result 1284 new cases were found, PB=560 (43%), MB=724 (57%). In each district the number of cases found during the 6 days of NLEC was higher than the normal annual total. It was expected to find a lot of backlog cases but the outcome suggests that this might not be the case. The MB proportion was lower than routinely seen in the districts and the child proportion among newly detected cases did not significantly differ from previous years. Despite of a house-to-house approach the male female ratio was still high (1.7). Disability proportion

among newly detected cases was increased (14.5%) but was still within the variation that would be expected.

In summary case detection was very high in all 4 districts during NLEC but beside the increased case detection rate other key indicators (child proportion, disability proportion and male female ratio) were found within the normal variation. The impact of NLEC regarding increased community awareness, reduced social stigma and training for basic health staff and volunteers should not be underestimated.

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**Co 338****NATIONAL COMPUTERIZED LEPROSY INFORMATION SYSTEM IN KOREA***Dr.Jong-Pill Kim, Dr.Hang-Kye Shin & Dr.Young-Hoon Ko, Korean Leprosy Control Association, Kyonggi-Do, Korea*

For the integrated leprosy control, including the elimination of leprosy and the leprosy related activities, the collection and analysis of the accurate data is essential. In Korea, we have applied the computerized information system of the leprosy control. This system was designed for data collection as well as data analysis. The major functions of this system include data entry, data transfer, from local level to central level, data sum-up, and production of information, including epidemiological and clinical information and information for decision-making. Firstly we used this system for traditional leprosy control work only. Because the basic concept of our system's data structure is more flexible than other's, we try that we can use it more widely, for the leprosy related activity now. We think that this system has been supported effectively by our integrated leprosy control programme in Korea. We therefore present the computerized leprosy information system of Korea.

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**Co 396****CASE DETECTION IN N.L.E.P.***D.P.Verma, Saoukt Ali Ayub, Pradeep Narayan & Dr.Rajendra Paswan New Delhi*



A simplified formula for regular case detection activities with only small extra expenditure. We have planned group survey two days in a week from 6 a.m to 8 a.m. One specified vehicle will carry two groups and take them back. By this time maximum population is available at home.

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### Co 397

#### EVALUATION OF MOBILE LEPROSY CLINIC SERVICES IN MIDWESTERN REGION

**Gurung L.B., Morrison C & MacRorie R.A.**, INF Tuberculosis Leprosy Project, Surkhet, Nepal

During a process of hand-over of leprosy clinic services from NGO to government health services, an evaluation of the quality of care was undertaken. Organisational structure was well developed in the NGO but work in government health posts, require greater training, supervision and management. The NGO specialist staff gave good service, but failed to fully address needs for privacy during patient examinations and health education. The government health service may not have the capacity to provide through care and reliable treatment. The mobile clinic programme approved to be costly but sustainable within the context of NGO provision. Quality of care indicators for future monitoring of the programme have been developed.

This study was undertaken in partial fulfillment of the Master in Community Health course at the Liverpool School of Tropical Medicine, 1998. The study evaluated the activities of a mobile leprosy clinic programme in the mid western region of Nepal. The client for the study was the Programme Director of International Nepal Fellowship (INF), Tuberculosis Leprosy Project (TLP).

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### Co 398

#### POST ASSESSMENT STUDY TO ASSESS THE IMPACT OF MLEC PHASE II DONE IN JANUARY 2000

**G.Elangovan & V.C.Ganesan** Chennai

Introduction: It was aimed to reassess the improvement in knowledge, attitude and practice of public, pa-

tients and treatment providers among the same persons who were interviewed.

#### Context

1. To evaluate the improvement in community awareness about leprosy in the post MLEC context.
2. To assess the improvement in quality of service available to the patients in the post MLEC context.
3. To assess the improvement in knowledge about leprosy and programme of service providers in the post MLEC context.
4. To assess the improvement in MDT indicators in the post MLEC context.

a. MDT utilisation

b. Availability of quality of drugs

c. Availability of health facilities

d. Case holding

Conclusion: Massive mobilisation of resources and personnel to eliminate leprosy has paid rich dividend, in addition to massive case detection.

1. Improvement of knowledge, attitude and practice of community and patients/treatment providers/ maximum utilisation of services.

MLEC exhibited the desired goal of elimination of leprosy.

1. Regular campaign.

2. Special emphasis may be laid to cover most female gender.

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### Co 399

#### NLEP - CALENDAR OF ACTIVITIES

**Arvind Kumar, D.P.Verma, A.Pandey & Dr.S.K.Sinha** New Delhi

The brief presentation of yearly calendar of activities of NLEP on a page. All the important activities of NLEP are covered. Anybody can suggest or improve the calendar to help NLEP activities.

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### Ep 11

#### CLUSTERED LEPROSY CASES IN SOUTH INDIA

*J.Arockiasamy, S.Balasubramanian, P.Jayasree, Aha Danil Raj, N.Venkatesan,*

*D.Augusein, T.Subba Rao & M.D.Gupte*

Controlled, double blind, randomized, prophylactic leprosy vaccine trial was conducted in South India in an endemic area for leprosy, covering 48 panchayats comprising of 264 contiguous villages and 3,00,000 people from Sriperumbudur and Kancheepuram taluks of Chingleput district (old), Tamil Nadu, South India.

Intake for the study was completed in two and half years from January 1991. After enumeration, the population in the study area was screened for leprosy by paramedical workers trained in leprosy. All suspects and cases identified by the paramedical workers were examined by one of the senior workers for confirmation of diagnosis. Two resurveys were carried out, the first one starting immediately after completion of vaccination and the second one starting two years after completion of the first resurvey. The procedures used in the resurveys were generally similar to the intake.

A total of 6486 cases of leprosy were diagnosed after examining 2,55,777 individuals at intake. In the first resurvey, 625 incidence cases were detected. In the second resurvey, 413-cases were detected and 41 of these cases were not examined in the first resurvey. Analysis of prevalence and incidence rate was done for all the panchayats and panchayat unions. Clustering of incidence cases was examined and reported in this paper.

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### Ep 98

#### AN INVESTIGATION OF LIVING STYLE PATTERN AND BEHAVIOUR OF THE FAMILIES OF LEPROSY PATIENTS

*Suneel R.Qamra & Haresh Kumar, Central JALMA Institute For Leprosy, Agra*

The living style pattern and behaviour of the leprosy families has been understood through patients attending OPD of the CJIL to observe role, if any, in transmitting leprosy to other family members. Out of 100 patients studied for this, 30 patients were belonging to those families, where more than one leprosy case exist and were categorized as Present Group. Remaining 70 patients did not have any other case in their families than self and categorized as Absent Group.

50% families from Present Group resides in crowded

kachha house compared to Absent Group (27%). 70-80% families of both the groups were using common soap, towel, clothes and beddings etc. before their family members acquire leprosy but higher percentage of patients of the absent group (40%) after contracting leprosy stopped sharing compared to present group (20%). Similar findings were observed in terms of sharing foods, utensils and water.

53% and 33% of the studied patients have disclosed about leprosy to families and community respectively. Further, the literate patients had significantly hidden the disease more compared to illiterate patients. In the absent group, marital relation with leprosy afflicted spouse either reported to be disturbed or distance is maintained. However, indifferent behaviour among family members was almost negligible in present group. On the other hand, 70% of the patients, who disclosed their disease, told that community people do not interact with us.

Thus the findings of the study suggest that repeated contacts with leprosy patients promote transmission of leprosy to others and initial isolation at family level with understanding may probably help reducing transmission.

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### Ep 106

#### ANALYSIS OF EPIDEMIOLOGICAL FINDINGS OF MLEC I AND MLEC II IN TRIBAL DISTRICTS IN ORISSA

*B.R.Mahapatra, K.Sudhakar & R.A.Bhuskade Secunderabad*

Koraput Leprosy Project (KORALEP) of LEPRO India covering a population of 1.5 million in tribal districts in Orissa was established in 1991. The population is predominantly tribal and the area is vast and the 6096 villages are mostly located in difficult to reach areas. 14201 cases were recorded and treated with MDT.

MLEC was implemented in the project area in 1998 and 2000. Active case search was adopted in both campaigns. Staff of Koralep and PHCs, Anganwadi workers and local volunteers were drafted to conduct MLEC.

1543 cases were recorded in I MLEC while in II MLEC 509 cases were recorded. Analysis of cases recorded as per type, age, sex, disability status has been made both for cases detected during MLEC and in the intervening period by the active and passive methods of cases finding in the project. Interesting distribution trends of the disease, particularly in relation to gender, were observed. These trends and the possible reasons for trend differences are analysed and discussed.



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### Ep 117

#### EPIDEMIOLOGICAL ASSESSMENT OF MONOLESION LEPROSY CASES

**V.G.Mathew & Dr.Helen Roberts** The Leprosy Mis-  
sion, Calcutta

##### INTRODUCTION:

The epidemiological significance of the mono lesion cases is not completely understood till today. It is observed that the disease often starts with a single lesion.

##### OBJECTIVE:

The objective of this study is to determine the epidemiological factors and to determine the best mode of early detection for the control programme especially in the urban set up.

##### DESIGN, PARTICIPANTS AND SETTING:

A retrospective analysis of 308 mono lesion cases registered at Calcutta urban leprosy control programme of The Leprosy Mission during the year 1998 -1999.

##### MAIN OUTCOME MEASURES:

Percentage of mono lesion leprosy cases from specified age group, sex distribution, adult child distribution and various modes of detection.

##### RESULTS:

267 out of 308 cases are from the younger age group <40 years (87%). There is not much difference in sex distribution (11:9). Adult child ratio is 33:17. 90% of these cases were detected by active case finding methods.

##### CONCLUSIONS:

From this study, it is concluded that early detection of mono lesion cases in an urban setup requires an active case finding method and therefore should be emphasised.

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### Ep 183

#### A GENETIC STUDY OF LEPROSY : PEDIGREE PATTERNS AND SEGREGATION ANALYSIS

**Venkat Ram Reddy, Meher Vani, Muzaffarullah, Lavanya Suneetha, Raj Gopal Reddy & Sujai Suneetha,** Lepra India, Hyderabad

Pedigree analysis provides information on genetic determination of susceptibility to infectious diseases. Segregation analysis on pedigrees can suggest the pattern of inheritance of susceptibility gene/s. Generally, the transmission pattern of disease within a pedigree is compared to a variety of transmission models to ascertain whether it has a dominant, recessive or co-dominant pattern.

In this prospective study, we questioned 28 leprosy patients who had 2 or more members in the family affected by leprosy and their pedigree patterns were drawn upto two generations. The study was carried out at Dhoolpet Leprosy Research Centre, which is an out patient clinic where patients are self-drawn or referred for diagnosis and treatment of leprosy.

The results show 1 family with six members, 1 with five members, 7 with three members and 17 with two members affected. The pattern of affected versus unaffected within the generation was 69:114 (1:1.7). The mean sibship size was 5. We found considerable sparing of the disease among siblings. The pattern of affected versus unaffected among siblings was 42:86 (1:2). Across the generation in 4 pedigrees, uncles were affected. The proportion of females and males affected in the pedigrees were 24:43 (1:1.8). Consanguinity as another variable was noted in 4 pedigrees. Segregation analysis suggests that in 76% of the pedigrees, a dominant inheritance pattern was present and in 24% of the pedigrees, the pattern was undetermined.

Detailed analysis of different pedigree patterns in relation to segregation, type of leprosy and other variables will be presented.

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### Ep 225

#### RANDOM EXAMINATION AND ITS IMPLICATIONS IN THE VACCINE TRIAL IN THE NEW LEPROSY SCENARIO

**R.L.J.De Britto, N.Uthayakumaran, S.Kannan, Mercy Mallika, B.Sridhar, N.Ramachandran, R.Gopinath & M.D.Gupte** Chennai

In the vaccine trial, paramedical workers are supposed to screen all the individuals with an expected minimum coverage of 90% examination in all the villages. About 10% of the total population were supposed to be examined according to the randomly identified households by a medical examiner or a senior worker. They will examine all the available individuals who had no

evidence of leprosy according to the paramedical workers diagnosis.

With the advent of Multi Drug Therapy from 1986 and its dramatic influence over leprosy disease, the reduction of prevalence/incidence rates is seen almost all over the country. As such a similar trend has to be reflected in our data from the vaccine trial. Number of new or missed cases is likely to be substantially low after the intake and the two resurveys. This is likely because with a lesser prevalence /incidence rate coupled with vaccine efficacy, the transmission rate of disease of leprosy also need to be minimal in the vaccine trial area. The paramedical workers were missing considerable number of cases during intake period as assessed by the random checking of non-cases.

The impacts of random examination in the changed scenario of leprosy and sensitivity and specificity levels are studied with the available data. The role of random examination in maintaining the sensitivity and specificity levels and its continuance may be discussed.

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### Ep 240

#### EPIDEMIOLOGICAL ANALYSIS OF LEPROSY IN JIANGSU PROVINCE

*Chen Ning, Shao Suide & Yu Hao*, Jiangsu Provincial Institute Of Dermatology, Nanjing, China

To analyze epidemiological trends of leprosy in Jiangsu Province and provide the scientific basis for formulating the strategies aiming at eradication of leprosy. Leprosy records and the relevant data were used for the analysis. Jiangsu Province is a former leprosy-endemic area where leprosy was prevalent in 100% of counties/cities or 90.9% of townships with an uneven distribution of the disease in the past. Leprosy control was initiated in 1950s in Jiangsu Province. Through efforts for near 50 years, a lot of leprosy cases were cured and the prevalence, incidence and detection rates have decreased to 0.5 per 100000 population. There were no child cases in the past 3 years. By the end of 1998, there were 306 active leprosy cases. Jiangsu Province has achieved the basic elimination of leprosy in terms of county and passed the evaluation of Ministry of Health.

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### Ep 241

#### THE CONTRASTIVE ANALYSIS OF 87 CASES BETWEEN THE INFECTIOUS SOURCE OF LEPROSY AND THE FINDING MANNER

*Ge Zhaofo & Wang Biao*, Dermatoses Control Hospital Of Jianhu County, Jiangsu, China

**Objective :** To approach the relationship between the infectious source and occurrence of leprosy to find new patients in early stage in time.

**Methods :** Analysing and reviewing patients individual records which were newly noted from 1980 to 1999. 47 cases (54.02%) had definite source of infection and 40 cases (45.98%) had not. 51 cases were found passively in clinics and 36 cases were found actively.

**Conclusions :** MB patients were the major source of infection. Finding patients actively should have aim. We should strengthen examining diseases professionally and reporting disease in network.

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### Ep 248

#### EPIDERMIOLOGY OF LEPROSY THROUGH 1985-1999 IN SHENZHEN

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**OBJECTIVE :** To study the epidermiology of leprosy in Shenzhen.

**METHOD :** Total 87 cases of reported registered leprosy were analyzed among population with Shenzhen permanent residence and temporary residence from 1985 to 1999.

**RESULTS AND CONCLUSIONS :** It was shown that: 38 cases were from population with Shenzhen permanent residence, making up 43.7%, and 49 cases were those with temporary residence, making up 56.3%, with male : female proportion 2.6 : 1, majority of them are from 20 to 39 years old. The type is mainly of paucillary, making 57.5%. However, those with temporary residence saw a 47% incidence rate of multibacillary, apparently higher in proportion than those with permanent residence. There was a low early discovery rate, seeing only at 71.3%; There was a high initial clinic disability and deformity rate, seeing 17.24%; low regular treatment rate for patients with temporary residence, at 79.4% and a high non-track rate at 20.6%. The author maintains that: with the economic development, there is a sharp growth of population in the Special Economic Zone and a year by year increase of flow-in labor, which brings about accordingly notable birth of new incidence of leprosy This is accompanied by augmented possibility of dissemination, as the la-



borers don't have a stable working and living condition. In this regard, we should carry out forceful health education on prevention and treatment of leprosy other than the government's care and support, training the professional team on the prevention and treatment of leprosy, enhance the quality of professionals and foster a strong sense on detecting leprosy to ensure an early discovery, early diagnosis and early treatment. In the meantime, we should take corresponding measures considering the characteristics of leprosy with temporary residence and implement comprehensive management to recuperate the sick physically, mentally and socially.

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### Ep 287

#### ALL THE ELEVEN MEMBERS OF TWO FAMILIES SUFFERED FROM LEPROSY SUCCESSIVELY

Zou Tali \* & Zhang Huanyong #

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A high incidence rate of leprosy among the household contacts of patients with leprosy has been generally recognized. But it was rarely seen that two families of 11 members all contracted leprosy. The authors reported that within the period of 20 years after the occurrence of the first leprosy case in each of two families, all their 9 household contacts suffered from leprosy successively without exception, indicating the significant importance of regular monitoring leprosy household contacts in early case detection, early treatment and interruption of transmission of the disease.

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### Ep 342

#### SURVEY OF NEWLY DIAGNOSED LEPROSY PATIENTS IN JAPAN

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We analyzed the medical and social problems of newly registered leprosy patients in the past 19 years from 1981 to 1999 in a low endemic country, Japan. There were 378 registered Japanese patients (males, 229; females, 149), and 102 registered foreign patients (males, 74; females, 26; sex unknown, 2). The number of Japanese patients in each 5-year period was 187 (81-85), 119 (86-90), 48 (91-95), and 24 (96-99, 4 years), and has been decreasing steadily. But the number of foreign patients in each 5-year period was 7, 10, 45, and 40, respectively, and has been increasing. The number of foreign patients was greater than that of Japanese patients in the latter half 1991-1999. The male/female ratio was 229/149 in Japanese patients, and 74/26 in foreign patients. Male/female ratio has decreased among the Japanese but increased among foreigners.

Newly registered leprosy patients in Japan (upto 1999)

Nationality	Sex	81,82,83,84,85	86,87,88,89,90	91,92,93,94,95	96,97,98,99	Total
Japanese	M	32,14,21,20,25	21,14,17,16,9	6,6,7,2,5	3,2,3,6	229
	F	15,16,13,15,16	13,6,9,8,6	8,3,1,7,3	3,3,2,2	149
M&F		47,30,34,35,41	34,20,26,24,15	14,9,8,9,8	6,5,5,8	378
		81-85:187	86-90:119	91-95:48	96-99:24	
Foreigners	M	0,0,3,0,1	1,2,1,3,1	5,8,9,4,9	12,7,2,6	74
	F	0,1,0,0,2	0,0,0,0,2	2,4,1,2,1	4,2,3,2	26
M&F		0,1,3,0,3	1,2,1,3,3	7,12,10,6,10	18,9,5,8	102
		81-85:7	86-90:10	91-95:45	96-99:40	* Sex unknown

Japanese

81-85:187 86-90:119 91-95:48 96-99:24

Foreigners

81-85:7 86-90:10 91-95:45 96-99:40 \* Sex unknown

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### Ep 370

#### POPULATION SCREENING AND EVALUATION OF PROPHYLACTIC TREATMENT FOR CONTACTS IN LEPROSY HYPERENDEMIC AREAS

Mirjam Bakker, Mohammed Hatta, Paul Klatser & Linda Oskam

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On five small islands in Indonesia (South Sulawesi Province) 3987 persons of a total population of 4770 persons (coverage 84%) were screened for leprosy in June-July 2000.

A total of 91 new leprosy cases were diagnosed, representing an overall case detection rate of 2.3%, ranging

from 1.2% to 5.0% per island. The overall prevalence rate was 191 per 10,000, ranging from 87 to 442 per 10,000 per island. Of all patients, 46% was classified as MB, 40% as PB single lesion and 14% as PB 2-5 lesions. Children below 15 years represented 9% of the patients and those with WHO grade 2 disability 11%.

Of all patients, 68 (75%) were clustered, where clustering is defined as a group of at least two patients who either fall in each other's contact group or share the same contacts. In this study, contacts are defined as household contacts, immediate neighbours and next neighbours. Further analysis of patients and general population data is currently ongoing and will be presented.

On all islands, the leprosy patients were treated with MDT according to the national guidelines. To be able to study two different regimens for prophylactic treatment (blanket treatment and contact treatment) and to have a control group, the three small islands (Pelokan, Kembangemari and Tampaan) were combined and served as one group (1252 inhabitants, 39 leprosy cases). The two bigger islands, Sapuka (2069 inhabitants, 26 leprosy cases) and Sailus (1449 inhabitants, 26 leprosy cases) each served as one group. Sailus served as control island, where only the patients were treated with MDT. On the group of three small islands 79% of the population (persons without leprosy; above 5 years and without contraindication) received prophylactic treatment with rifampicin. On Sapuka contacts of patients (household contacts, immediate neighbours and next neighbours), 17% of the population, received prophylactic treatment. During the delivery of the prophylactic treatment of both groups 73% took the medication direct (under supervision) and 27% indirect. This prophylactic treatment will be repeated after 4 to 5 months.

During screening (intravenous) blood and nasal-swabs were collected of everybody above five years. This (including the screening) will be repeated every year for the coming three years. This will enable us to follow-up the effects of the different regimens for prophylactic treatment on the incidence and transmission of leprosy.

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## Ep 400

### COMPARISON OF OCCURRENCE OF LEPROSY AMONG CONTACTS AND GENERAL POPULATION

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#### Objectives

1. To describe the demographic characteristics of leprosy cases detected from contacts and general population.

2. To study case yield in contacts and non-contacts.

#### Design

Comparative retrospective study. All the contacts who were registered from 1997 to 1999 and general population are taken into account.

#### Settings

All leprosy cases from contacts and general population are taken. Study has taken into account records available with Leprosy Control Unit, Philadelphia Leprosy Hospital, Salur of Andhra Pradesh.

#### Main indicators and outcome measures

Case yield between contacts and general population is compared.

#### Results

1. Case yield from contacts is : 2. Case yield from non contacts is : No. of cases among contacts = 0.57% No. of cases = 0.20%

Total no. of contacts Total population examined

#### Conclusion

Case yield from contacts is approximately three times higher than non-contacts. It validates the need for motivation and careful examination of all contacts and also proves the contacts are at a higher risk of developing disease.

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## CI 01

### KALA-AZAR (PKDL) IN LEPROSY ENDEMIC REGION

**O.Abraham, Dr.N.Appa Rao, Dr.G.Ramakrishna Raju, Dr.T.Prabhakra Rao & Dr.P.Krishnamurthy**

Damien Foundation India Trust, Chennai

Dharbanga district in Bihar, India is known to be endemic for Leprosy and Kala-Azar. Post Kala-Azar Dermal Leishmaniasis (PKDL) is also common in this region. Many people with PKDL present with multiple hypo-pigmented skin patches (flat or raised) resem-



bling leprosy skin lesions. The intensive health education campaign brings out many of these patients to leprosy clinics. Inexperienced staff can register these cases as leprosy. Here we present four cases of PKDL resembling MB leprosy. Careful clinical examination and skin smear examination and eliciting the cardinal signs of leprosy will help in correct diagnosis. Details will be presented.

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## CI 02

### **BORDERLINE LEPROMATOUS LEPROSY WITH MOLLUSCUM CONTAGIOSUM - A CASE REPORT FROM NEPAL**

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A 55 years old male farmer presented with asymptomatic skin lesions over extremities of 5 years duration and multiple small papules over face and trunk of 10 months duration. Initially, 5 years back, patient had single hypo anesthetic skin lesions over left knee for which he took tab dapson 100 mg daily for 3 months, then stopped himself after seeing good response. 1 years back, patient again developed similar lesions over left knee and left forearm along with a few nodules over both earlobes. Then, 10 months back, patient developed multiple small and large papules over central part of face and trunk. General physical examination was within normal limit. The cutaneous examination showed that there were 2 well defined plaques

8.5" x 8" and 1.5" x 1" size over left knee and left forearm respectively. A few shiny nodules were also present over both earlobes. Multiple asymptomatic shiny skin coloured papules with central umbilication were noted over nasolabial folds, cheeks, chin, lips and trunk. A clinical diagnosis of borderline lepromatous leprosy with molluscum contagiosum was made. Slit skin smear from earlobes and lesions showed Bacteriological Index 1+. Histopathology from plaques and umbilicated papule showed features of leprosy and molluscum contagiosum respectively. We are presenting this case because of rare association of leprosy with molluscum contagiosum.

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## CI 72

### **LEPROSY SKIN LESION ON SCALP**

*P.Jayapal, Dr.N.Appa Rao, Dr.T.Prabhakar Rao & Dr.Vijayakumaran* Damien Foundation India Trust, Chennai

Leprosy skin lesions are not generally observed in some parts of the body (axilla, scalp). Are these sites really spared by the disease? A male of 45 years was registered with a skin lesion (patch) on the right cheek extending to the scalp. He developed new lesions and lepra reaction during fourth month of MDT Pauci Bacillary regimen. He was treated with steroids and MDT Multi Bacillary regimen was started. Patient responded well. Leprosy skin lesions can occur in scalp, through unusual.

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## CI 113

### **EWANS SYNDROME IN A LEPROSY PATIENT - A CASE REPORT OF AN UNUSUAL ENCOUNTER**

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A 35 year old female treated Borderline Lepromatous Leprosy patient - RFT after 2 years of MDT - was referred to our Hospital with H/O epistaxis from Lt. Nas-tril associated with foul smelling discharge and Lt. sided headache of 2 months duration. There was Lt. Maxillary Ethmoid and Frontal sinus tenderness, sero-sanguinous discharge from Lt. middle meatus and a mild diffuse ooze of blood from a congested Lt. Little's Area.

Radiological examination of the sinuses showed haziness in the Lt. maxillary ethmoid and frontal sinuses. Haematological investigations revealed marked anaemia, and thromocytopaenia. The patient had clinically and bacteriologically inactive, Hansen's Disease.

Antibiotics, antihistamines and topical nasal decongestants controlled the epistaxis and relieved the sinusitis headache, while simultaneous treatment with oral corticosteroids resulted in an increase of the platelets level to 1,45,000/cu.mm. Anterior Rhinoscopy and Nasal Endoscopy were done but there was no specific bleeding point or local lesion seen. Haemoglobin level improved to 6.8 Gr %. With a provisional diagnosis of Anaemia, ITP and Lt. Pansinusitis (treated) the patient was discharged on tapering dose of steroids and haematinics.

After 3 months the patient came with C/O epistaxis again from Lt. Nostril as well as bleeding from gums.

A thorough haematological workup and evaluation was done at CMC Hospital, Vellore and the patient was diagnosed to have EWANS SYNDROME, i.e. (AIHA + ITP). She has since been treated with high dose steroids, H 1 receptor antagonists and haematinics and advised to undergo Splenectomy.

Lepromatous Leprosy may cause epistaxis due to ulceration of nasal cartilage and even present as the first symptom of the disease. We present this case of a treated leprosy patient with epistaxis unrelated to the disease. Bleeding disorders in leprosy may pose a diagnostic and therapeutic challenge as in this case.

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### CI 158

#### CHILDHOOD LEPROSY IN CHANDIGARH - A CLINICO HISTOPATHOLOGICAL CORRELATION

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**INTRODUCTION :** Clinical features of leprosy may sometimes be confusing in children. Sensory testing is difficult in them and slit skin smears (SSS) are usually negative. Histopathology may be unrewarding in early tuberculoid and indeterminate leprosy and there may be a marked disparity between the clinical and histopathological features.

**OBJECTIVE :** This study was carried out to define the histological spectrum of leprosy in children and to correlate it with the clinical spectrum.

**RESULTS :** From January 1990 to July 1999, we diagnosed 1360 new cases of leprosy. Of these, 61 (4.5%) were children in the age group of 0-14 years. A clinical diagnosis of I was made in 4 (6.6%) children, BT in 48(78.7%), BL in 5(8.2%), LL in 3(4.9%) and pure neuritic in 1(1.6%) child. Clinically there was no child with TT or BB disease. A clinico histopathological correlation could be established in only 36 (59.0%) cases. Positive correlation was found in 2 (50%) cases with I, 28 (58.3%) with BT, 5 (100%) with BL and 1 (33.3%) case with LL leprosy. Three (6.3%) cases clinically diagnosed as BT leprosy were TT on histopathology and 1 (2.1%) case was I. One (33.3%) case of LL was BL and 1(33.3%) was histoid leprosy on histopathology. Non specific features were seen in 19(31.1%) cases - 2(50%) with I, 16 (33.3%) with BT and 1(100%) case of pure neuritic leprosy in which skin biopsy was

taken from the area of sensory loss. Lepra stain was positive for AFB in 7 (11.5%) skin biopsies - 5 with BL and 2 with LL leprosy.

**CONCLUSIONS :** Our findings reiterate that clinical diagnosis still remains the mainstay for the detection of leprosy in children, but in certain situations, histopathology may help.

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### CI 194

#### A PRACTICAL FIELD WORKERS' CLASSIFICATION OF LEPROSY

*Rashmi Sarkar & R.V.Koranne, Chandigarh*

A simplified yet a practical classification of leprosy, keeping existing laboratory facilities in consideration has so far eluded the leprologist all over the world. For the field workers, the primary basis of the classification will have to be clinico-bacteriological. Moreover, many workers including ourselves have observed a considerable disparity between clinical and histological features in the same study-group, more so in macular lesions of leprosy. In a recent study carried out by Koranne et al, as many as 20 out of 50 (40%) patients showed disparity using Ridley-Jopling system of classification. Similarly, Sarkar et al, in another study also found discordance in 12 out of 19 (63.16%) patients having macular lesions. Hence, the need for a simplified classification in field areas as suggested below :

A. Indeterminate leprosy : This term should be retained for ill-defined hypopigmented or erythematous macular lesions heralding the onset of leprosy lesions.

B. Non-lepromatous leprosy : Maculo-anaesthetic and polyneuritic leprosy patients are not uncommon in India and thus should be separately listed as such .

C. Dimorphous leprosy : This term clearly delineates the duality of the morphological features of the borderline group. Authors propose the term borderline should be substituted with dimorphous leprosy.

D. Lepromatous leprosy

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### CI 206

#### A FATAL CASE OF ERYTHEMA NECROTICANS



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A 45-year old male presented with recurrent fever and ulcers over extremities and abdomen since 1 year and bloody diarrhea and vomiting since 1 months.. He had had nodular lesions over face 25 years ago for which he had taken dapsone monotherapy for 1 year. Examination revealed pallor and pedal edema. There were nodules over the ears with collapse of the nasal bridge. Multiple ulcers were seen over forearms, thighs and legs. The ulnar and lateral popliteal nerves were thickened and tender. There was sensory loss over ulnar border of both hands and lower 1/3 of legs and feet with bilateral ulnar clawing. Slit smear examination showed, B I 4+ and MI 0. Skin biopsy was consistent with ENL. Hb was 6.8 G/dl, platelet count 96,000 cells / mm<sup>3</sup> and albumin level 1.2 G/dl. Urine showed 10-12 WBC/hpf. C/S of pus from ulcers, urine and blood grew coagulase negative staphylococci sensitive to vancomycin and gentamicin. HIV test was negative. Stool showed occult blood.

During hospital admission, patient continued to have vomiting and loose motions.

Despite IV fluids, parenteral antibiotics, steroids, anti emetics patient expired after 12 days, the cause of death being septicaemia probably secondary to coagulase negative staphylococci. The past history of high dose clofazimine therapy for 7 months could have contributed to the small bowel dysfunction.

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## CI 258

### AN UNUSUAL CASE OF PRIMARY HISTOID LEPROSY

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Histoid leprosy, a special clinical manifestation of lepromatous leprosy, is characterized by the presence of isolated nodules. The number of nodules seen in the case reported is as many as 1948. This report described its clinical features, bacteriological findings, pathologic changes and response to the treatment.

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## CI 288

### LEPROSY SERVICE TO INMATES OF PRISON

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The Leprosy Mission Hospital, Namdnagari Delhi is conducting regular surveys for the inmates of the prison of all the jails of Tihar since 1995. Out of 37,748 inmates examined since the beginning of the survey 196 new cases were detected. Out of 196 new cases 56 were MB and the deformity rate is 6.63%. In addition to the new cases, 13 leprosy affected persons with various deformities were detected.

The survey clearly indicates that the inmates of prisons should be screened regularly for leprosy in all the prisons of India. This also brought out that the health professionals of the prisons should be given orientation in leprosy.

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## CI 304

### INFECTION CONTROL IN A LEPROSY REFERRAL CENTRE

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Green Pastures Hospital (GPH) is functioning as a leprosy referral centre for the western region of Nepal. It has been serving leprosy patients since 1957 and started providing services for spinal cord injuries and other neurodisabilities in 1997.

The majority of cases are admitted only for ulcer care. Other disabilities such as spinal cord injuries are admitted occasionally with big pressure sores. Two beds are reserved for special care in rare cases such as exfoliative dermatitis and AIDS. As a matter of fact, the hospital as referral centre has to handle infected ulcers and other infectious diseases but also at the same time has to offer surgical procedures which require strict infection control such as reconstructive surgery for leprosy patients and flaps for big ulcers.

Periodically, the guidelines for hospital infection prevention and control have been revised. A recent review has recommended some new changes in the hospital regarding waste disposal. A new low cost incinerator has become a safe access for waste disposal. Universal precaution has been applied in the working situation. Different types of wastes are collected in different coloured bins. Plastic lining is used to collect infected material. Empty bottles of Betadine are used to collect sharps and needles.

Staff handling food, laundry and cleaning services are given orientation about infection control. Stool tests

are taken every 4 months from the kitchen staff. In case of diarrhoea, an immediate stool check up is done. Staff at risk are recommended for hepatitis B vaccinations. A register is maintained to record any accidental needle prick and AZT (Azidothymidine) is always available in Green Pastures Hospital at the senior medical officer's recommendation for HIV post exposure prophylaxis.

We conclude that effective and comprehensive infection control can be achieved in a leprosy referral centre, partly with simple measures and low costs but also requiring interventions on a higher cost level such as vaccinations, post exposure prophylaxis and a well functioning incinerator.

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### CI 340

#### OCCURRENCE OF PLANE XANTHOMA IN LEPROSY

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Active cases of leprosy is one of rare diseases in recent South Korea. Plane xanthoma is also another rare condition of the skin, which characteristically involves eyelids, neck, trunk and shoulders as macular or patchy lesions and may be associated with myeloma, monoclonal gammopathy, lymphoma and leukemia.

For the past two decades, authors have seen two cases of plane xanthomas among the 13 cases of multibacillary leprosy patients. One case was a man in his forties and the other a woman in her fifties. The xanthomas developed during the course of the treatment of the active leprosy lesions. In the latter case the xanthomas, except for the eyelids lesions, resolved when the treatment of the leprosy completed. Both of the two patients did not show high elevation of the blood cholesterol or triglycerides. Considering the rarity of the two diseases and the key roles of histiocytes in both conditions, the occurrence of plane xanthomas in multibacillary leprosy patients may have a causal relation rather than coincidental development.

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### CI 350

#### OCCURRENCE OF LATE LEPROSY REACTION IN LEPROSY PATIENTS : SUBSIDES FOR IMPLEMENTATION OF A SPECIFIC CARE PROGRAMME

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Leprosy would be an ordinary disease; however, it is not due to its reactive episodes with risk of disability maintaining the stigma related to the leprosy. These reactions and the potential loss of the neural function may happen before, during and after treatment, through a multidrug therapy (MDT). Release from treatment results from the large number of doses and regularity of their intake necessary for the patient leaves the coefficients of prevalence.

The aim of this study was to evaluate the magnitude of late reactions and the operational subjects referring to the attendance quality. Charts of the 149 patients that received discharge for leprosy from 1994 to 1999, from CSE Jaragua - UFU, were revised using the Record of Inquiry of Alterations. After Cure of the Ministry of Health, 34 (23%) of these patients presented late reaction, 11.76% were paucibacillary (PB) and 88.23% were multibacillary (MB). An average of 3 reactive episodes for borderline patient and 4 episodes for lepromatous patient occurred. One hundred percent of PB patients presented reversal reaction (RR). While among MB 50% presented RR, 40% erythema nodosum leprosum (ENL), 7% isolated neuritis and 3% mixed reaction. In 91% of the cases, the first reactive episode happened in the first year after treatment. There was a positive correlation among mean of BI at diagnosis and the number of reactional episodes during treatment and after release. 97% of patients with late reaction used prednisone and 32% thalidomide, meaning 22% and 8% from the total, respectively. Grade of disability 2 and 3 happened in MB patients of the economically active age. It is discussed the need of implementing specific care program for that new group of patients with warranty of treatment, personnel training for simplified monitoring of neuritis and handling of the adverse effects of corticosteroids therapeutics, seeking the prevention of disabilities.

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## CI 351

**ASSOCIATION OF LATERAL AMYOTROPHIC SCLEROSIS AND LEPROSY PERIPHERAL NEUROPATHY - CASE REPORT**

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**Background :** Peripheral neuropathy leading to sequela is the most important complication of leprosy. The radial, ulnar, median, common peroneal and posterior tibial nerves are the most peripheral nerves commonly involved in leprosy. Clinical manifestations of such involvement include anesthesia, paresthesia and paralysis, and the most commonly found disabilities are clawing of the fingers and weakness of pinch, loss of opposition of the thumb, clawing of toes, and foot drop.

**Case report :** A 60-year-old male had a diagnosis of borderline-tuberculoid leprosy in 1993, and was treated with rifampin, dapsone and clofazimine for two years, according to the policy of the Brazilian Ministry of Health at the time. The patient was discharged in 1995, and in 1998 sought medical help complaining of plantar anesthesia and impaired dorsiflexion of his right foot. Lost eversion of the foot was observed. These manifestations were associated to reverse reaction, and it was initiated prednisone 60-80 mg/day during one year without any improvement of his manifestations. Furthermore, atrophy of his right hamstring and tight were noted. Neurological evaluation suggested that the patient had another neuropathy or myopathy associated with the leprosy-related neuropathy. Electroneuromyography revealed: 1) sequela of chronic asymmetric sensitive-motor neuropathy of mild to moderate severity; 2) diffuse preganglionic lesion on the lower limbs, mostly on the right one. A diagnosis of lateral amyotrophic sclerosis was suspected.

**Discussion :** Reverse reactions are reported to occur up to five years after discharge in 30 percent of the patients with leprosy treated with multidrug therapy. These patients usually improve substantially when treated with corticosteroids for three to six months. In the case reported here the absence of improvement under corticosteroid therapy and the presence of atrophy of muscles usually not involved in leprosy suggested another diagnosis, which was confirmed by the electroneuromyography. Neurological involvement in patients with leprosy is not always leprosy-related; differential diagnoses should be investigated, particularly in patients with unusual manifestations and who do not respond to corticosteroids therapy.

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## CI 353

**APLASTIC ANEMIA AND MULTI DRUG THERAPY IN A PATIENT WITH LEPROMATOUS LEPROSY : REPORT OF A CASE STUDY**

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**Background :** Multidrug therapy (MDT) with rifampin, dapsone and clofazimine has had a major impact for the treatment of leprosy. Several adverse effects have been associated with MDT, including hematological toxicity characterized by hemolytic anemia, agranulocytosis, and thrombocytopenia. Aplastic anemia has been rarely associated with the use of dapsone, but not with rifampin and clofazimine.

**Case report :** A 23- year-old male was seen by a physician in a health center presenting diffuse infiltration, nodules and papules on the face, including the earlobes, upper and lower limbs, and partial loss of the eyelashes and eyebrows. Countless acid-fast bacilli were seen on slit-skin smear, with a bacterial index of 5.25. Diagnosis of lepromatous leprosy was made and MDT was initiated in September 1999. Before the second monthly dose of rifampin the patient had a blood cell count that showed: hematocrit 31.9%; white blood cell (WBC) count 3700 cells per mm<sup>3</sup> (1% band forms, 48% neutrophils, 39% lymphocytes, 10% monocytes, 2% eosinophils), platelets 272000 per mm<sup>3</sup>. No further blood tests were carried out until June 2000, when he was admitted to the hospital with severe nose bleeding. At the time he had a hematocrit of 8.3% WBC count of 1300 per mm<sup>3</sup> (28% neutrophils), and 5000 platelets per mm<sup>3</sup>. A blood marrow smear revealed hypocellularity of the granulocytic and erythrocytic series, and absence of megakaryocytic cells. Several platelet and packed red cell concentrate transfusions have been required. Bone marrow transplantation has been proposed but has not been carried out because no compatible donors have been found.

**Discussion :** Aplastic anemia is a rare adverse effect of MDT, that has been related to dapsone. Earlier detection of bone marrow toxicity might have occurred by close monitoring of blood cell count during MDT. Whether earlier detection would have changed the outcome of this patient is debatable given that dapsone-related aplastic anemia is a rare effect, and it is unknown if it is dose-dependent or an idiosyncrasy. If the latter is true, early withdrawal of dapsone would have not prevented the occurrence of aplastic anemia.

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### CI 357

#### AUXILIARY CLINICAL LABORATORY-MARKERS IN THE MONITORING OF ERYTHEMA NODOSUM LEPROSUM

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Many of the complications of leprosy are due to leprosy reactions. Erythema nodosum leprosum (ENL) demonstrates the effects of marked immunocomplex formation.

**OBJECTIVES :** 1) To evaluate the frequency of clinical-laboratory alterations in a sample of ENL patients, and 2) to enumerate the laboratory tests that are important for the monitoring of leprosy reactions.

**CASES AND METHODS :** A survey and retrospective analysis of the medical records of patients seen at the Leprosy Outpatient Clinic of the University Hospital, Faculty of Medicine of Ribeirao Preto, were performed. The clinical-laboratory investigation of patients with an ENL type reaction had been recorded in 24 medical records.

**RESULTS :** Of these 24 patients, 50% were males. Among the patients evaluated, 80.9% presented elevation of C-reactive protein. The mucoprotein level was normal in 8 patients and the alpha-acid glycoprotein level was elevated in all of them. Evaluation of hepatic enzymes showed some type of alteration in 58.3% of subjects: gamma-GT was elevated in 47.6%, GPT in 25% and GOT in 20.8%. A reduction in serum albumin levels was observed in

30.76% of patients and a reduction of total protein was observed in 12.5%. Leucocytosis was observed in 50% of the patients and anemia in 62.5%, with 4 patients presenting levels of less than 7.0 mg/dl. Fever was present in 54.2%, arthritis in 33.4%, hepatomegaly in

12.5%, splenomegaly in 8.4%, adenomegaly in 16.7%, and clear signs of neuritis were observed in 16.7%.

**CONCLUSIONS :** Our results confirmed the relevance of multisystemic evaluation, revealing a high percentage of patients with increased serum C-reactive protein levels and suggesting the use of this determination as a parameter for the monitoring of leprosy reaction. The alteration of hepatic enzymes, especially the canalicular ones, should be emphasized, together with the hematologic disorders, which should be investigated in ENL episodes.

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### CI 359

#### LUCIO'S PHENOMENON : REPORT OF BRAZILIAN CASES

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A necrotizing skin lesion associated with diffuse non-nodular leprosy was described by Lucio and Alvarado in 1842. After the histopathological alterations were recognized, this reaction was called Lucio's phenomenon by Latapi and Zamora, in 1948. This is considered to be a type of leprosy reaction associated with necrosis of arterioles, whose endothelium is massively invaded by *M. leprae*. Lucio-Latapi Leprosy and Lucio's phenomenon, which correspond to the level of high susceptibility to the bacillus, are common in Mexico and Central America but infrequent in other parts of the world. In Brazil, despite the prevalence of the disease, few reports of Lucio's phenomenon are available. We report here a clinical description and the evolution of four cases of Lucio's phenomenon observed in our service: four patients (three males and one female) with lepromatous leprosy characterized by a discrete pythematous infiltrative process diffusely involving the face and extensive areas of the tegument, with absence of nodules, associated with coalescent purpuric lesions forming plaques and ulcers covered with necrotic tissue, which ascendingly and progressively spread from the distal to the proximal end of the upper and lower limbs. Histopathology revealed focal necrosis of the epidermis, in the superficial and deep dermis, a mononuclear inflammatory infiltrate rich in foamy histiocytes grouped around skin adnexa, nerve fillets and blood vessels. There was necrosis of sweat glands as well as thrombosis of small arteries with a focal deposit of fibrinoid material on the wall. Large numbers of BAAR bacilli were present, forming globes in the histiocytes and endothelial cells. This set of histopathological alterations is comparable to vasculitis of the Lucio's phenomenon on type in the diffuse non-nodular clinical picture of leprosy.

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### CI 361

#### DIFFUSE LEPROMATOUS LEPROSY (LUCIO'S LEPROSY)



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Lucio's Leprosy is a variety of lepromatous leprosy, called spotted or lazarus, by Ladislao de la Pascua (1844), described with those names by Rafael Lucio and Ignacio Alvarado (1852), and identified by Fernando Latapi in 1936.

**Clinical features :** Skin generalized infiltration, succulent or atrophic, without nodules. Telangiectases on the face and chest, rosacea-like appearance of the face, milia cysts (advanced cases) and livedo of the limbs (early cases). Rinitis, saddle nose. Slow but total eyelashes, eyebrows and down hair alopecia. Without ocular lesions. Panneuritis, impairment of sensation over whole body. Visceral lesions and special kind of lepra reaction : erythema necroticans with Lucio's phenomena, chills, high fever, insomnia...

**Bacteriologically :** Plenty acid fast bacilli not only in nasal mucosa but in any part of the skin.

**Histologically :** Lepromatous infiltrates in small foci around vessels, nerves and appendages. Infiltrates are more dense in deep dermis and hypodermis. During lepra reaction : Epidermal necrosis intraepidermal bullae and ulceration. Vascularitis with thrombosis of small and medium caliber blood vessels, surrounded by polynuclear foci with numerous acid fast bacilli.

**Immunologically :** Lepromin reaction is always negative but 4-6 hours after injection of 0.01 ml lepromin, the Lucio's phenomenon in its first stages is reproduced. VDRL is positive in almost all cases.

**Prognosis :** Lucio's Leprosy represents the maximal expression of immunological depression, and therefore it is the most serious form of the disease.

**Treatment :** Sulfones, rifampicin and clofazimine are as effective in these cases as they are in nodular ones.

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## Ch 36

### A STUDY OF FACTORS INFLUENCING PATIENT COMPLIANCE IN AN URBAN OUTPATIENT LEPROSY CLINIC

**David K. Ramana Babu K, Raj Gopal Reddy & Sujai Suneetha, Lepra India, Hyderabad**

Dhoolpet Leprosy Research Centre is an urban leprosy outpatient clinic, where patients are self drawn or referred by city dermatologists & private practitioners. The clinic has developed into a referral centre for the management of reactions & nerve damage besides regular leprosy diagnosis and treatment services. The city also has 9 other leprosy control units & 5 outpatient treatment centres scattered over the city's radius of about 35 Km.

We present the data on patient compliance at our centre and relate it to variables, like age, classification, clinic distance, occupation and deformity. Patients who completed 6 doses of PB MDT in 9 months and 12 doses of MB MDT in 18 months were considered compliant. Since patients come to the centre from as far as 300 km; we also studied compliance in relation to the operational necessity of giving the patient more than a month's dose of MDT.

231 PB leprosy patients and 136 MB leprosy patients were studied separately and together. Overall, the PB patients were more compliant than MB patients. Tuberculoid patients showed highest compliance. The age group of 15 to 35 was found to be more compliant than the older age group and children. There was no difference in regularity between males & females. Although there was a sharp drop in compliance from patients beyond the city limits it was interesting to note that patients beyond 100 km showed reasonably good degree of regularity.

The results also show that patients who received more than 1 month of MDT had the highest regularity (78% among PB patients and 70.5% among MB patients). The data suggest that literacy and education have a positive influence on patient regularity. Patients with no deformity were found to be less regular than those with grade 1 & 2 deformity.

The above results and possible reasons for compliance and non-compliance of patients and the impact of other leprosy programmes in the city will be discussed.

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## Ch 51

### SINGLE DOSE TREATMENT FOR SINGLE LESION LEPROSY - HISTOPATHOLOGICAL OBSERVATIONS

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Some of the problems encountered with single dose of ROM (ROM-I) therapy in single lesion PB patients as reported so far are : 1) Persistence of existing lesion, 2) Increase in the size of old lesion 3) Appearance of new lesions. Delayed clearance of granuloma may be associated with such clinical problems. However, no histopathological study has been reported, following ROM-I therapy.

We report on histopathological observations on 26 patients with single patch leprosy treated with ROM therapy. All patients underwent pre-treatment, as well as



post-treatment skin biopsy at the end of 12-18 months. Granuloma Index (GI) was studied in H & E sections. GI is the fraction of the dermis in a section occupied by the granuloma. The GI is observed under low power objective and expressed decimally, e.g. 1 indicates the whole of the dermis is occupied by the granuloma, whereas 0.1 indicates that 1/10th is occupied by the granuloma. Histopathological changes were termed as active when there was dermal infiltrate of epithelioid granuloma and the GI was more than 0.1 in the dermal tissue with nerve inflammation. It was termed as resolving when the GI was less than 0.1 and inactive when granuloma was absent and/or lymphocytic infiltrate was approximately < 5%.

GI before and after ROM-I

Granuloma Index No. of cases

Pre-treatment Post-treatment

0.4 4 (20%) 2 (10%)

0.3 5 (25%) 2 (10%)

0.2 5 (25%) Zero

0.1 3 (15%) 1 (5%) < 0.1 3 (15%) Zero

Total 20 5 (25%)

Continued on next page Out of 26 patients, 20 patients had granulomatous infiltrate and 6 patients showed perivascular, periappendageal and perineural lymphocytic infiltrate suggestive of indeterminate leprosy, prior to initiation of therapy. These 20 patients were further studied for resolution of granuloma using the GI scale. At the end of study only 5 patients had granulomatous infiltrate, with total clearance of granuloma in remaining 15 patients, indicating marked improvement following therapy. Out of these 5 patients with granulomatous infiltrate, 2 patients had G.I. of < 0.1, suggestive of resolving granuloma, whereas only 3 patients had active granuloma at the end of the study. Striking resolution of granuloma was observed in patients with high GI.

Histopathologically signs of reaction were observed in one patient in the form of edema and extravasation of RBCs. One patient with indeterminate picture before therapy, showed granulomatous reaction (GI of 0.1) at the end of therapy while the remaining 5 patients with indeterminate histology had reached inactive stage. One patient who developed new lesion showed reduction in GI in old lesion (0.3 to 0.1) but the biopsy from the new patch showed GI of 0.3. None of the patients showed presence of AFB before or after therapy.

The histological improvement in 81% of cases after 18 months following ROM-I therapy can be considered as satisfactory and is comparable to PB-MDT, as reported in the literature. Though histopathological improvement with reduction in granuloma size may take longer time, eventually they all regress irrespective of treatment with PB-MDT or ROM-I.

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## Ch 57

### RARE SITES AND IMMUNE ZONES FOR LEPROSY - WHERE ARE YOU?

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Some of the parts of human anatomy were earlier considered immune or rare for development of leprosy lesions. This, however, no longer holds true.

We present our collection of 12 cases with involvement of unusual sites seen over the last 15 years. The sites involved were hairy scalp, glans penis, penile shaft, scrotum, eyebrows, upper eyelid, tongue and palms. Most of the patients had paucibacillary leprosy with lesions exclusively seen on the above sites. One patient had lepromatous leprosy with lesions over the tongue also.

This paper highlights the occurrence of leprosy lesions over rare sites. It emphasises the importance of entertaining the possibility of leprosy, even in lesions on unusual sites and stresses the need for complete skin examination in all the patients.

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## Ch 80

### DAPSONE SYNDROME : REPORT OF 9 CASES FROM NEPAL

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**INTRODUCTION:** Dapsone/diaminodiphenylsulphone (DDS) syndrome is a rare hypersensitivity reaction of dapsone reported to occur in 0.3%-0.6% of patients receiving this drug. It is characterized by exfoliative dermatitis, fever, lymphadenopathy, hepatitis, hepatosplenomegaly developing within 2 - 6 weeks of starting the drug. The incidence of this reaction was high during the initial period after its introduction for use in leprosy in 1940s. The incidence declined during next 2 decades but more cases are being reported from 1970s onwards. We present our experience of 9 cases of this syndrome seen over a short span of 18 months from March 1998 to September 1999 in a recently started tertiary level teaching medical college (BP Koirala Institute of Health Sciences, Dharan) in Eastern Nepal.



**CLINICAL DATA :** Nine patients (6M, 3F) with age ranging from 12-64 years of DDS syndrome were seen. Eight patients were receiving dapsone as part of MDT for leprosy whereas one patient had bullous pemphigoid. All the patients presented with fever, generalized maculopapular rash evolving into exfoliative dermatitis of 1-4 weeks duration appearing within 2-6 weeks of starting the drug. Rash was accompanied by itching in 5 patients. Clinical features included icterus in 6 patients, pallor (7), generalized lymphadenopathy (8), hepatomegaly (6), splenomegaly (2) and pedal edema in 4 patients each respectively. No mucosal involvement or peripheral cyanosis was seen in any of the patients. One patient had suffered from similar condition twice in the past 2 years. Investigations revealed anemia in 6 patients, leucocytosis (7), eosinophilia (4), raised ESR (9), deranged liver functions in 6 and raised serum creatinine and blood urea in one patient each respectively. Routine urinalysis, stool examination, chest x-ray were normal in all patients. Serum HbsAg was positive in one patient only. All patients except one having mild reaction were treated as inpatients. Four patients developed secondary bacterial infection, 2 of whom went on to develop septicemia. Herpes zoster in 2 and herpes labialis appeared in one patient each respectively. All patients were treated by stopping dapsone and giving IV fluids, antibiotics, antipyretics, antihistamines, emollients, and good nursing care. Oral prednisolone 40-60 mg OD was given to 5/9 patients.

Continued on next page It was tapered in next 4-6 weeks. All patients except one improved completely in 3-6 weeks. One patient having concomitant intestinal obstruction leading to perforation and peritonitis died.

**CONCLUSION :** Dapsone syndrome constituted 0.08% of all new dermatology patients seen over a period of 18 months. It can be easily managed if recognized early by stopping the drug, good nursing care, with/without systemic corticosteroids depending upon severity of the syndrome. Dapsone is increasingly being used for many dermatological conditions besides leprosy. Awareness among physicians of this being the probable cause in any patient developing fever and rash within 6 weeks of starting dapsone is warranted as rarely it can be fatal.

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## CH 129

### MULTICENTRIC FIELD TRIAL IN PB LEPROSY WITH 2-5 LESIONS

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A multicentric double blind controlled clinical trial is done to compare the efficacy of a combination of Rifampicin (600 mg) Ofloxacin (400 mg) and Minocycline (100 mg) administered as a single dose with that of standard six months WHO/MDT/PB Regimen.

The study subjects consisted of 1592 patients with 2-5 lesions. The randomization was done at individual patient basis with some patients getting a single dose of ROM and others with WHO MDT.

Total duration of the study will be 48 months (six months of intake phase, six months of treatment phase and 36 months of post treatment follow-up).

Six different centres are taking part in this study. Four follow-ups were completed so far. The improvement / deterioration observed so far in this trial study without decoding, will be presented in this paper.

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## CH 135

### RESPONSE IN SINGLE LARGE LESION TO SINGLE DOSE THERAPY - A CASE REPORT

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A single dose treatment with Rifampicin (R), Ofloxacin (O) and Minocycline (M) combination (ROM-1) for single skin lesion (SSL) leprosy is being practised and the initial experiences on its efficacy as well as the delayed clinical problems have been published. Such treatment in PB leprosy with 2-5 lesions is also under trial and initial experiences show favourable outcome in terms of clinical regression and relapses within acceptable limits. The question often asked is whether ROM - 1 can be given to a very large single lesion. Will such lesion regress or progress soon after initiation of treatment? There is also an apprehension that relapses / reaction may be encountered in greater frequency in large lesions after ROM - 1 on account of insufficient chemotherapy. Hence we proposed to study patients with large lesions treated with ROM-1 in a series of single lesion cases. We record our minute observations on clinical response after treatment with ROM-1 in a case with a large single skin lesion.

Patient RK, 30 years, male, presented with a hypo-pigmented patch with raised margins, of size 9" X 6", on the left knee with pseudopodial extensions towards the medial and lateral sides of the upper third of the leg. There was no nerve involvement. BI was negative. He



was administered a single dose of ROM on 10th Feb. 2000. Photographs were taken from various angles initially and during the surveillance period to record the progress of the lesion. The dimensions of the lesion were charted out. On subsequent follow-up after 6 months, the borders were found to be flattened and the lesions appeared faint and regressing well. The patient will be periodically observed further.

We conclude that single large lesion treated with ROM-1 regimen also shows regression and the clinical behaviour is similar to the pattern observed in the lesions of smaller size. The other similar cases in the series also continue to show regression and no reactions were encountered during the period of follow-up. It should be noted that these observations are made to answer the questions raised purely from a clinical standpoint to record the response soon after treatment on a short-term basis. Whether the response will be sustained or whether there will be progression after initial regression (as compared to the results in smaller lesions) or whether there will be greater proportion of reaction / relapse, etc. over a long period of time can only be answered in course of time.

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## Ch 286

### A CASE OF HYPERSENSITIVITY REACTION DUE TO BOTH DDS AND B663

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Twenty one days after starting the treatment of WHO/MDT MB regime, the reported case complained of gastrointestinal symptoms, such as vomiting and abdominal pain, and generalized pruritus. After withdrawal of MDT drugs for 7 days by himself, he continued to take MDT drugs. Ten days later, a sudden and serious attack of symptoms and signs of exfoliative dermatitis, such as generalized erythema and vesicles, occurred. The patient was diagnosed as having dermatitis medicamentosa (exfoliative dermatitis form). After withdrawal of MDT drugs and giving emergency treatment with anti-allergic measures, the patient was finally out of danger, and the MDT treatment, exclusive of DDS, was continued. But only about 15 minutes after intake of B663 and RFP, the above described symptoms and signs manifested again, and disappeared spontaneously after withdrawal of anti-leprosy drugs. From then on only oral administration of RFP was continued and there was no side reaction as mentioned above. The clinical evidence revealed that the patient was undoubtedly sensitive to both

DDS and B663, the first case reported in China.

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## Ch 314

### CHANGES IN THE PREVALENCE OF DAPSONE RESISTANT LEPROSY SINCE THE IMPLEMENTATION OF MDT

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Dapsone resistance has been recognized as a problem in leprosy since 1964. Dapsone monotherapy was introduced into Nepal in 1956 and multi-drug therapy (MDT) in 1983. However, MDT coverage only recently exceeded 95%. A mouse footpad laboratory has been established since 1980 and all new previously untreated multibacillary cases and relapses have been screened for dapsone and rifampicin resistance by the MFP culture. Our results from 1987, are as follows :

1987-1991 1992-1995 1996-1998

Primary 3/55 (5.5%) 5/69 (7.2%) 14/69(20%)

Secondary (DDS monotherapy) 11/25 (44%) 10/15 (66%) 0/9 (0%)

Secondary (MDT patients) Nil 0/2 (0%) 0/3 (0%)

Secondary dapsone resistance has almost entirely disappeared as the remaining dapsone monotherapy patients have died or been treated with MDT. Secondary dapsone resistance does not develop in MDT regimens. While 7/21 secondary dapsone resistant strains were resistant at high dose, only a single case (of 22 cases) of primary resistance was at high dose dapsone. No cases of rifampicin resistance (at 10mg/kg) have been found by the MFP method over the study period. The possible reasons for these changes in the rates of dapsone resistance and the implications for MDT treatment will be discussed.

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## Ch 322

### RAPID DIAGNOSIS OF RIFAMPICIN RESISTANCE IN LEPROSY



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The extent and trends in resistance of leprosy to rifampicin are unknown. The major impediment to measuring this important fact is the difficulty in measuring such resistance by the traditional mouse footpad method. The molecular basis of rifampicin resistance in *Mycobacterium leprae* has been known for some time and a new rapid method has been developed and field tested in Nepal. The new method uses polymerase chain reaction (PCR) to amplify a 388 base pair section of the RNA polymerase P chain gene (*rpoB*) and a set of oligonucleotide probes immobilized on a nylon membrane is used to probe for mutations associated with rifampicin resistance. The test combined positive and negative controls and used chemiluminescence for detection.

In initial studies, results were obtained from 9 strains (5 from skin biopsies and 4 from mouse footpad samples). Of these, 6 were found to have rifampicin resistance associated mutations. 5/6 were serine to phenylalanine substitutions and one an apparent double mutation serine to phenylalanine and serine to methionine. All except the double mutation were confirmed by sequence analysis. Resistance genotypes were found in biopsies from two patients with a failure to respond to MDT demonstrated by a failure for the bacterial index to fall. Other resistant strains were isolated from mouse footpad samples: one the primary isolate of a previously untreated LL case and three from strains passaged 5, 13 and 14 times in mice. All four isolates had been shown to be sensitive to 10 mg/kg rifampicin in the mouse footpad assay.

We have extended these observations and present data on a set of more than a dozen *M. leprae* strains genotyped for rifampicin resistance and tested at full (10 mg) and half (5 mg) doses in new mouse footpad cultures. The validation of genotype methods of detecting drug resistance in leprosy is critical for their wider use in monitoring this important problem.

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### Ch 352

#### ADVERSE EFFECTS OF MULTI-DRUG THERAPY IN LEPROSY PATIENTS

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Hansen's disease was considered incurable and along the history, many therapies were experienced to break the bacteria's chain of transmission. Nowadays, it is certain that the progress of the treatment has been reached with the use of multidrug therapy (WHO/MDT), composed by three drugs, dapsone, clofazimine and rifampin, which has enabled the healing to this disease, since it does not cause primary and secondary resistance as the use of isolated drugs did. However, the abolition of Leprosy still has to go through many stages in order to fight the several collateral effects, that has been underestimated, and is a cornerstone to increase the adhesiveness of the patients to the treatment. With the objective of determining the magnitude of MDT adverse effects and its transcendence about patient's adhesiveness to treatment the aiming of this proposition is to conduct protocols for the health basic services network, the promptuary of patients treated with MDT. This study was revised, from January of 1995 to May of 2000, in school's health centre (CSE) - Jaragua - UFU. By means of Records of Inquiry of Adverse Effects occur of MDT. 67 (37.8%) out of the 187 patients analysed were paucibacillary (PB) and 120 (62.2%) multibacillary (MB). Among the 113 side effects evidenced, 80 (70.7%) were caused by dapsone, whose major reactions were gastritis with 18 (22.5%). Other occurrences are hemolytic anemia 15 (18.8%); such rifampin side effects are consequences of medicines as follow: 7 (6.2%) harmful effects; standing out colic was mentioned in 2 (28.6%) cases. Ichthyosis with 18 (69.2%) occurrences was the most expressive side effect related to clofazimine appointed like the drug that cause more adverse effects 26 (20.5%) within the 113. In the 113 conducts adapted for those side effects, 29 (25.7%) were medicine's prescriptions and 28 (24.8%) were changes in the treatment. Among the 17 patients who abandoned the treatment, 5 (29.4%) had some type of side effects related to one of the 3 MDT's drugs, 9 (52.9%) of them were MD, and 8 (47.1%) were PB. This survey discusses the importance in considering the adverse effects of MDT as limitations of the adhesion of the patient to the treatment and consequently the eradication of Hansen's disease as a problem of public health and it enhances the importance of elaboration of a protocol conducts for side effects. The ground work of the health groups, and the possibility of using an alternative chemotherapy are extremely important in order to improve the patient's adhesion to the process of cure of Hansen's disease, which is quite long and very distressing for the patient.

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### Ch 368

#### CHEMOPROPHYLAXIS :A SYSTEMATIC REVIEW OF THE LITERATURE AND META-ANALYSIS

*Smith C.M. on behalf of MILEP2 Study Group*

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**Objective :** To quantify the efficacy of chemoprophylaxis against leprosy based on a systematic review of the literature and meta-analysis of trials.

**Method :** A literature search identified 127 published papers relating to the prevention of leprosy and the use of chemotherapy in leprosy was critically appraised. Sixteen trials were selected and grouped into three categories according to the level of randomisation of the trial groups. The Relative Risk (RR) with 95% confidence intervals was calculated from the raw data using a random effects model. To estimate the cost effectiveness of chemoprophylaxis treatment, a further analysis of the rates of disease in the trial and control groups was done. The numbers needed to be treated (NNT) to prevent one new case of leprosy was then estimated (incidence in non-exposed minus incidence in the exposed equals reduced rate, 1 divided by RR equals NNT)

**Results :** The overall results of the meta-analysis shows that chemoprophylaxis gives 60% protection against leprosy, and when given to close contacts of index cases, this protection increases to as much as 99% in some studies. The numbers needed to treat were found to be low in trials of household contacts and high in community based studies.

**Conclusion :** The evidence shows that chemoprophylaxis against leprosy is a feasible and cost-effective way to reduce the future incidence of leprosy through a targeted approach. The role of chemoprophylaxis needs to be re-examined using newer drugs.

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### Ch 416

#### RELAPSE CASES AMONG THOSE RFT

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**Objective:** To find out details of relapses among those RFT

**Design:** Retrospective study patients returned with relapse during surveillance out of RFT.

**Setting:** The Leprosy Mission Hospital, a large referral centre at Naini, Allahabad, Uttar Pradesh, India.

**Participants:** Records of relapse cases out of surveillance

**Main Outcome Measures:**

Percentage of relapse out of RFT patients.

**Conclusion:** The trends of relapse of ratio over the past 9 years among RFT patients here were evaluated. There was a variation in the percentage of relapse among RFT patients.

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### Oc 279

#### OCULAR COMPLICATIONS IN LEPROSY : AN EPIDEMIOLOGICAL STUDY OF 219 PATIENTS

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One hundred and thirty cases of the 219 patients surveyed were found to have ocular complications, an overall prevalence rate of 59.36%. The peak prevalence was seen in hospitalized patients (68.87%, 104/151), next in cures after discharge (55.8%, 24/43) and the lowest in newly detected cases (8%, 2/25). Visual disability rate in the study group is 21.6% including 12.33% blind sufferers. The main causes leading to visual impairments are lids involvement (lagophthalmos, ectropion) accounted for 24.66%, iris impairments 11.4%, corneal diseases 8.6%, and panophthalmitis 5.94%. Adapting measures, such as surgical correction, self-care, functional exercise and topical medication, visual acuity of 85 cases (65%) could be improved or kept unchanged.

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### Ne 99

#### ULTRASTRUCTURAL NEURAL-PATHOLOGY IN LEPROMATOUS LEPROSY

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Involvement of the peripheral nerves is a basic pathological phenomenon observed in leprosy whose manifestation are seen right from the early stage with hypo-anesthetic and hypo-pigmented patches to the advanced forms of the disease with multiple deformities. In the present investigation we have studied the Schwann cell and endothelial cells of endo-neural blood vessels.



Nerve biopsies from four lepromatous leprosy patients were studied by light and electron-microscopy. The patients (BI=6+, Ridley scale) were on treatment with W.H.O. multidrug therapy for 6 month to 1 year. Ultra-structural examination showed that un-myelinated Schwann cell containing many intact bacilli with Electron Transparent Zone. Many of the blood vessels encountered on electron microscopy confirmed the light microscopic observations of intact bacilli in endothelial cells of endo-neural blood vessels. At the point of thinning the endothelial cells appeared rupturing and discharging their contents into lumen of the vessels. M.leprae were seen floating free in the plasma. The Schwann cells of myelinated aron were not affected in our series and M.leprae were not observed. Our observations suggest that the Schwann cells of non-myelinated fibres probably have a greater affinity for M.leprae than myelinated fibres. Whether those two types of Schwann cells are metabolically different, is to be seen.

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### Ne 109

#### PERIPHERAL NERVE SURGERY IN LEPROSY

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Leprosy is mainly disease of nerves. The skin involvement is with all probability, secondary to the neural damage at the dermal level. The involvement of peripheral nerve trunks leads to sensory-motor deficits in the limbs.

These deficits clinically manifest as (i) deformities resulting from adaptive postures consequent to muscle palsies and (ii) wounds and ulcers due to anaesthesia. Leprosy is feared for its deformities and ulcers which are also the cause of social ostracism and stigma associated with the disease.

The neural damage is multifactorial, inflammatory neuropathy is initiated by the bacillus to which compression neuropathy is also added when the nerve swelling reaches a threshold and can no longer be accommodated in the osseofascial tunnels through which the nerve trunks have to pass in their course. In the process, the nerve trunk is damaged.

Peripheral nerve surgery has a lot to contribute to the welfare of a leprosy patient. First and foremost it can help relieve the compression of the nerve trunks and gives good results if steroid therapy is supplemented with. Thus, it has a role in preventing the onset of deformities. Further, if the nerve damage has become established, protective sensations can be restored in some patients by simple nerve trunk decompression because nerve fibres retain the capacity to regenerate

even in badly damaged nerves.

Attempts have been made to restore nerve functions by nerve grafting procedures using both (i) autologous and homologous nerve grafts and also (ii) muscle bridge grafts of various types. Sensory nerve transfers have been attempted too in certain situations to restore protective sensations.

The above concepts will be discussed in some detail along with their merits and demerits and some likely future approaches will be outlined.

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### Ne 164

#### INCIDENCE OF NEURITIS IN A RURAL LEPROSY PROJECT OF ORISSA WITH AN INTEGRATED POD PROGRAMME

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A leprosy project was established in a tribal area of Orissa state covering a population of 550 thousands. Routine SET activities were started to detect all the possible cases in the project area through surveys. Additionally prevention of deformity programmes (POD) were initiated as an integral part of the leprosy services. The methodology adopted in this component was, examination of patients in a systematic method of nerve function assessment.

All the patients are initially stratified into 6 risk grades depending on their possible risk of developing deformity. 36 patients were excluded as not having any risk of developing deformity among 2003 patients. Rest of the cases were followed up in the POD programme.

Among patients who had nerve function impairment and were treated with standardized steroid therapy and supportive physiotherapy, 8% had shown improvement in nerve function. The patients were further followed up to monitor the nerve function during surveillance period. 4 patients developed new nerve function impairments covering the course of MDT programme.

Nerve function assessment is done for all patients under the programme and they also are educated on self care practices. The programme also includes introducing appropriate instruction in the process of treating neuritis.

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## Ne 218

**ALTERED CHOLINESTERASE LEVELS IN LEPROSY NERVES**

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Cholinesterases are ubiquitous enzymes which play a role in cholinergic transmission, neurogenesis and are implicated in neurodegeneration and dementia. Vertebrate cholinesterases fall into two categories, Acetylcholinesterase (AChE) and Butyrylcholinesterase (BchE). These two enzymes differ in substrate specificities and inhibition by selective inhibitors. AChE preferentially hydrolyses acetylcholine or acetyl-beta-methyl choline while BchE preferentially hydrolyses butyrylcholine. Work on AChE and BchE in leprosy skin, muscle and serum have been reported. This study assessed cholinesterase levels in nerves from patients with leprosy.

These enzymes were assayed in six normal and 12 leprosy nerves in the presence of their selective inhibitors. The mean BchE level in leprosy nerves was 17.25 U/mg (SD 7.37) and

8.35U/mg (SD 6.21) in the normal nerves. The mean AChE level in leprosy nerves was

21.87 U/mg (SD 6.81) and 16.71 U/mg (SD 5.50) in the normal nerves. AChE was not significantly altered, but BchE activity was significantly elevated in leprosy nerves when compared to normal nerves ( $P>0.05$ ).

The results show that in leprosy patient nerves there is a significant increase in BchE activity and not in AChE as compared to normal nerves. The possible role of these enzymes in leprosy neurodegeneration will be discussed.

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## Ne 290

**TRIPOD TRIAL PREPARATION FOR A CLINICAL TRIAL IN A FIELD SETTING** *Alison M. Anderson*

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The TRIPOD trial is a double blind, placebo controlled, multi-centre trial of the use of Prednisolone in three aspects of leprosy treatment - prophylactic use for the prevention of nerve function impairment, treatment of early sensory nerve function impairment and treatment of longstanding nerve function impairment.

The trials are run in field clinics of six centres spanning two countries, with local paramedical staff taking the primary responsibility for trial patients. In designing a trial to run under these conditions, without compromising safety and scientific standards, several key issues were addressed in the design phase, in the preparation phase and during the trial.

**DESIGN** - The design conforms to acceptable standards in terms of trial size and randomisation. Randomisation and balance of patients between countries and individual centres needed to accommodate the possibility of between country/centre differences and early curtailment.

**MANUFACTURE & DRUG DELIVERY** - Drugs were locally made for the trial, minimising cost of manufacture and cost of importation. Spot checks of the manufacturer were made during the process. QC samples were independently assessed. Drugs were packed in unique numbered packs under strict supervision.

**STANDARDISATION & TRAINING** - Between centre differences were minimised by the use of agreed, simplified, standardised entry, exit and outcome criteria, and measurement techniques. Centres took part in training and reliability testing before the trial started.

**SUPERVISION, SAFETY & CONTROL** - The trial is integrated into the routine clinic programme and run by staff in the clinics. Safety is assured through an hierarchy of clinic and centre managers, backed up by a local trial co-ordinator and in-country directors. A supervision programme ensures that clinics maintain the standards set. A co-ordinating committee remote from the field provides technical backup, reviews outcome data and makes safety checks.

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## Ne 346

**LEPROUS NEUROPATHY : MORPHOLOGICAL STUDY OF BIOPSIED PERIPHERAL NERVES**

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Hansen's disease is an infectious disease presenting itself as neuropathy and skin lesion. *Mycobacterium leprae* is the pathogen of leprosy neuropathy but the mechanism of nerve damage is uncertain. Perineurial thickening and infiltration of *M.leprae* and/or cell are the main pathological characteristics of Hansen's disease on nerve biopsy. Here, we report the morphological study of perineurium in biopsied nerves.



Biopsied peripheral nerves from ten leprosy patients (6 tuberculoid patients and 4 lepromatous patients) were examined from morphological aspect.

Light microscopical examination showed that the perineurium was markedly thickened by infiltrated cells in tuberculoid type and mycobacterium leprae in lepromatous type. Schwann cells markedly decreased in number and nerve fibre disappeared without regeneration in severe cases. In mild cases, subperineurial edema was present. The nerve fibre density was normal or mildly decreased. Ultrastructural examination showed the abnormalities of basal lamina on perineurial cells. The basal lamina of the perineurium completely disappeared in several cases. In mild cases, subperineurial edema was present. The nerve fibre density was normal or mild decreased. Ultrastructural examination showed the abnormalities of basal lamina on perineurial cells. The basal lamina of the perineurial disappeared in several cases and showed splitting even if the perineurial looked like the normal complete structure in light microscopy. Both types of leprosy neuropathy had same changes with regard to abnormality of the basal lamina. There are many

M.leprae Schwann cells in fibroblasts and perineurial cells on the nerve of lepromatous patients, although few M.leprae in the nerve of tuberculoid patients. Previous studies indicated that the pathogenesis of leprosy neuropathy was due to destruction of axon. This study provides that these abnormalities of perineurium are characteristic in both types of leprosy neuropathy. The perineurium acts as a barrier between the interior of the nerve and extraneural fluid environment. The damaged perineurium light lose the normal function and allow tissue-damaging factors to enter the nerve resulting in degenerating nerve fibres.

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### Im 133

#### A STUDY ON THE REPRODUCIBILITY OF TWO SPECIFIC SEROLOGICAL ASSAYS FOR DIAGNOSIS OF LEPROSY

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Diagnosis is the first step in the treatment and control of any disease, both in the individual as well as in the community. Over the years a variety of serological assays have been described for diagnosis of leprosy. Serum antibody competition test based enzyme linked immunosorbent assay (SACT-ELISA) and phenolic glycolipid based enzyme linked immunosorbent assay (PGLELISA) have been reported to be useful and have been studied widely. One of the important characteristics needed for an immunodiagnostic test, is repro-

ducibility of the results. Regarding these two assays there is no such information available in the literature. Therefore, an attempt was made to find out variations (with-in and between the assays) in the results of these two tests. In the present report, the findings, in brief, for same have been described.

The reproducibilities of these two assays were estimated using sera with different levels of anti-Mycobacterium leprae antibodies. From the findings it appears that with-in assay reproducibility of SACT-ELISA is better for sera having low and middle levels of antibodies whereas with PGLELISA it was better with sera having high and low levels of antibodies. Between assay variations were not promising for both the assays. Regarding the percent positivities of both the assays, the PGL ELISA showed better reproducibility than SACT-ELISA. The results would be presented and discussed in details.

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### Im 316

#### SCREENING NEW LEPROSY ANTIGENS FOR POTENTIAL AS LEPROSY SKIN TESTS

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Elimination of leprosy will require new tools to identify trends in leprosy infection in the community. A leprosy-specific skin test could answer the critical question of how MDT programmes impact the transmission of leprosy. Present leprosy skin tests composed of fractions of the leprosy bacillus do not have the requisite specificity to detect leprosy exposure in communities with high levels of tuberculosis. We have demonstrated that levels of the cytokine interferon-gamma (IFN- $\gamma$ ) produced in a simple overnight whole blood culture with leprosy antigens are increased in healthy contacts of leprosy patients. The 35kD antigen (Triccas, 1996), the 45kD antigen (Vega-Lopez, 1998) and a newly expressed M. leprae homologue of the early secreted antigen of TB of 6kD (ESAT-6 ML) were employed in overnight whole blood assays and interferon-gamma was measured in supernatants. Short-term cultures were compared with longer (5-day) culture and with T-cell proliferation in Nepali leprosy patients, leprosy contacts and unexposed subjects. These data indicate the potential of these three relatively leprosy-specific antigens for leprosy skin tests.

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### Im 341

#### IMMUNOLOGICAL CHARACTERIZATION OF VACCINE

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We have developed the method to apply vaccine topically into mice. The immune response induced by vaccine showed differences among various routes of immunization, which were intramuscular injection, intranasal application, or topical application. Any immunization routes could induce strong specific immune response. Vaccine induced high levels of both humoral and cell-mediated immune activity against antigen in any immunization route. A high level of specific CTL response was also observed, and a high level of IFN- and IL-4 production was induced by even skin painting of vaccine. Adjuvant is one of the most important elements in developing an effective vaccine. The use of cationic liposomes may be helpful in this regard, because they are reportedly effective for enhancing immunization. High levels of both specific CTL and DTH by topical application were induced by coadministration of the vaccine with IL-12 expression plasmids and GM-CSF expression plasmids. The topical application of vaccine seems to induce both Th2 and Th1, but predominantly Th2 rather than Th1 cytokine response. These immune responses were well inhibited by intradermal injection of anti-I-A/I-E antibody. Therefore, topical administration of vaccine is one of effective routes because of a less expensive and less cumbersome method, and may be very useful for the prevention of infectious diseases.

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### Im 358

#### PATTERN OF CELLULAR PHENOTYPE IN LEPROSY

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Considering that leprosy may be associated with distinct patterns of immunological response, 51 individuals were investigated: 36 patients subdivided into groups with the lepromatous (N=12), tuberculoid

(N=12) and reactional (N=12) forms and 15 normal controls.

Peripheral blood mononuclear cells from the individuals in the different study groups were separated and submitted to the in vitro lymphoproliferation test for 72 hours using the polyclonal mitogens, phytohemagglutinin (PHA) and concanavalin-A (ConA), and C-reactive protein (CRP), in parallel to the study of the phenotype of the cells in culture. The lymphoproliferative response was measured by thymidine incorporation and the percentages of CD4 and CD8 cells were obtained by flow cytometry.

**Results :** The various groups showed a different lymphoproliferative response to the mitogens. Lymphoproliferation was significantly reduced in the reactional group in the presence of Con-A and in the presence of CRP in combination with PHA or ConA, compared to control. The lepromatous group showed a reduction in the lymphoproliferative response in the presence of ConA alone or combined with CRP, but responded to PHA in a manner similar to that observed in the control and tuberculoid groups. In parallel to these results, there was a reduction in percent CD4 cells in all groups stimulated with PHA. CRP did not change the percentage of CD4 cells in culture in any group, but a tendency to an increase in CD8 cells was observed in the lepromatous patients in the presence of this protein.

**Conclusions :** These results indicate differences in the patterns of lymphoproliferative response between the groups studied, depending on the different stimuli used and possibly resulting from the specificity of the mitogens for determined lymphocyte subpopulations that are functionally predominant. On this basis, we may attribute to the ConA stimulus the induction of proliferation of suppressor lymphocyte subpopulations in peripheral blood from lepromatous patients, which acted by limiting the lymphoproliferative response.

Continued on next page C-reactive protein alone did not induce lymphoproliferation in the groups under study, but reduced the lymphoproliferative response of tuberculoid patients when combined with PHA or ConA, and the response of reactional patients only when combined with PHA. These data suggest the possibility of CRP binding to lymphocytes since the presence of this protein modified the lymphoproliferative response of these groups. If we admit the existence of CRP receptors on the surface of lymphocytes, this condition seems to be different in the polar and reactional forms of leprosy. Together with other factors, CRP may locally or systemically participate in the acute inflammatory response of leprosy reactions, particularly in erythema nodosum of leprosy, and may also be involved in the mechanisms of cytotoxicity occurring in the cell immune response against the bacillus and possibly in the reverse reaction.

In parallel to literature reports, we suggest the possibility of an expressive involvement of CRP in an inter-



action with lymphocytes and bacillary antigens in the pathogenesis of leprosy reactions and in mechanisms of defense against the bacillus in the various clinical forms of the disease. Studies permitting the evaluation of CRP bound to the surface of lymphocytes from leprosy patients and to bacillary antigens in circulating blood, tissues and cells, and of the possible reactions associated with these mechanisms would contribute to the elucidation of these question.

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### Mi 65

#### THE USE OF MYELIN AND AXONAL STAINS TO ASSESS THE EXTENT OF NERVE DAMAGE IN NEURITIS OF LEPROSY

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Histopathological diagnosis of leprosy in skin & nerve biopsies is usually based on H&E stain to study the general morphology and modified Fite Faraco stain to identify *Mycobacterium leprae*. Since neuritis in leprosy precedes nerve damage, it is important also to evaluate the structural integrity of the nerve by using special stains for myelin and axon.

Solochrome cyanine is a myelin stain where intact myelin is stained brilliant blue and Glees Marshland, stains integral axons black. In this study we carried out regular H&E, Fite Faraco and these special stains - Solochrome and Glees on 10 nerves of leprosy patients in reaction (7BT, 3 BL) and were compared to normal nerve.

The results showed extensive demyelination of axons of BT leprosy nerves and relatively less damage in BL leprosy. Normal nerves showed structural integrity of myelin and axons. When the special stains were compared to H&E, the degree of damage of the nerve corresponded to the extent of endoneurial inflammation.

In conclusion Glees & Solochrome stains give a direct & quantifiable evidence of the extent of nerve damage, which is difficult to assess in the regular H&E stain. The use of these special stains in conjunction with regular H&E and Fite stains can help in the individual neuritis patient management, the details of which will be discussed.

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### Mi 125

#### EFFECT OF POLY UNSATURATED FATTY ACIDS IN EDIBLE OILS ON THE GROWTH OF MYCOBACTERIUM LEPRAE IN CBA MICE

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Poly Unsaturated Fatty Acids (PUFA) / Essential Fatty Acids (EFA), supplemented in diet, are reported to mediate immune-suppression. Prostaglandin E2 a metabolite of PUFA also has a suppressive effect on the immune system. *Mycobacterium leprae* is known to scavenge fatty acids and other lipids for cell wall synthesis from the host cell and also to multiply more abundantly in immunologically suppressed hosts. Therefore it was planned to study the effect of PUFA on the multiplication of *M.leprae* within the footpads of normal mice. Coconut oil having a lower PUFA content and groundnut oil with higher PUFA were supplemented in the mice diet. Auto-oxidation of PUFA *in vivo* was inhibited by the addition of antioxidants.

Six groups of 5 CBA mice were used for the study. Group 1 animals were fed with 20% w/w of coconut oil, Group 2 with 20% groundnut oil, Group 3 and Group 4 in addition to coconut oil and groundnut oil were fed with the antioxidants,  $\alpha$ -tocopherol acetate (500 ppm) and selenium (1 ppm) respectively. Group 5 was the control group fed with normal diet and Group 6 the controls for antioxidants. The footpads of the animals were inoculated with  $1 \times 10^4$  bacilli each and one animal in each group was harvested at 6th, 9th, 12th and 15th months.

A significant difference in the peaks of growth phase was observed. Mice fed with high PUFA content and antioxidants peaked by 6th month counting a significant high of  $1.09 \times 10^6$  bacilli/ml whereas low PUFA diet with antioxidant showed a peak at 12<sup>th</sup> month ( $5.45 \times 10^5$  bacilli/ml) indicating a slower growth rate. The observation confirms that PUFA may be utilized for the cell wall synthesis and at the same time its immuno suppressive activity favors the growth of the bacilli. Though it is a significant finding, it needs corroboration with a larger study.

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### Mo 337

#### DETECTION OF DAPSONE RESISTANCE MUTATION OF MYCOBACTERIUM LEPRAE FROM KOREAN LEPROSY PATIENTS

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Though resistance to Dapsone (DDS) was confirmed by foot pad study of mice in 1964, more convenient in vitro method which circumvent the tedious and expensive in vivo test was not available. Recently Kai et al and Williams et al have reported independently that DDS resistant strains of *M. leprae* reveal missense mutations at highly conserved amino acid residues 53 or 55 in the folP1 gene. The missense mutations T53I, P55R, P55L suggests that this sulfone resistance-determining region (SRDR) of folP1 are responsible for the majority of dapsone resistance.

With use of primers which amplify the SRDR, we isolated two variant strains of *M. leprae* from Korean leprosy patients who are suspicious of resistance to dapsone by PCR-SSCP of the folP1 gene. Direct sequencing of the folP1 region of *M. leprae* variants revealed two missense mutations were identified. Two variants strains showed A to G and C to G substitutions at nucleotides 157 and 164, respectively. We screened the sulfone resistance-determining region of DHPS in 50 patients. The frequency of 157 and 164 guanine substitution was 11 (22%) patients and 6 (12%) patients, respectively, in our study population. The mutations at nucleotides 157 and 164 would substitute Thr to Ala at amino acid residue 53 and Pro to Arg at residue 55 of DHPS, respectively.

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### Mo 354

#### DETECTION OF MYCOBACTERIUM LEPRAE BY PCR IN NASAL AND BUCCAL MUCOSAE IN LEPROSY PATIENTS AND HOUSEHOLD CONTACTS

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Leprosy is a disease of wide clinical and immunopathological spectrum, which causative organism, *Mycobacterium leprae* may occur in large amounts in host tissues without causing clinical signs and/or symptoms. The clinical manifestations correlate with distinct immunologic patterns, varying from a strong cell-mediated immunity to *M. leprae* with a predominantly Th 1-type pattern of cytokine production in tuberculoid leprosy, to an absence of specific cellular immune response to *M. leprae* antigens in lepromatous leprosy related to predominance of Th 2-type response and exacerbation of humoral immune response. Currently it is assumed that transmission occurs by the contact of susceptible individuals with untreated multibacillary patients, however it has been discussed the possibility that not only leprosy patients discharge bacillus, since lep-

rosy bacillus were found in the nasal mucosa from household contacts of multibacillary patients. Because the *M. leprae* cannot be cultured in vitro and it is virtually impossible to assess exposure and the onset of the infection, the PCR holds promise as tool to detect sub-clinical infection with enough sensitivity and specificity for the use in epidemiological studies. In the present report the PCR was applied with a pair of primers described by Yonn et al., (1992) for detection of *M. leprae* in nasal and buccal mucosae of patients and its household contacts. The DNA of the specimens of nasal and buccal swabs was extracted using lysis buffer (NaCl 400mM; EDTA pH 8.0, 50mM; Tris-HCl, 25mM) and proteinase K (100mg/ml). The PCR was standardized according methodology proposed by Innis et al., (1990) to amplify a 372bp specific fragment from

*M. leprae* genome. The reaction results were visualized in 1.5% agarose gels stained with ethidium bromide. A family consisting of a 51 year old borderline tuberculoid patient and 5 household contacts was analyzed. Nasal swab specimens of patient and 4 (80%) of his household contacts was PCR positive, while buccal swab specimens was PCR positive on the patient and 1 (20%) of his household contacts. The difference of PCR positivity between nasal and buccal specimens reinforces the idea that the nasal mucosa is the main way of *M. leprae* transmission. The use of molecular biology in the detection of *M. leprae*, as in the genetic characterization of susceptibility will bring new insights for epidemiological research of the disease allowing to discuss the role of the healthy carrier in transmission of *M. leprae* and the early elimination of the infection source.

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### Di 04

#### IS DELAY IN TREATMENT AFTER DIAGNOSIS RELATED TO AN INCREASE IN DEFORMITY?

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**OBJECTIVE :** Over a period of 2 years from 1997 to 1999, many leprosy patients were reported, with impairments, but not at all treated with any anti leprosy drugs, in the district of Sahib Ganj - Bihar. This initiated us to find out the occurrence of impairment for untreated delayed leprosy patients.

**DESIGN :** This is a retrospective cross sectional study, in which 237 patients with impairments were interviewed and assessed for disability with W.H.O. grade



0,1 and 2. Controls were chosen retrospectively who completed treatment, with M.D.T. successfully and there were 128 patients in the control group.

**SETTING :** 40 primary health centres and the subcentre clinics of the districts where patients were reported.

**PARTICIPANTS :** Untreated leprosy patients who attended the centres and the patients who completed M.D.T. treatment successfully.

**MAIN OUTCOME MEASURES :** Percentage of untreated leprosy patients who developed impairment and the percentage of successfully treated patients who developed impairments.

**RESULT :** Occurrence of impairments for untreated delayed patients (5 years) were 89% (N = 237-211) were as 36% (N= 128-46) of patients developed impairment who successfully completed

M.D.T. treatment.

**CONCLUSION :** An increase in the occurrence of impairment for untreated delayed patients (89%) indicate, that the delay in treatment after diagnosis is related to an increase of deformity.

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### Di 100

#### A STUDY OF AETIOLOGICAL FACTORS FOR PLANTAR ULCERS IN A LEPROSY REHABILITATION HOME

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Plantar Ulcers are a major cause of morbidity in leprosy. Foot deformity is a major contributor to the development of plantar ulcers. Leprosy rehabilitation homes usually provide succor to destitute patients, many of whom have foot deformities.

This study analyses the pattern of plantar ulcers in 45 residents in a rehabilitation home and their relationship to etiological factors that bear upon their rehabilitative occupations. The use of MCR footwear with or without prosthesis was found to reduce healing time. Residents with plantar ulcers were either admitted to a hospital unit or managed in their residential home. Hospitalization versus home based rest & care revealed no differences in healing time. The study also highlights the need for occupational therapeutic measures to modify rehabilitative occupations that carry higher risk for repetitive ulceration.

The recommendations for the study are that good self help based home care measures are effective in reduc-

ing healing time of ulcers. Modifications in jobs assigned to rehabilitative home inmates in accordance to the status of their foot are needed.

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### Di 108

#### MULTIDISCIPLINARY APPROACH IS NEEDED FOR TREATING RECURRENT PLANTAR ULCERS IN LEPROSY

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Plantar ulcers in leprosy have a multifactorial aetiology. Plantar anaesthesia, vascular impairment, structural alterations / abnormalities, muscle palsies and repetitive trauma occurring to the foot in the daily routine of living are some of the important factors responsible for recurrent plantar ulceration. Healing of plantar ulcers is not much of a problem with advances in surgical techniques. It is the recurrences which are annoying.

Most of the approaches described in literature deal with one or more factors at a time to heal the ulcers and prevent recurrences. We recommend a comprehensive multipronged strategy for managing these ulcers in a willing patient. The approaches include posterior tibial neurovascular decompression, correction of muscle palsies, a protective footwear and health education about how to look after an anaesthetic foot. Patient co-operation and understanding of the problem is equally important because he is the one who has to look after himself.

The paper highlights the above issues and brings out relative importance of each factor in geneses and recurrence of plantar ulcers in leprosy affected persons.

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### Di 126

#### BIO MECHANICAL PROBLEMS OF THE FOOT IN LEPROSY *Syed Muzaffarullah, Raj Gopal Reddy, Suman Jain & Sujai Suneetha* Lepra India, Hyderabad

All the joints of the foot play an important role in effective heel-toe walking. Malfunction or destruction of certain joints in the foot will affect walking and produce Bio-Mechanical problems. This in turn will cause abnormal movements in other joints leading to their destruction or malfunction.

The anaesthetic foot in leprosy is prone to much bony damage. Abnormal foot function compounded by anesthesia nearly always leads to long term ulcer problems. Biomechanical problems in the anesthetic foot produces localized high pressure points and a tendency for ulceration. This presentation deals with the different bio-mechanical problems encountered in the foot of leprosy patients seen at Dhoolpet Leprosy Research Centre & Blue Peter Research Centre. The biomechanics of the foot were assessed in 91 leprosy patients (Grade 0 - 41, Grade 1 - 27 & Grade 2 - 23) in terms of inversion & eversion at the mid tarsal joint and pronation & supination at the sub talar joint. Biomechanical problems were detected in the foot in 26 out of 91 patients (28%). Inversion of the foot was the most commonly encountered biomechanical change (8 out of 26, i.e. 30%).

Principles of management for the different biomechanical abnormalities and the use of specialized MCR prosthesis to counteract these bio-mechanical abnormalities are discussed. The application of these principles will go a long way in the prevention of plantar ulceration and improve POD activities.

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## Di 162

### PREVENTION OF SECONDARY IMPAIRMENTS AND ITS SEQUEAE DUE TO PERIPHERAL NERVE DAMAGE IN LEPROSY - WHAT CAN OCCUPATIONAL THERAPY DO?

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The paper aims:

- (1) to discuss some of the occupational-therapeutic methods of treatment both physical and psychological used in 3 groups of patients inorder to limit development of the impairments and/or activity limitations (disability) and/or participatory restrictions (handicap),
- (2) to explain how the physical intervention methods including splinting (using non-P.O.P. materials) done in the occupational therapy department for patients with hand impairments (weakness or paralysis ) helped them in preventing secondary impairments and its sequelae,
- (3) to highlight on how the treatment media s like recreational games, music, therapeutic-activities (arts,crafts,etc.) helped the in-patients (with and without deformities) who were staying in the hospital for a short or long duration, in facilitating some of their inter-personal and intra-personal functions or skills,

(4) to describe how patient-education provided to the in-patients through focus group discussions helped them in gaining knowledge about leprosy and its related problems.

The different approaches and measures used will be discussed. Photographs depicting the whole methods, activities and the model of the splints given will be presented.

We hope some of these methods will be found useful for the institution-based outreach services as well as the community-based rehabilitation set-ups.

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## Di 169

### IMPACT OF SELF-CARE PRACTICES AMONG PATIENTS WITH GRADE-II DISABILITY

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The Junagarh leprosy project implemented the POD programme in 1998 and established the self-care practices for disability cases in 1998.

The major prevention of worsening of disabilities (POWD) activities included are demonstration of care of eyes, hands and feet, ulcer management, footwear provision and re-ablement of disabilities. To make the leprosy affected persons understand about disabilities and to adopt life long habits, demonstrations / care centres at PHC level have been established. Periodic monitoring is done at home during follow up assessment by para medical staff.

114 disability cases have been taken for study and observed that the female group understand about self care practices better compared to male group. In case of males, in spite of having better knowledge, the practice was poor. The results of self care practices are encouraging in hands and eyes, but improvement is required in foot care. The methodology and findings of the study are discussed in this presentation.

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## Di 189

### COMMUNITY BASED ULCER CARE



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Plantar ulcer is one of the major complications in leprosy. Institutional care though effective can be of long duration resulting in economic loss and social disruption. A study was done at Karigiri to assess the role of community based ulcer care in patients with WHO Grade 2 disabilities, released from treatment. This included 73 persons with plantar ulcers: 52 simple and 21 complicated ulcers. Patients were given simple dressing material consisting of MSGA solution, dressing gauze and bandages and were taught self care of feet. Those with infected ulcers were treated with a course of antibiotic. Appropriate MCR footwear was provided and those who refused MCR, were encouraged to use any footwear. Family members were also taught care of feet and encouraged to participate in the patient activities. Patients were followed up at home once every month, during which the patient and family members knowledge and ability to do a dressing effectively was assessed and corrected when needed. Follow up on ulcer status was done 6-8 months later. Of the 73 ulcers, 38 (53 %), 8 complicated and 30 simple ulcers had healed. Among various factors that could contribute to the non-healing or delay in healing, younger patients, agricultural laborers, non-involvement of family were significant

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### Di 211

#### INNOVATIVE POD PROGRAMME - IMPLEMENTATION AND RESULTS

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A leprosy control project covering one million population has been in operation since seven years with NLEP guidelines. Prevention of disability programme has been integrated into the SET work since three years. All paramedical workers are given in - service training in POD.

Special physiotherapy care is given to those who require it. The new techniques in Podiatry also have been incorporated. The recovery rate in the nerve impairment is found to be 70%. The methodology, the frequency of follow up, documentation, the results and the improvement which can be made in the programme are discussed.

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### Di 229

#### FACTORS IN PLANTAR ULCER PREVENTION - BASELINE SURVEY AND RECOMMENDATIONS FOR AN INTERVENTION

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Aundipatti Taluk in Tamilnadu, India is endemic for leprosy. Intensive leprosy control programme has been carried out by Arogya Agam a local NGO since 3 decades. The active prevalence of leprosy has been brought down from 20 to below 2 per 10,000 over the last 10 years. However there are 560 cured leprosy patients with grade 1 and 2 disability and many have plantar ulcers. The project now has more time to concentrate on Prevention Of Disability (POD) with emphasis on reduction of the prevalence of plantar ulcers.

A group of 150 leprosy patients with plantar ulcer or who are highly prone to plantar ulcers (high-risk group) have been selected for intense inputs. A baseline study was made to suggest methodologies. The findings so far indicate that knowledge, practice of foot care and family support all play a role in ulcer prevention. This is expected but it is important that leprosy workers believe this in order to implement disability prevention services. Details of recommendations will be presented.

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### Di 239

#### AN ASSESSMENT OF THE EFFECT OF PROTECTIVE FOOTWEAR IN 571 LEPROSY PATIENTS WITH PLANTAR SENSORY LOSS

*BaoXia, Mu Hongjiaang & Ye Fuchang*

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An evaluation of the effectiveness of protective footwear used for 3 years to prevent plantar fissure and ulcers in 571 leprosy patients with plantar sensory loss in 6 leprosy rehabilitation pilot areas in Guizhou Province was made. The results showed that during the period of 3 years, the number of patients with plantar fissure, the number of plantar fissures, the number of patients with plantar ulcer and the number of plantar ulcers decreased by 96.97%, 97.92%,

46.59% and 53.95% respectively. The effect was excellent. It is observed that the protection of protective footwear is quite good in preventing the occurrence of plantar fissures, plantar ulcers and consequent disabilities.

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### Di 276

#### DISABILITIES AMONG NEW CASES DETECTED IN CHINA - 1989 TO 1998

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This study is to analyse disabilities among the new cases detected in last 10 years and attempt to provide with scientific information for making prevention policy. All of individual data of 22437 new cases from the whole country detected 1989-1998 are provided by the leprosy surveillance system, the National Center. Disability rate among new cases 1989 was

46.49% and 32.31% in 1998, respectively. 25.5% got disability grade II in 1989 and

20.23% in 1998. Disability rate in 18 provinces is over 40%. Disability grade I and II among disabled people are 37.86% and 60.64%, respectively, and 1.5% got deformities like loss of eyebrows, facial paralysis, collapsed nose, etc. Disability rate below 15 year group is 24%, 15-65 39.85% and the group over 65 years 53.33%. About 29.85% of disability occurred within 2 years after diagnosis, and 48.82% and 61.17% of disability occurred more than 2 and 5 years after diagnosis, respectively. About 52.9% of disability is related to leprosy reaction, and 46.1% of disabled cases got more than 3 nerves damage. Disability grade II rate among PB cases (28.99%) is higher than MB cases (22.04%). Disability rate among new cases in China is still very high, but has been decreased in last ten years. Disability rate is very different because of delayed diagnosis, leprosy reaction and different type of leprosy, but there is no difference between age and sex. Early case finding, regular treatment using MDT and effective treatment of reaction are effective method of prevention of disability among new detected cases.

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### Di 282

#### EVALUATION OF EFFECTIVENESS OF LEPROSY REHABILITATION PILOT PROJECT FOR THREE YEARS IN FOUR COUNTIES IN YANGZHOU PREFECTURE OF CHINA

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To evaluate the effectiveness of leprosy rehabilitation pilot project for 3 years in order to provide scientific basis for further implementation. A total of 3125 active or cured leprosy cases were selected to carry out early detection and treatment of neuritis, self-care of eyes, hands and feet, application of footwears, treatment of complicated plantar ulcers, and installation of prosthesis. The study was based upon the national uniform protocol. Among 8 cases with neuritis, nerve function was fully recovered for 20 nerves and significantly improved for 2 nerves. The secondary impairment on eyes, hands and feet was improved at different levels.

66.67% of complicated plantar ulcers were cured, among which 19.82% relapsed. The rate of cases with the suitable prosthesis was 83.79%. The leprosy rehabilitation pilot project is effective for preventing occurrence and worsening of disability and has play a positive role to strengthen the life quality of patients. However, there is still some difficulties in extensive implementation, and it should be integrated with socio-economic rehabilitation.

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### Di 297

#### MODIFIED PATELLA TENDON BEARING BRACE FOR THE NEUROPATHIC FOOT IN LEPROSY

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Green Pastures Hospital in Pokhara Nepal, has been functioning as a tertiary referral center for clinical rehabilitation of people affected by leprosy for over 20 years. Locally available resources have been used to produce orthopaedic devices needed for the management of leprosy complications. The care of neuropathic limbs has always been an area of special interest of the hospital's care team.

Warren suggested a complete immobilization of the neuropathic foot in a plaster of Paris for a prolonged period until bone healing is achieved. Metha et al described a procedure for the immobilization through an orthotic walker. Ankle Foot Orthosis were described earlier as well by Marzano. However, in Green Pas-



tures, we have designed a modified Patella Tendon Bearing (PTB) Brace which is bivalved and gives total contact in order to distribute the weight more evenly and also using the patella, medial condyle and posterior side for weight bearing. This results in a complete weight relief for the neuropathic foot. The production of the device is relatively simple and the cost is low since local material is used.

A posterior and anterior plate are made from High-Density-Polyethylene (HDPE) pipe (commercially available drainage pipe) and heat moulded into a plaster cast. High density foam rubber covers part of the plates to give adequate comfort and total contact. Leather belts connect the anterior and posterior plates and a rocker is fixed on the plantar side to allow heel to toe gait.

The resultant PTB brace is rigid but lightweight. It gives adequate stability and immobilization for both the period of hospitalization, early mobilization and a prolonged period of weight relief. It can easily be removed and adjusted if needed. Pressure sores from the brace have not been seen. The cost of materials in our setting is approximately 920,- NRS (13\$).

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### Di 301

#### PLANTAR ULCERS IN LEPROSY : PATIENTS' PERCEPTIONS AND TRADITIONAL PRACTICES OF CURE

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Plantar foot ulcers are a major reason for hospital admission among leprosy patients. Self-care of anaesthetic feet is a significant health education challenge for leprosy health care workers, and many patients with anaesthetic feet have recurrent ulcers despite repeated health education. In order for health education to be successful in bringing about a change in behaviour, it needs to take into account the patients own perceptions of how ulcers occur, and traditional practices of healing. One hundred consecutive patients admitted for ulcer care at a major leprosy referral hospital in Nepal, were interviewed using a pre-tested questionnaire. Data collected included patients occupation, age, district of residence, as well as data on their leprosy disease and ulcer history. This study will assist health educators in identifying commonly held beliefs and practices, which may aid or impede foot ulcer care.

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### Di 309

#### SURGICAL MANAGEMENT OF COMPLICATED FOOT ULCERS :A HOSPITAL BASED PILOT STUDY

*Mark Macdonald, Krishna Kandel & Paul Roche*

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Complicated foot ulcers occurring in anaesthetic feet in leprosy patients are a major cause of ongoing morbidity and hospital admission. These lead to loss of income, family disruption and increased risk of further damage.

A prospective pilot study of 44 patients was carried out at a tertiary leprosy referral hospital to review current patterns of management of complicated foot ulcers in leprosy, requiring surgical intervention. The place of radiology, pre and postoperative antibiotics, anaesthetics usage, and wound dressings was correlated with healing time. Results of bacterial flora and antibiotic sensitivity were also recorded. In addition correlation between clinically superficial ulcers (plantar aspect of 1st metatarsal head) and underlying septic arthritis, on positive aspirate culture, was seen.

Discussion of results, trends in management and areas for future study are presented

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### Di 376

#### SURGICAL RECONSTRUCTION OF IRREPAIRABLE ULNAR NERVE PALSY

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Seventy-two patients with irreparable ulnar nerve palsy having undergone lumbrical replacement with 3 different tendon transfer techniques were assessed 16 to 79 months after surgery. Mean age of the patients was 32.2 (9-57). Forty five patients were reconstructed with the flexor digitorum four-tail operation (FDS-4T), 12 with ECRL four-tail operation (ECRL-4T), and 15 with Zancolli's Lasso Procedure (ZLP). The mean paralysis times for each group of operations were 75 months, 33 months, and 43 months, respectively. Of those patients being reconstructed with FDS-4T, had a mean follow-up of 42 months, patients with ECRL group has 43 months and ZLP group had 60 months. Grip strength measurements, improvement rate of active range of motion at the PIP

joints, patients ability to fully open and close their hands, and the sequence of phalangeal flexion were noted along with a subjective questionnaire. Grip strength measurements were expressed as the percentage of the contralateral extremity and the improvement rate of active range of motion was obtained by the comparison of pre- and postoperative values.

Mean grip strength measurements were 68% in the FDS-4T group, 64% in the ECRL-4T group, and 48% in the ZLP group. Claw-hand deformity was totally corrected in 28 patients (59%) in the FDS-4T group, 8 patients (66%) in the ECRL group, and 9 patients (56%) in the ZLP group. Residual flexion contracture at the PIP joint remained in 9 (20%) cases in the FDS-4T group and 4 patients in ECRL-4T group. Swan-neck deformity developed totally in 7 fingers in all groups. Age, sex, mean follow-up did not relate statistically to the functional outcome. However, preop extensor lag, wrist flexion contracture, mean paralysis time, type of operation and type of injury significantly affected the functional outcome.

In conclusion, FDS-4T operation was found to be the most effective technique in not only correcting the claw hand deformity, but also in restoring grip strength, especially in patients with longstanding paralysis, and some degree of flexion contracture at the IP joints. Zancolli's Lasso procedure was also effective in correcting claw hand deformity but the results in patients having at least 30° of extensor lag at the PIP joint were not satisfactory. Lateral band attachment in those cases either with ECRL or FDS was thought to reveal superior results.

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## Di 401

### HEALING OF PLANTAR ULCERS IN THE FIELD CONDITIONS OVER A PERIOD OF ONE YEAR OBSERVATION

**Ravi, Jayaraj & Srinivasan**, The Leprosy Mission, Vizianagaram, Andhra Pradesh

The study is undertaken to know the rate of healing of plantar ulcers in the field areas in Visakhapatnam District. Leprosy patients with plantar ulcers are 881 initially in the district. The patients with ulcers are screened and again examined after one year. The patients are taught Self Care technique in field. Dressing kits are provided monthly and MCR shoes are supplied during this period. Patients continue their routine activities at home.

The patients examined at the end of the year are 757 of which 239 patients showed complete healing of the ul-

cers, giving the healing rate of 31.6%. It is observed in 464 (61.3%) patients that ulcers are static and in 54 (7.1%) became worse. Age, sex, wise data is presented.

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## Di 402

### FUNCTIONAL ADAPTATION IN LEPROSY

**Kamaraj Arulmozhi, B.P.T**, The Leprosy Mission Hospital, Naini, Allahabad, Uttar Pradesh

**Objective** Objective: To improve quality of life of a 60 year old man with gross secondary deformities of leprosy.

**Setting** Setting: The Leprosy Mission Hospital - a large referral center at Naini, Allahabad, Uttar Pradesh, India.

**Brief description** description: A 60 year old man with gross secondary deformities of leprosy was left in The Leprosy Mission Hospital, Naini by some helping hands. He was emaciated, totally uncared, dragging himself to move about with less hope of social integration. Clinically he presented with. 1.Complicated grade 4 ulcers, foul smelling with maggots in bilateral swollen hands and feet. 2.Triple nerve palsy - bilateral 3.Flail right ankle joint (neuropathic). 4.Total absorption of fingers and toes. The treatment plan, as any one would think, is to do amputation and make him prosthesis dependant. But the medical team here felt that this would make him more dependent than help him and tried a different way of management. The poster presentation will tell you THE ROAD TO HOME for Raghubansh..

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## Di 413

### P.O.D. KIT TO TRAIN LEPROSY AFFECTED PERSONS IN SELF CARE METHODS

**Dr.Nuthakki Brahmachary S.R**, Ongole, Andhra Pradesh

Deformities in leprosy can be prevented/corrected/arrested from further deterioration if the leprosy effected persons/their family members/community volunteers are trained in simple self care methods. Thereby the leprosy effected persons can live with their family and practice self care methods by themselves/family members/community volunteers. This also helps in prevention of stigma towards leprosy.



This helps reduction of work load on the field workers and admission in hospitals and also brings down financial burden on the Government as well as other institutions working for leprosy.

For the training of leprosy effected persons/family members/community volunteers, a simple kit is devised by me for use of leprosy effected persons. While I was working as District Leprosy Officer, Chittor, I have tried the kit on 170 disabled patients in G.L.C. Unit, Puttur which has yielded very good results.

Hence I feel, if this type of kit is supplied and training is imparted to field workers, who in turn will train leprosy effected persons/their family members/Community/Volunteers, it will go a long way in prevention and management of deformities in leprosy.

This process will help the leprosy effected persons to prevent and manage the deformities and live with dignity, and self-reliance.

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### Di 418

#### PLAN FOR RECONSTRUCTIVE SURGERY AMONG DISABILITY PATIENTS OF VISAKHAPATNAM DISTRICT

*Sudhakar, Jayaraj & Srinivasan*, Vizianagaram, Andhra Pradesh

The study is undertaken to analyse the leprosy patients requiring re-constructive surgery among the disability patients of Visakhapatnam, coastal district of Andhra Pradesh. There are 2821 patients with disability. It is recorded that the patients grouped for re-constructive surgery is analysed by limb wise, fitness wise and will- ingness wise.

Patients with hand disability (claw fingers) are 937, out of which 248 (25.4%) patients are fit for surgery and the remaining 725 patients (74.6%) are not fit for surgery for various reasons. Patients with foot disability (foot drop) are 329, out of which 117 (35.5%) patients are fit for surgery and the remaining 212 patients (64.5%) are not fit for surgery. Patients with eye disability are 84, of which 16 (19%) are fit for surgery and the remaining patients 68 (81%) are not fit for surgery.

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### Di 419

#### EXPERIENCE OF THE DISABILITY PREVENTION PROGRAMME IN VISAKHAPATNAM DISTRICT

*Beniyamin, Jayaraj & Srinivasan*, Vizianagaram, Andhra Pradesh

The data of the disability patients of Visakhapatnam, coastal district of Andhra Pradesh is collected and analysed taking up various parameters like age, sex, organ-wise and grade-wise involvement. There are 2,864 disability patients in 37,272 total living patients in the district giving 7.68% of disability rate in the district.

Men are 1990 (69.5%) and women are 874 (30.5%). Adults are 2843 (99.3%) and children constitute 21 (0.7%). Grade I are 716 (25%) and Grade II are 2148 (75%). Hand involvement alone is 508 (17.7%), foot alone is 872 (30.5%), eye alone is 25 (0.9%). Two limb involvement (hand, foot and eye) is 106 (3.7%).

Individual deformities are worked out and the care services are planned as per the need.

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### Re 50

#### SOCIAL REHABILITATION OF ADDICTED H.D. CASES THROUGH INSTITUTIONAL AA GROUPS IN LEPROSY INSTITUTIONS

*K. Ganapathy, A. Beine & Sr. Roslin T., SN*, Sivananda Rehabilitation Home, Hyderabad

Six years ago, the first institutional AA-group (self-helping group of Alcoholics Anonymous) was started at Sivananda (Leprosy) Rehabilitation Home, Hyderabad, India.

The decision to support forming such an AA-group among our H.D. cases, suffering as well from Alcoholism, was made after seeing 2-3 rehabilitated H.D. cases dying at relatively young age due to Alcoholism - related diseases.

Forming institutional AA-groups in leprosy institutions was found much easier to achieve than fostering or initiating an AA-group in the society among the general poor sections of the population.

Hence this social aspect of rehabilitation of the poor among H.D. cases is highlighted and support to form such institutional AA-groups is highly recommended for leprosy institutions. It is also found that this type of social work is helpful for POD (prevention of deformities), that it makes addicted H.D. cases earlier fit for reconstructive surgery and it further helps to improve

regularity of attendance in out-door-clinics of leprosy control centres.

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### Re 175

#### **ILEP GUIDELINES FOR SER OF PEOPLE AFFECTED BY LEPROSY - THEIR APPLICATION AND RESULTS IN FIVE LEPROSY PROJECTS OF LEPRO INDIA**

**V.Prabhakara Rao, P.V.Ranganadha Rao, D.Rajesh, Tilak S.Chauhan & D.D.Palande** Secunderabad

The impact of MDT during last two decades has helped in a better understanding of the scope and perspectives of rehabilitation in leprosy.

LEPRO India has started rehabilitation programme since 1997 in 5 of its ongoing leprosy projects. The programme is holistic in nature with a multi disciplinary approach to address the concerns of treatment, POD and POWD. The approach has recognised the importance of assessing the impact of leprosy on the individual and the need for the programme to be responsive to the concerns of the individual, family and community. The spectrum of activities consists of need assessment involving the client, family and community, counselling and educational interventions to address self stigmatisation and stigma, formation of village rehabilitation committees and self help groups as partners in rehabilitation process, training of beneficiaries needing skills, liaison with other agencies for providing assistance and follow up to assess the improvement in the quality of life of beneficiaries and sustainability of the interventions.

ILEP guidelines have been formulated in 1999 for organizing rehabilitation services in leprosy. A retrospective analysis of the SER activities implemented in LEPRO India projects indicates that the programme was largely structured and implemented in conformity with these guidelines. The SER strategy in these projects, the activities taken up, the results, impact assessment to identify changes in the socio economic levels of the beneficiaries and the relevance of the guidelines in further strengthening the SER programme are discussed.

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### Re 261

#### **A STUDY ON SOCIAL ASPECTS OF LEPROSY REHABILITATION**

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Among leprosy patients in Bijie prefecture of Guizhou province, 76.16% developed various kinds of disabilities: mixed disability in 34.83%, psychological and social disability in 14.7%, and physical disability in 16.62%, indicating the magnitude of patients with leprosy in need of rehabilitation, work load and manpower. As for the needs of rehabilitation, economic and comprehensive rehabilitation formed a considerable proportion, accounting for 34.1% and

50.06% respectively. Physical and psychological rehabilitation form a base of leprosy rehabilitation, the final goal of rehabilitation for disabled must be comprehensive rehabilitation. The outcome from the implementation of rehabilitation projects demonstrated that physical and psychological rehabilitation projects had the advantages of less input, quick positive response and good acceptability by leprosy sufferers, and were easy to popularize. Implementation of economic rehabilitation project depended on the patients physical condition, their living environment and local market situation. Even though a relatively large amount of input was needed, the outcome was quite good. Without support from society at home and abroad, comprehensive rehabilitation project was difficult to be carried out.

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### Re 292

#### **EXPERIENCES OF AGRICULTURAL TRAINING IN REHABILITATION OF PEOPLE WITH DISABILITIES IN NEPAL**

**Karen Baxter**, Pokhara, Nepal

##### **Introduction**

Situation of People With Disabilities (PWD) in Nepal

Approximately 90% of the people in the Western Region of Nepal work in subsistence agriculture. It is estimated that 10% of the population have disabilities including people affected by leprosy.

Our aim here on the Rural Development Farm (RDF) on the Green Pastures site is to assist families and communities to enable people to help themselves and fulfill their role as participating members of society and not only to assist the PWDs.

Working in agriculture can often further increase peoples disabilities, so training is in the prevention of disability field as well as in technical training.

##### **Method**

Assessment of PWD s needs by RDF and social



worker staff.

Developing a training curriculum in consultation with OT dept. of Green Pastures Referral Hospital and others [eg. Drug Rehabilitation & Aids Prevention (DRAP)]

Training, with much practical involvement on the part of the trainee, has been modified to continually improve the service and is now for up to a month, is farm and community based, & can include business training too.

Follow-up is done regularly by social workers and RDF staff to individuals, families and groups to continue to assist and improve physical and financial welfare.

Continued on next page Results - self confidence

- forming own self help group, - financial stability
- improved status in community- independence or interdependence - changed attitude/behavior

Discussion: Are we achieving our aims ?

How can we improve the assistance we are already giving ?

Can we join with others in the same area to give and receive our experiences to further enhance our services?

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Establishment and development of Self-help-groups : Self-help-groups are known to be a useful tool when developing any scheme for PWD. These groups may need assistance whilst forming. For example, sensitization and understanding about the needs of PWD, vocational and business training and technology transfer.

Development of micro-finance schemes :

Schemes must then be developed that meet the economic and social objectives whilst also being suitable for the Self-help-groups.

Rationale for credit (loan eligibility criteria) must be developed along with interest rates, and methods of loan processing and monitoring that are appropriate for PWD. Monitoring should allow for indicators to develop such that the scheme evolves with time and experience. Handover of the scheme (to the Self-help-group) must be planned from the start.

Continued on next page Conclusion

Achievements : Have the social and economic objectives been met? Are the scheme and project sustainable? What are the second generation spin-offs?

Longer Term : How can the project be expanded to bring benefits beyond PWD? How can PWD be mainstreamed into Nepali society?

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## Re 298

### THE DEVELOPMENT OF AN APPROPRIATE MICRO-FINANCE SCHEME FOR PEOPLE WITH DISABILITIES IN NEPAL

*James Chinnery & Mukti Sharma, Pokhara, Nepal*

Introduction: Situation of people with disabilities in Nepal : Nepal is amongst the world's lowest income earners. Approximately 90% of Nepalese are subsistence farmers. It is estimated that 10% of the people in the Western Region of Nepal have disabilities. People with disabilities (PWD) may be employed in lower paid and more dangerous jobs, they may be exposed to insecurity or violence at home and in their communities and they are generally less educated with fewer opportunities to learn. PWD will also face many barriers to obtaining credit. Disability tends to lead to poverty and poverty leads to further disability.

Micro-finance alternatives : Various micro-finance schemes exist, such as Revolving Loan Funds and Guarantee-cum-risk Funds. Which are most appropriate for PWD in Nepal?

Method: Formation of goals : Goals must be developed which are specifically related to needs of PWD.

## Re 302

### EXPERIENCES OF MICRO BUSINESS SKILLS TRAINING OF PEOPLE WITH DISABILITIES IN NEPAL

*Megan Grueber & Shrijan Gyanwali, International Nepal Fellowship, Pokhara, Nepal*

Partnership For Rehabilitation (PFR) facilitates suitable income earning opportunities for people with leprosy, and other disabilities. People require vocational skills to enable income earning opportunities, and business skills to sell their product or skill. PFR develops our clients basic business skills by offering formal training on a Micro Business Skills Training Course.

The target group includes any client who has received vocational training and business support from PFR. It is designed to be participatory, practical, and result oriented. We have found this training course to be effective for a number of our clients. Evaluation tools include a training evaluation questionnaire completed by the participants, a business evaluation form that is completed by the social worker during a follow up visit to each client, and general discussion with client and other business owners in the area.

Having used these evaluation tools, the training course has been modified to include more practical exercises rather than lecture style presentation. It has been identified that for some people an extra short course on a specific subject, such as account keeping or marketing, will be beneficial to build on their base knowledge of running a business. Another important part of the training reinforced through evaluation is the necessity of on-site (at the persons business place) follow-up and evaluation.

In conclusion, having evaluated four Micro Business Skills Training Courses, this method of skill training appears to be effective for this target group. In future we recommend that this course includes practical exercises, on-site evaluation and follow-up. Short subject specific courses can be investigated to complement the basic course. Clearly the development of this course is an ongoing process to enable the target group to successfully participate in income generating opportunities.

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### Re 303

#### **SOCIO-ECONOMIC REHABILITATION IN MID-WESTERN REGION OF NEPAL**

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The rehabilitation programme is part of the tuberculosis leprosy project to help the people affected by leprosy with severe disabilities or deformity and handicap in the mid-western Nepal, especially for those with the suffering due to adverse physical, social and economic consequences of their disease.

People affected by leprosy with disability have to face the negative attitudes from the society, even it will have the difficulties for the whole family too, because they need to care for the disabled people with financial, emotional and social support. This support will become a big burden for the family, the disabled people also have less opportunity to get a job or marry in the normal social life as others.

The main aim of the rehabilitation programme is to integrate the clients back to the community and rebuild their own self esteem. For the physical rehabilitation, the programme is very concerned about the prevention of impairment and disability activities in their daily lives, our key workers will train the clients about the prevention management and do the follow-up time to time with the family and the community. The whole programme is offering different assistance for the clients in business creation, integrated education, vocational training and job replacement, living support and housing.

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### Re 362

#### **ISSUES IN THE REHABILITATION OF PEOPLE AFFECTED BY LEPROSY - A CASE STUDY FROM NEPAL**

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For centuries, people in many societies have become socially isolated due to the physical, psychological or social consequences of leprosy. Widespread evidence has shown that the segregation of people affected by leprosy reinforces leprosy stigma and creates negative images of the disease. This has contributed to the increasing provision of rehabilitation facilities to enable debilitated people to return to mainstream society. Recently the policy of Community Based Rehabilitation has successfully resulted in fewer people affected by leprosy becoming socially isolated in the first place. It is also generally accepted that institutional facilities are needed to care for those who are severely disabled and have no external support, particularly the elderly. However, there seems to be little acknowledgement or provision for people who choose to opt out of mainstream society, usually because of their experience of severe leprosy stigma. This study from Nepal examines a range of coping strategies adopted by people affected by leprosy faced by debilitation, whether from choice or necessity. A spectrum is proposed which relates the coping strategy to the degree of social integration. This puts forward an individual's perspective on the issue of social isolation/integration although this is not necessarily the view shared by the leprosy agencies or the World Health Organisation. The study finds that whilst the latter ideally aspire to full social integration of all people affected by leprosy, the goal of a small proportion of individuals may be to remain isolated.

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### Re 403

#### **CHANGE IN SOCIAL AND ECONOMIC ASPECTS OF BENEFICIARIES IN COMMUNITY BASED REHABILITATION PROGRAMME**



**S.Prasad Chowdary, Dr.B.P.Ravi Kumar & Mrs.Ratna Philip** Philadelphia Leprosy Hospital, Salur, Andhra Pradesh

**Objectives:** To find out the changes in social economical and living conditions, pre and post community based rehabilitation programme.

**Design:** Descriptive retrospective study. All the beneficiaries in community based rehabilitation programme from 1991 to 1999 are included in the study.

**Settings:** Community based rehabilitation leprosy patients from urban and rural areas of Leprosy Control Unit of Philadelphia Leprosy Hospital, Salur of A.P. State.

**Participants:** All the beneficiaries of community based rehabilitation programme of Leprosy Control Unit, Salur.

**Main Indicators and outcome measures**

Different percentages have been taken into consideration.

**Results:** The percentage of different categories is high like expansion of unit, change of living conditions and getting income by community based rehabilitation unit. Also the percentage of beneficiaries who are actually benefitted with community based rehabilitation programme is high. The percentage of male beneficiaries improvement in different categories is little higher than female beneficiaries.

Continued on next page 76% beneficiaries expanded their units. Improvement in amenities is 34%, but at the same time, economical improvement and change of living condition is 72%. Beneficiaries getting income through community based rehabilitation are of 81%.

**Conclusion:** There is an improvement of beneficiaries in economical status. Though the percentage of improvement in acquiring amenities is low, the programme of community based rehabilitation has helped the beneficiaries in improving their economical and living condition. So the programme of community based rehabilitation helping leprosy patients to live on their own without depending on anybody. It gives them satisfaction to live happily.

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## Re 405

### HANDA'S ACTIVITIES - A CONCEPT OF HOLISTIC REHABILITATION

**Chen Zhiqiang, Yang Lihe & Ruth C. Winslow,** Guangzhou, China

Leprosy has been a disease not only affecting people on the physical part, but also causing social, economic and psychological problems. Though not many active cases now exist in China, there are about 250,000 people affected by leprosy alive still facing a great difficulty of living due to the stigma and discrimination. HANDA (IDEA CHINA), Hansen-Damien Rehabilitation & Welfare Association dedicates to working together with the community for the social, economic, physical and psychology rehabilitation of the people affected by HD. The following activities have been carrying out in 4 provinces in China.

**Advocacy :**

Bringing dignity and respect to the individual by being an advocate and voice to the government for the people, publishing and distributing materials about the disease and the people, especially that written by the people and representing of the people in international forums where they can share their views with medical professionals.

**Social-Economic Rehabilitation:**

Micro economic empowerment projects is to enable the people to be greater self-supporting and self-confidence, which include fruit trees planting, livestock raising and traditional quilt making, etc.

**Skills Training Programs:**

HANDA organizes and conducts skills training seminars and workshops to empower people with a skill and self-confidence and enable them to find work either in a factory or live independently. Sewing school, leadership empowerment workshop and basic finance management training are some example.

Continued on next page Physical Rehabilitation:

HANDA is striving to meet physical needs and improve the quality of life for the aging and severe impairment population through: Foot Care Project, Eye Project and upgrading the living conditions of leprosy villages.

**Education Scholarship:**

Support children of HD affected persons who do not have access to education as a result of inadequate income or community rejection. Now 198 children from six provinces are under the umbrella of the scholarship.

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## Re 408

### REHABILITATION OF LEPROSY PATIENTS

**Dr.Prasad George Cherian, C.F.C.H.** Centre, Ambilikkai, Dindigul District, Tamil Nadu

Christian Fellowship Community Health Centre, Ambilikkai, Tamilnadu, has its Leprosy Rehabilitation Centre established about quarter of a century ago, way back 1968. Taking care of the ulcers of anaesthetic feet and hands are the most common problems, we have to face in our project area. Of course, poor socio economical status is another obstacle in our way of rehabilitation. The vast majority of the patients are farmers or daily labourers, so care of the cured patients feet and hands are important. Even though we supply a pair of micro cellular rubber chapels to all such patients free or partially free and educate them how to prevent the ulcers of their extremities, they frequently visit our hospital with such problems. Bed rest, good food and clean dressing of ulcers are enough for their rapid healing. The well-to-do literate leprosy patients are also subjected to foot ulcers; their number is much less and recurrence is rare. Now-a-days, the number of patients coming for reconstructive surgery are few for various reasons. All correctable deformities and willing patients are already corrected by surgery. Our main rehabilitation is employment of the ex-patients. We have employed 46 cured leprosy patients in our various institutions like hospital, lathe and welding workshop, agriculture, shoemaking, and in dairy farm, etc. some of them are watchmen, security staff and ward aides.

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## So 79

### GENDER ISSUES IN THE SERVICE DELIVERY TO LEPROSY PATIENTS

*Dr. Annamma S. John, Dr. D. Vijayakumar & Dr. Jerry Joshua* Premananda Memorial Leprosy Hospital, Calcutta

In the context of the recent increased awareness of gender issues, this study was taken up to discover what, if any, were the gender issues in the service delivery to leprosy patients, so that suitable solutions could be worked out.

Hospital and Leprosy Control Unit records of The Leprosy Mission, Calcutta, for 1999 were examined and gender wise statistics for Hospital attendance, new case registration at hospital, and the leprosy control unit, and hospital admissions were noted. 100 patients, 50 male and 50 female, taken randomly from OPD were interviewed and asked questions regarding the time lag before seeking treatment and the reasons for delay if any.

The total number of patients receiving MDT at the hospital was 477, of these 364 (76%) were males, and 113 (24%) females. Likewise taking the total hospital attendance figure of 6672, of which 5424 were males and 1248 females, only 19% were women. The number of women attending the hospital was 23% of the number of men attending the hospital. Significantly,

the new case registration at the leprosy control unit, where the patients are detected and started on treatment at home, showed the following figures - 404 males and 240 females, which are much closer to the expected ratio, of the number of female patients being approximately half the number of male patients. The number of women being admitted for complications of leprosy was also much lower than expected. The average delay in seeking treatment was much greater in the case of females than males. 57 % of male patients consulted a doctor before 6 months while only 27 % females patients did so. The reasons females gave for the delay in seeking medical help and for not being admitted when necessary were also noted.

This as a preliminary report giving us some tangible figures showing that women leprosy patients do have a more difficult time obtaining and continuing with their treatment than men have. So if we are to aim for elimination of leprosy worldwide we will have to think carefully and find some solutions for these women.

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## So 171

### KAP STUDY IN A TRIBAL LEPROSY PROJECT FOR EVALUATION OF IMPACT OF IEC INTERVENTIONS

*P. Nageswara Rao, A. Appalaidu, R. A. Bhuskade & V. Prabhakara Rao* Secunderabad

LEPRA India is running a leprosy project in the tribal districts of Koraput and Malkanagiri in Orissa for the last 8 years. The project covers 1.5 million population in 6096 villages located in very difficult terrain. The tribal people speak 8 tribal dialects.

MDT is implemented since inception of the project and 14000 cases were recorded and treated. IEC activities were implemented by different approaches. A specially equipped IEC van was utilized to screen films and conduct public meetings.

A KAP study was conducted in the project to assess the impact of IEC interventions. A questionnaire was administered to 280 persons, comprising of teachers, leaders and community members selected by random sampling. The responses were analysed.

The findings and the areas needing special emphasis for IEC interventions have been summarized.

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**So 201****COMMUNITY LEPROSY  
ELIMINATION ACTION PROJECT BY  
ROTARY DISTRICT - 3200**

*Dr.N.P.Shanker Narayan, Dr.P.K.Gopal & Dr .Kirubakaran Samuel Raj Sakthi Nagar, Erode District, Tamil Nadu*

Leprosy is still a major problem of the developing countries which find that the physical and social disabilities consequent to the disease are extremely difficult to cope with. The age-old stigma attached to the disease leads to many a broken home and the economic loss to production.

VHS, Leprosy Project, Sakthi Nagar, IDEA-INDIA, Erode, GLRA, Chennai with the help of 103 Rotary Clubs of Rotary International District.-3200 have embarked on an ambitious Project - CLEAR for Leprosy patients.

AIM : A unique Leprosy project for supporting community action in leprosy elimination & to make this a model project so that other RI Districts (worldwide) can implement this project.

There are 3 million disabled leprosy patients all over the world. This programme can be implemented by Rotary Clubs in the sixteen top endemic countries recognized by WHO. Rotary has almost eradicated polio. One of the great achievements of this millennium.

Let us join hands and fight this ancient disease which has caused enormous disabilities and disfiguration.

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**So 224****KNOWLEDGE AND ATTITUDE OF SCHOOL  
CHILDREN TOWARDS LEPROSY**

*Geetha A.Joseph, Udayasuriyan P. Manimozhi N, Raja Samuel Bushanam & Rao P.S.S.S.*

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Leprosy presenting as an anaesthetic, hypo-pigmented patch is not uncommon in the school going age group. Approximately thirty percent of all new cases detected are among the school going age group and sixty percent of these are detected during school surveys. While skin problems in this age group are a major concern for most children and their parents, the medical attention sought is low. Immediate medical attention is given only when the person complains of itching, while other symptoms are given low preference. This

study was done to assess the knowledge of leprosy and attitude of children towards leprosy. 26 schools were randomly selected from Gudiyatham Taluk in Vellore District of Tamil Nadu State to include both rural and urban schools. The Headmaster was asked to select among the senior classes (Std 8-12) 10-20 children to participate in the program. The children were given a questionnaire, adapted from the Mutatkar questionnaire which included 30 questions on knowledge of the disease, attitude towards an affected person and attitude that society should have towards affected persons. The participants were then educated on basic aspects of leprosy and taught to examine for hypo-pigmented patches and suspect leprosy. 1145 children participated, 445 rural and 700 urban. While there were no significant differences between males and females in both groups, knowledge on basics of leprosy were poor among the rural than among their urban peers. However, there were no differences in their attitude towards leprosy.

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**So 260****HEALTH EDUCATION ABOUT LEPROSY IN  
RECENT TEN YEARS**

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Leprosy is as much of a social problem as a chronic disease. For control and eradication of leprosy, the most essential is timely detection of all established cases to the degree possible. And in this respect, health education about leprosy has played a prominent role. Health education programme carried out in Bijie prefecture in recent 10 years indicated that this programme has made contributions in disseminating knowledge about leprosy in the community, supporting patients return to the society and improving early case finding..

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**So 272****A SURVEY OF THE KNOWLEDGE AND  
ATTITUDE ABOUT LEPROSY OF THE  
RESIDENTS IN THE EPIDEMIC AREA**

**Wu Xinsheng, Wang Rongmao, Lin Yong, He Lu, Hu Lufang, Wang Kai, Ren Xiao Hui, Shun Min & Li Binyu**

Sichuan Institute Of Dermatology & Venereology, Sichuan, China

**Objective :** To find out the knowledge and attitude about leprosy of the residents in the epidemic area and try to find the best method of health education on leprosy.

**Methods :** 300 residents are randomly sampled to fill in the questionnaire on-the-spot analysing the data by computer.

**Results :** 292 questionnaires received are valid showing that it is common for the residents to fear leprosy and discriminate against leprosy patients and many factors influencing it.

**Conclusion :** We should carry out the health education on leprosy widely and deeply, centering on that leprosy is preventable and curable, not fearful to let the patients and ex-patients return to the community. This is the main condition and also the major step to eliminate leprosy as a social problem.

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### So 273

#### A SURVEY OF THE KNOWLEDGE AND ATTITUDE ABOUT LEPROSY OF THE RESIDENTS IN THE EPIDEMIC AREA

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**Objective :** To find out the knowledge and attitude about leprosy of the health workers in the epidemic area and the factors influencing on it.

**Methods :** Health workers are surveyed on the spot by questionnaire at country, town and village level, analysing the data by computer.

**Results :** 902 questionnaire received are valid, 292 are control ones, showing that health workers fear leprosy in different level and detest the leprosy patients.

**Conclusion :** Health workers not belonging to the leprosy control have wrong knowledge and attitude on leprosy. It is the major step to train these workers about the knowledge of leprosy, changing the patterns in order to eliminate leprosy.

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### So 321

#### DOES DISCRIMINATION AGAINST WOMEN WITH REGARD TO DURATION OF HOSPITAL ADMISSION, EXIST IN LEPROSY?

**Kancha Shrestha & Rachel Hawksworth** Anandaban Leprosy Hospital, Kathmandu, Nepal

**Objectives :** To establish systematic differences with regard to gender, and age for hospital length of stay, for a variety of admission criteria.

**Design :** A retrospective cross-sectional study, from all in-patient data, at a tertiary referral hospital in Nepal over a six year period. The study analyzed the length of stay by gender, age and admission criteria for each year in the study period. Difficulty in admission and early discharge were seen as possible areas of discrimination based on gender.

**Setting :** Anandaban Leprosy Hospital, Nepal

**Participants :** In-patient data, 1994-1999.

**Main outcome measures :** Median length of stay for admission criteria, yearly and over the study period, in days. Bed occupancy analysis for gender and age.

**Results :** The median length of stay for ulcer healing in male in-patients was 36 days and 37 days for female in-patients, for reaction management for both male and female was 30 days (p value non significant). For re-constructive surgery, male 54 days and for female 65 days (p >0.05)

**Conclusions :** The results fail to show a significant difference based on gender for hospital length of stay for ulcer or reaction management criteria for admission. A small but not statistically significant difference is shown for length of stay for re-constructive surgery and reasons for this are presented.

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### So 332

#### NON-COMPLIANCE WITH THE WHO MULTI-DRUG THERAPY (MDT) AMONG LEPROSY PATIENTS IN CEBU, PHILIPPINES : ITS CAUSE AND IMPLICATIONS ON THE



**LEPROSY CONTROL PROGRAMME***Honrado E.R., Tallo V.L., Balis A.C. & Chan G.P.*

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Background : Non-compliance of patients with prescribed treatment is a barrier to effective health care and has implications in the efficient use of resources. The success and failure of the major leprosy control strategy at present, i.e. the WHO-MDT regimen, depends to a large extent on the efficiency of health care delivery services and patient compliance. The need to do operational research to identify the reasons for non-compliance for improved implementation of the MDT regimen, has been raised by the UNDP/World Bank/WHO/TDR. This study is an answer to that need.

Objective : To investigate non-compliance to the WHO-MDT regimen among leprosy patients in Cebu, Philippines and to relate its possible impact on the leprosy control programme.

Materials/Methods : Study areas: Twenty highly endemic leprosy areas in Cebu.

Study design : A community-based, cohort, descriptive study using a pre-tested structured interview line was piggy-backed into a project investigating the risk factors for the development of leprosy among household contacts in Cebu.

Results : The noncompliance rate of the 233 subjects enrolled in the study was 30%, while that of compliance was 70%. The reasons for non-compliance are categorized into 3 groups :

1) drug-related 2) health care provider-induced 3) patient-induced. The most common one is due to adverse effects (40%) followed by complying with advice of physician (15.7%). Problems of availability and access to drugs have been cited.

Two factors were found to be associated with increased probability for non-compliance, namely source of MDT and being informed of name of their disease. The non-compliance rate among those who did not get their drugs from the health centres (57.1%) was significantly higher ( $p=0.02$ ) than among those who procured their medications from the health centres (27.3%). Those who obtained their MDT supply from sources other than the health centres had 3.6 times higher probability of becoming non-compliant than those whose source of MDT were the health centres (O.R.= 3.6[95% C.I.=1.38 -4.88]).

Continued on next page The non-compliance rate among those who were not informed about the name of their disease was significantly higher than those who were informed of the name of their affliction (44.4% vs 23.6%, respectively,  $p=0.002$ ). The probability that those who were not informed of the name of their disease would become non-complaint was 2.6 times higher than those who knew the name of their condition (O.R. 2.6[95% C.I.=1.06 -12.18]).

Conclusion/Recommendations : Non-compliance with treatment can set the stage up for emergence of drug resistance. Awareness of what causes it provides us with a weapon to prevent it from happening and ensure success of the leprosy control programme. Research studies and control strategies designed to obviate and offset the causes of non-compliance need to be devised.

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**So 360****LUIZ MARINO BECHELLI' LEAGUE FOR THE COMBAT OF LEPROSY : AN EDUCATIONAL PROJECT**

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This presentation describes the creation, organization and execution of an educational project directed at medical students for the teaching of leprosy through extracurricular activities. The League for the Combat of Leprosy has been active for 8 years at the Faculty of Medicine of Ribeirao Preto, USP. Supervised volunteer work is carried out in order to provide the students with a general overview, with activities in the Program of Leprosy Control in the municipality of Ribeirao Preto, Sao Paulo, Brazil.

The activities involve care for leprosy patients and their relatives as well as educational actions directed at the students, health professionals and the population in general. As an educational project linked to the University structure, the League has three basic objectives: patient care, teaching, and promotion of research, thus integrating the University with the other levels of health and community services. The members of the League are stimulated to learn about leprosy both as a social disease and public health problem within the community context at the socio-economic level. Learning involves practical work such as supervised assistance, activities aiming at the prevention of morbidity and disability, and educational and health-promoting actions executed at a District Unit for primary health care. This type of work may contribute to medical training, helping the diffusion of knowledge, and expanding the services provided by the University to the academic-scientific medium and to the community. A first evaluation indicates that this project is feasible and stimulates education in the area of leprosy, having become a reference model that cooperates to Program of Leprosy Control in the Ribeirao Preto region.

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**So 406****HEALTH EDUCATION OF THE R.F.T. CASES DURING FOLLOW-UP****J.Raghavendra Ra**, Vizianagaram, Andhra Pradesh

Health education is an essential tool of community health. The earliest possible detection of relapse is important both to the individual patient and to the leprosy programme. During the follow-up of R.F.T. cases, the following conditions must be checked-up.

1) Skin condition, 2) Flexibility, 3) Strength, 4) Condition of shoes or other protection,

5) Presence or absence of wounds, 6) Complaints.

The R.F.T. cases must be explained about exercises which put the joints through their full range of movement several times a day will prevent contractures. Simple exercises particularly for the hands, take only a minute or two a day will be much more helpful to the patient. They must be educated about care of hands, feet and eyes. The patient should know in particular that the drug alone will not reverse deformity, prevent or cure ulceration or cure anaesthesia. We must make every R.F.T. case as a propagandist so that he can explain how he is free from the disease after taking regular schedule course of treatment under multi-drug therapy.

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**So 407****FINANCIAL REVIEW OF INCOME AND EXPENDITURE (SALARIES)****Ravi S.Gaikwad**, The Leprosy Mission Hospital, Naini, Allahabad, Uttar Pradesh

A study of the economic dynamics of a large referral leprosy hospital was done retrospectively over 9 years.

The center started seeing general (NLP) patients only in 1995 and the change in the dynamics is obvious with significant increase in income and a healthier financial situation. Introduction of ophthalmology in 2000 will make it even better. The ratio of major expenditure heads has been plotted to give an overview of its distribution.

With the decreasing leprosy work and an existing infrastructure it is prudent to commence general work along with the leprosy work. This helps subsidize the leprosy care, without compromising on quality.

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**Me 142****EVALUATION OF IMPACT OF THREE WEEKS TRAINING PROGRAMME IN POD/ POWD ON ENHANCING COMPETENCIES OF FIELD STAFF AND PROGRAMME IMPLEMENTATION****John Peter, M.Sathyanaarayana, P.V.Ranganadha Rao, V.Prabhakara Rao & D.Rajesh** Secunderabad

LEPRA India has been implementing POD/POWD programme as a focussed activity. In-depth three week training programmes exclusively on POD/POWD have been organized with a view to develop the skills of the paramedical staff in three specific areas - standardized methods for sensory testing to identify NFI in the early stages, identification of MFI by VMT, nerve palpation for identification of early neuritis - and provide appropriate treatment interventions and self care practice by affected persons. The POD / POWD programme was implemented in the projects after imparting this training. The strategy of the programme comprises of screening all living cases and assigning risk grades as per guidelines, providing necessary interventions in accordance to the risk grade and frequent follow up to assess the impact of interventions. Specific documentation procedures have been laid down to monitor the progress of each affected person brought under this programme.

In Adilabad Leprosy Project of LEPRA India, three week training programme was conducted and the POD programmes are implemented since last two years. The team of Physiotherapy Consultants of LEPRA India has evaluated the impact of the training programme, the competencies developed by the staff, the implementation and results of the programme.

The findings of this evaluation about training, competencies and results of the programme implementation are discussed in this paper.

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