ABSTRACTS

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FP 001

MONOCLONAL ANTIBODY BASED DOUBLE ANTI BODY SANDWICH ASSAY FOR DETECTION OF ANTIGEN IN SERUM OF LEPROSY PATIENTS.

SHRIFAT ADAVIS, O.K.GIRDHAR AND U.SENGUPTA
Central JALMA Institute for Leprosy, Taqarni, Agra, INDIA.

The present day serodiagnostic tests for leprosy are based on antibody detection against M.leprae specific antigens, M.leprae specific lipid (phenolic glycolipid) and surface antigens of M.leprae.

While the presence of antigen either in body fluids or in tissues may indicate an active state of infection, presence of antibody on the other hand generally appears later during infection and lasts much longer even after the disease is subsided.

Using monoclonal antibodies a double antibody sandwich enzymoimmunoassay was standardised, and the tudy was conducted on different types of patients and their contacts.

Monoclonal antibodies MLO4, ML06 and ML34 which are reactive with 35 KD, 12 KD (proteins) and 40-50 KD (Polysacchride) antigens respectively of M.leprae have been used in the assay. It is observed that the poly saccharide antigen (40-50 KD cross reactive) is degraded slowly compared to the protein ones. The present study indicates that 35 KD and 12 KD based specific assays for M.leprae are important in distinguishing leprosy from tuberculosis infection.

The efficacy of the assay and its use in the serodiagnostic of leprosy will be discussed.

FP 002

A TRIAL TO COMPARE SERODIAGNOSTIC TESTS FOR LEPROSY

Masaaki Abe, V. P. Bliaradwaj, Thomas M. Buchanan, James T. Douglas, Do-II Kim, Monima Natarang, Bencha Petchkliai, G. Hands, Rebecca H. Roseow, Sarasak Sampatavanich, Praseet Sansompadday, Vishern Vithayasai, Wu Qin-Hue and Douglas B. Yeung
International Cooperative Team Sponsored by Sankawa Memorial Foundation, 3-12-12 Nita, Minato-ku, Tokyo 108, Japan

Six kinds of serological tests for leprosy, i.e. fluorescent leprosy antibody absorption test (FLA), enzyme-linked immunoadsorbent assay (ELISA) using synthetic disaccharide-BSA antigen (ND) or synthetic trisaccharide-BSA (MH) or decalced (ED) or sonicated (NTH) phenolic glycolipid-1 of M. leprae and protease hemagglutination inhibition test (PhIT) using NTH were independently carried out at 7 laboratories by using the same set of coded sera which were collected from 6 Asian countries and USA. The sensitivity of FT and PhIT was significantly higher than that of the other tests in 32 sera from paucibacillary leprosy patients. PT and NDH showed significantly lower sensitivity than ED and NTH in 15 sera from multibacillary leprosy patients. Treatment of those patients for 2 years or longer reduced the sensitivity of every ELISA tests and HAT, while that of PT was elevated by the treatment for 6 months to 2 years. The percentages of positive reactions in PT and HAT were significantly higher than those in the other tests with 81 sera from contacts and 135 sera from non-leprosy cases, suggesting that the former two tests are useful for detecting subclinical infection with M. leprae.

FP 003

Serology During the Clinical Course of Treated Leprosy

Futron Lt, Sally Byrd, Sang-Nae Cho, & Robert Gelber, Exellent Institute, San Francisco, CA & Colorado State Univ., Fort Collins, CO, USA.

Serum antibodies to a synthetic version of the M. leprae specific phenolic glycolipid I (ND-O-BSA) & the common mycobacterial antigen lipopolysaccharin (LAM) were assessed in selected patients undergoing outpatient therapy for leprosy in San Francisco from 1981 to 1986. A total of 224 sera obtained sequentially from 90 patients classified clinically as LL (65), BL (12), or BT (49) are included in these analyses. Patients were selected for study either because therapy was initiated in 1981-82 or because they underwent a significant reaction. Antibody titers were considered positive when ELISA optical density values were 0.10, from the mean of a healthy population in a leprosy non-endemic locale, 0.10 for ND-O-BSA & 0.05 for LAM. Antibody to ND-O-BSA was more commonly positive (65 initially falling to 74%) in sera obtained in each of the six initial years of therapy than antibody to LAM (61 to 35%). An analysis of variance of paired determinations revealed that the average antibody to both ND-O-BSA and LAM fell significantly in all 2 forms of leprosy between years 1-2 & 1-3 (P<0.02). Average yearly antibody responses to LAM consistently fell over all yearly intervals up to 4 years, but antibody to ND-O-BSA fell significantly only during the first year of therapy. Neither intervening lepra type 1 or lepra type 2 reactions significantly affected the overall course of antibodies to either moiety over intervals between 1 & 4 years. Additionally, single antibody determinations were made on a further 48 sera where therapy had been on treatment for 6 to 36 years (average 10.5 years) and who were skin smear negative in 6 disparate sites. Significant antibody to ND-O-BSA and LAM was detectable commonly; 19 had antibodies to both moieties; 10 to only ND-O-BSA, 5 to only LAM, while 10 had antibodies to neither. The implications to clinicians of these results will be discussed.

FP 004

Detection of phenolic glycolipid I of Mycobacterium leprae for monitoring the chemotherapy of leprosy.


Phenolic glycolipid I (PGL-I) is a Mycobacterium leprae-specific antigen and has been used widely for the serodiagnosis of leprosy. The presence of PGL-I in sera of untreated lepromatous patients and the absence of the antigen in long-term treated patients have suggested
that PGL-I might be useful for a monitoring tool for the effectiveness of the chemotherapy of leprosy. In this study, a rather simple PGL-I detection tool was developed, and 21 new patients classified as BB, BL, or LL were examined for the presence of PGL-I and its antibodies before and after the chemotherapy was initiated. Among the 21 patients, 19 (90.5%) had detectable PGL-I in their sera or were seronegative to the antigen. Of 14 patients with BI 5+ or higher, 12 (85.7%) were PGL-I positive and 13 (92.3%) were seronegative to PGL-I. However, only 1 (14.3%) of 7 patients with BI 4+ or less were PGL-I positive and 6 (85.7%) were seronegative. When patients with PGL-I in sera were monitored with regular intervals after chemotherapy, PGL-I titer decrease 2-3 months after chemotherapy. The geometric mean titer of PGL-I among 8 patients who had been followed more than 3 months were 54.3 at day 0, 42.3 at week 1, 25.3 at week 2, 17.4 at week 3, 9.1 at week 4, 3.3 at week 8, and 1.0 at week 22, respectively. During the same period, however, there were no appreciable changes in anti-PGL-I antibody levels and bacterial indices. This study thus showed clearly that PGL-I in serum might be the most reliable parameter to monitor early responses of leprosy patients to the chemotherapy.

**AN ENZYME IMMUNOASSAY (EIA) BASED ON ANTIBODIES AGAINST PHENOLIC GLYCOLIPID I IN LEPROSY PATIENTS AND CONTACTS**

C.S. Mohan (1), D. Schwerer (1), H. Berezin (1), D. De Muynick (2), and B. McNeil (3)

(1) Neurological Institute, University of Vienna, Austria; (2) NIO Institute for Experimental Dermatology, Rijswijk, Netherlands; (3) New York State Institute for Basic Research in Mental Retardation, New York, U.S.A.

Since infection with Mycobacterium leprae takes place through dermal and mucosal surfaces, where IgA plays a major role in immunological defense, we characterized anti-PGL-I antibodies of IgA and IgM subclass. Anti-PGL-I IgA and IgM titers correlated with anti-PGL-I IgG titer in leprosy patients. IgG predominating over IgA. Both anti-PGL-I IgA and anti-PGL-I IgG mean levels decrease as early as one week after chemotherapy. The possible fields of applicability of this test are.

**COMPARATIVE STUDIES OF SERUM IgA, IgG, AND IgM AGAINST PHENOLIC GLYCOLIPID I IN LEPROSY PATIENTS AND CONTACTS**

R.W. Chou (1), T.W. Schwerer (1), H. Berezin (1), D. De Muynick (2), and B. McNeil (3)

(1) Leprosy Research Laboratory, Department of Dermatology, Faculty of Medicine, Kyoto University. (2) National Leprosy Hospital, Osaka-shi, Japan. (3) Department of Natural Science, Nara University.

The discovery of M. leprae specific phenolic glycolipid I (PGL-I) and the successful synthesis of antigenic tri-saccharide moiety of PGL-I opened a new horizon to serodiagnosis of leprosy. We have synthesized a new semi-synthetic antigen, NT-P-BSA, useful for serodiagnosis of leprosy by conjugation of synthetic saccharide to BSA via phenyl propionate as the linker arm. Then we sensitized artificial gelatin particles with NT-P-BSA and developed a new diagnostic kit named "MLPA." MLPA can detect mainly IgM class of anti-PGL antibody which plays an important role in humoral immune response against M. leprae infection. This is a feasible future of application of the test.

1. Monitoring of MTX. Through the follow-up study, we found that the antibody level decline by the effective chemotherapy showing the possibility to see the test for monitoring of drug therapy.

2. Prediction of relapse: We experienced a case to show the elevation of antibody level six months prior to the clinical relapse.

3. Detection of high risk group: Preliminary results of contact survey in endemic area proved that about 40% of them are positive in MLPA showing the possibility to detect high risk group in the contacts by this test.

**FREQUENCY AND POLYVARIATION OF HUMAN ANTIBODIES TO PHEN GL-I FROM LEPROSY PATIENTS DEFINED BY ANTI IDIOTYPES**

A. Zuelke (1), M. Hanson (1), F. Williams (1), L. Leigh, D. W. Mudd, K. Isenberg, and K. N. Halman (2)

(1) London School of Hygiene and Tropical Medicine; (2) Bloomsbury Rheumatology Unit, London, and London Hospital Dermatology Dept.

Two human monoclonal antibodies (mAb), IEA and IE3, were produced by fusion of peripheral blood cells from two lepromatous patients with the human myeloma cell line U-I4672, and selected on the basis of binding to M. leprae. Phen GL-I and ssDNA, but not DNA by ELISA. Although binding profiles of these two IgM kappa mAb were similar, only IEA bound to basal keratinocytes of normal human interfollicular epidermis and astrocyte cytoplasm in normal brain tissue. Rabbit anti idiotype produced against these mAb were specific for their respective idiotype, and ID-anti ID binding was inhabitable by both Phen GL-I and ssDNA. The PHA 4 idiotype was detected on IgM and IgG and was elevated more than 300 above the mean control level in 50% BL, 60% BT, 33% TT in 187. highland Papua New Guinean leprosy patients. Skin binding and fluctuating concentrations during ENL reactions suggest a pathologic role for these germ line encoded antibodies, which bind not only mycobacteria but also auto antigens.
A PASSIVE HEMAGGLUTINATION TEST FOR LEPROSY USING A SYNTHETIC HISTOCHEMICAL ANTIGEN

Bundcho Detthatch, K. Khupulsup, S. Hiranras, Faculty of Medicine Ramathihodi Hospital, Bangkok and Mahaphunyothin University, Bangkok, Thailand

There is need for simple, sensitive, specific and reproducible test for serodiagnosis of leprosy. A passive hemagglutination (PHA) for leprosy was developed to meet these requirements. A synthetic disaccharide, conjugated to bovine serum albumin and specific for the phenolic glycolipid of M. leprae, was synthesized as described by Chatterjee, Cho, Brennan and Appel. The antigen was optimally sensitized in 0.1 M acetic buffer pH 4, to sheep erythrocytes (SRE) already preserved with pyruvic aldehyde, tanned and treated with glutaraldehyde. The sensitized SREs were suspended in 0.25 M PBS pH 7.2 containing 0.5% bovine serum albumin, 0.1% sodium azide, lyophilized and used for testing sera from leprosy, tuberculosis and normal control, at 1:4, 1:8, 1:16 and 1:32 serum dilutions. It was found that if the hemagglutination reaction with specimens at ≥ 1:128 are considered positive, the test was positive in 84.2% of cases of multibacillary leprosy, 16.7% of 24 cases of paucibacillary leprosy, 11.8% of 51 cases of tuberculosis and 3.7% of 54 blood donors more sensitive but less specific. The results was similar to that of ELISA test for IgM antibody to the same synthetic antigen. The present PHA is simple, sensitive, but moderately specific. Its simplicity, specificity and sensitivity make it highly suitable for large scale screening of contacts in leprosy endemic areas.

Evaluation of chemotherapy in leprosy by monitoring Mycobacterium leprae specific antibody titres in patients.

Sudhir Sinha, Anne McEntegart, B.K. Girdhar and U. Gopukras, Central JALMA Institute for leprosy, Agra, India.

Although good treatment is available for leprosy, one is often faced with the problems like selecting a suitable drug regimen, prospective evaluation of disease activity, emergence of drug resistance and relapses etc. This study was initiated to observe whether periodical assessment of M. leprae specific antibody titres in patients undergoing treatment would help in solving these problems.

So far 110 LL/LI patients, who were either untreated or undergoing treatment for various time durations, have been subjected to this study. The M. leprae specific antibody titres were measured by applying two methods: An ELISA for antibodies to phenolic glycolipid I and an RIA (serum antibody detection test, SAGT) for antibodies to an epitope on 35 kdal antigens of M. leprae. Correlation between antibody titres, bacteriological indices and durations of treatment were soughted.

The antibody titres tended to decrease with increasing durations of treatment or decreasing IL, but there were large individual variations. Of particular interest was the observation that even after attainment of smear negativity for AFB, some of the patients continued to show high antibody titres. Significance of these observations will be discussed.

EVALUATION OF FLA-APS.T/PGI-ELISA AND THEIR USES IN IMMUNOEPIDEMIOLOGICAL STUDIES ON LEPROSY

K. Boonmee, Li Xingyu, Su Ximing, Li Xiang, Yang Li, Yu Bo, He Xuanying, Wu Weihua and Pu Xue, Institute of Dermatology, Chinese Academy of Medical Sciences, Beijing, China.

We have systematically conducted comparison studies of FLA-APS.T/PGI-ELISA for validity, reliability and practicality in large sample of 204 cases of leprosy, 70 cases of lepromatous leprosy, lower control (from a non-endemic area, 25 cases of leprosy), 425 cases of leprosy household contacts and 253 cases of random population. The results indicated that FLA-APS.T/PGI-ELISA are highly sensitive and specific for detecting antibodies against M. leprae. Their correct rates are all higher than 95%, and the positive predictive value and negative value are all higher than 90% as well. Additionally several agreements were found in leprosy and nonleprosy epidemiological studies:

1. The positive rates increased gradually from FL-LL/LI to FL in leprosy patients in FLA-APS.T/PGI-ELISA. The positive rates in PGI-ELISA are much higher with multibacillary patients than paucibacillary patients.
2. The positive rates detected with FLA-APS.T/PGI-ELISA are identical with those in FL-ELISA either in FL or LL/LL.
3. In FL, the positive rates detected with FLA-APS.T/PGI-ELISA are similar in each district and in concurrence with the general trend of prevalence rates. On these bases the FLA-APS.T/PGI-ELISA tests may be regarded as useful tools in the diagnosis of leprosy, detecting subclinical infection with M. leprae and relevant immunological studies. However, because the PGI-ELISA is simpler, cheaper and easier to use, this may be more practical than FLA-APS.T/PGI-ELISA in future.

On the other hand, it is emphasized that the methodology of dried blood from our labs is very important in achieving leprosy field immunological studies on a large scale. Meanwhile, the authors still hold the two preliminary concepts of "subclinical infection zone" and "diagnosis line".

INDETERMINATE LEPROSY IN A POPULATION SURVEY AND IN THE SUBSEQUENT FOLLOW-UP OF CHILDREN* L.M. BootinII**

Faculty of Medicine, University of São Paulo, São Paulo, Brazil.

The paper discusses various aspects of indeterminate (1) leprosy in the initial survey undertaken in the Burmese BCG trial (60 242 inhabitants), and in the annual examinations of 28 220 children in the trial followed up over periods of six to eight years. Age-specific rates in the initial mass survey are presented. In total 1914 cases were detected (6.2% I, 76% T, 16% LL and 1.8% LT) among the children in the BCG trial. 768 cases were detected: 25% of them had the I form and their proportion (33%) was much higher than in the population survey. Of these 251 cases only 4.2% had a negative or doubtful lepromin reaction. Two-thirds of these 255 cases evolved to the tuberculoid pole in less than one year. No I cases appeared in the trial poppy lation until ten and eleven years after the start of the trial.
It is concluded that whereas a high proportion of indeterminate cases regress spontaneously or evolve towards the T pole, the indeterminate lepromate negative cases are important in the dynamics of the disease, because a proportion of them, if untreated, tend to evolve towards the L form. This stresses the importance of detection and treatment of 1 cases at an early stage in an effective strategy for controlling leprosy.

* The data are reported with WHO approval.
** Formerly Chief LEP Unit, WHO, Geneva, Switzerland.

FP004
A NEW CONCEPT OF STAGING PAUCIBACILLARY LEPROSY AND ITS APPLICATION TO THE ANALYSIS OF POST-TREATMENT RESULTS OF A MDT STUDY IN MALAWI
Gijs Berteloot and Jorg M. Ponnighaus
LEPRA Control and Evaluation Projects, Malawi

Paucibacillary leprosy patients differ not only by age, sex, and classification but also by the degree to which the various lesions have advanced. For the purpose of staging, the latter heterogeneity creates difficulties which have not been sufficiently addressed so far. As one way to overcome these difficulties we have developed a five point staging system for paucibacillary leprosy, essentially the extent of sensory loss in skin lesions, peripheral nerve enlargement and extent of functional loss. This system was used for this staging study, stage-1 patients being those with definite histopathological evidence of leprosy but no anaesthetic skin lesions only and stage-5 patients being those with definite disabilities typical for leprosy neuropathy. When applying this staging to various outcome data in patients recruited into an ongoing MDT study in Malawi, a strong association between outcome after treatment and stage at intake became apparent. This association is particularly marked for the development of disabilities, late T1 reactions, incidence rates and the disappearance of skin lesions. No patients with stage-1 or stage-2 disease at intake developed disabilities, while 4.7% and 18.2% of patients with stage-3 and stage-4 disease respectively had developed disabilities two years after completion of treatment.

Seven filaments with different buckling forces (0.5-50 gms) have been applied to the palm of the right hand and the sole of the right foot of controls and a group of leprosy patients. The results will be presented.

FP006
SITE OF EARLY LESIONS IN LEPROSY.

Dept. of Dermatology, Venereology & Leprosy, SMS Medical College, Jaipur, India.

The mode of transmission of Leprosy is still not clear. In order to find out weather the site of Lesion and its nature could reflect on the pathogenesis of Leprosy, we analysed our clinical material.

209 cases, out of 2000 attending our Leprosy clinic, of Paucibacillary Leprosy were subjected to clinical charting, smear & histopathological examination. It was observed that 161 had solitary lesion, 38 presented with two lesion while only 5 were having three lesion. Histologically 102 cases were of TT, 97 of Indeterminate and 10 of BT. It was interesting to note that in 161 (88.9%) cases lesions were present on uncovered parts of body while only in 13 (6.22%) patients they were on covered areas. In remaining 10 cases (4.7%) lesions were present on both the areas. Site of lesion did not show any co relation with age, sex of patient & duration of illness.

We are of the opinion that if bacilli enters through epidermal route where it is exposed to skin associated lymphoid tissues (SALT), it probably generates sensitization & can end up either in no disease or indeterminate leprosy or tuberculoid spectrum. This observation might strengthen the concept that mode of entry could be a deciding factor in the development of disease spectrum.

FP005
SENSORY EVALUATION IN LEPROSY PATIENTS USING NYLON FILAMENTS

FRANCISCA J. KARATARI F. HURIRIB H.
All Africa Leprosy and Rehabilitation Training Centre, (ALENC), P.O.Box 105, Addis Ababa, Ethiopia.

If early detection of nerve function loss is important for timely medical/surgical intervention to prevent progressive and permanent nerve function loss, then it is mandatory to have a reliable sensory testing instrument. This is very important in leprosy patients where decreased sensory function may precede motor function loss.

Sensory testing using a ballpoint pen is practised in most leprosy control programs. Bell and Tomancik have shown that this is not a reliable testing instrument. Sensory testing instruments that use nylon filaments are available commercially but the cost will be prohibitive for universal acceptance by field workers in most leprosy control programs.

When nylon filaments are available a simple testing instrument can be made from a bicycle spoke or discarded syringes and needles. The authors have used surgical nylon and by attaching different grades of surgical nylon at different lengths to a handle were able to get a range from 0 to 50 gms. It is suggested that when it is only practical to use one filament to use the one that indicates loss of protective sensation.

FP007
PREVALENCE AND EVOLUTION OF L’INFECTION AU VIRUS HUMAIN D’IMMUNODEFICIENCE VIH CHEZ LES LEPROUX EN HAITI


De Avril 1985 à Décembre 1987, 275 lépreux de 5 à 90 ans (200 tuberculoides, 75 lépromateux, soit 135 femmes, 140 hommes) ont été testés pour VIH par la méthode Elisa. Le taux de positivité est de 6.34 (13/200) chez les tuberculoides, et 6.84 (5/75) chez les lépromateux. Des 18 lépreux séropositifs préalablement asymptomatiques, 14 (78%) ont développé VIH à une période de plus de 18 mois.
riode de 6,3 mois (2-15 mois). 4/18 (22%) ont récidivé de leur lèpre sous traitement comparés à 2/257 nécrositaites (0,7%). Parmi les lèpreux préalablement nécrositaites, 75 suivis sur une période moyenne de 22,8 mois ont été rétectés. 7/75 (9,3%) ont séroconverti: 6 hommes et 1 femme, tous symptomatiques de l’infection par le VIH.

Conclusion:
- Chez les lèpreux, la séroprévalence de l’infection par le VIH est de 6,5%.
- 784 des lèpreux nécrositaites ont développé une symptomatologie associée au VIH.
- 224 des lèpreux nécrositaites ont récidivé de leur lèpre sous traitement.
- 9,3% des lèpreux nécrositaites ont séroconverti sur une période moyenne de 22,8 mois.

THE ANATOMICAL DISTRIBUTION OF SINGLE LEPROSY LESIONS IN AN AFRICAN POPULATION, AND ITS IMPLICATIONS FOR THE PATHOGENESIS OF LEPROSY.
Jorg M. Ponnighaus, Peter J.K. truer, Paul E.M. Fine, Department of Tropical Hygiene, Keppel Street, London WC1E 781.

Detailed data on the anatomical sites of single leprosy lesions found on 632 confirmed leprosy cases newly ascertained during total population surveys carried out by the LEPRO Evaluation Project in Northern Malawi will be presented and discussed. The data reveal a remarkable predilection of single lesions for the face (28.2%) and the extensor surfaces of the arms (25.0%).

IN AN AFRICAN POPULATION, AND ITS IMPLICATIONS FOR THE PATHOGENESIS OF DISEASE.

FP 009

TETANUS IN LEPROSY PATIENTS: REPORT OF 5 CASES
Richard M. Hodes, M.D. and Befekadu Teferedegne, M.D. Department of Medicine, Addis Ababa University (Eth), and Department of Community Medicine, Jimma Institute of Health Sciences, Ethiopia (Sel).

Five cases of tetanus in Ethiopian leprosy patients are reported. There were 4 males and 1 female; 2 TT, 1 BL, 1 LL, 1 unknown; 4 had no history of trauma, 1 had a nail wound. It might be expected for leprosy patients to have an increased incidence of tetanus. Studies from Africa and Asia indicate that tetanus is rare in leprosy patients. A series of 503 tetanus cases in adult Nigerians found no patient with leprosy. Significant levels of anti-tetanus antibodies have been found in non-immunized lepromatous leprosy patients, with up to 45% having protective levels, possibly due to bowel clostridium stimulating the lymphoid system. Furthermore, clostridium appears to be rare in the foot ulcers of Ethiopian leprosy patients.

The finding of these 5 cases, the first from Africa, is quite significant, and indicates that protection against tetanus is incomplete. Single-dose vaccination is recommended.

FP 023

TUBERCULOID RELAPSE IN LEPROMATOUS LEPROSY
Michael E. Waters and Dennis S. Ridley, Hospital of Tropical Diseases, University College and Middlesex School of Medicine, London, England.

In 1978, we presented 3 patients who, having commenced dapsone therapy when they were undoubtedly suffering from advanced lepromatous (LLa) leprosy, subsequently...
We now extend our observations, comparing this rare syndrome with that of the development of BT 1 reactions in apparently-quiet BT patients shortly after their commencing the 2-year course of MDT: Its relevance to immunotherapy, and the attempted induction of positive lepromin skin tests, will be discussed.

FP 024

Is the Proportion of New Indeterminate Leprosy Cases Dependent on the Screening Interval?


Departments of Medical Microbiology and Parasitology, Calcutta University, College of Medicine, Calcutta 700 020, India.

It is often suggested that many new leprosy cases classified as TT, BT, BB, BL, or LL have previously passed through an undetected, unmaintained stage prior to diagnosis. The implication of this hypothesis is that there is a shorter (potentially 1 year) interval between the onset of leprosy and clinical diagnosis. This study presents distributions of new cases found in two ethnically different high-risk populations in Paharpur, Mymensingh, by screening interval, age group, and disease. The implications of these findings for the development of disease control strategies are discussed.

FP 025

MOUSE FOOTPAD PATHOGENICITY OF THE CHEMOTROPHIC NOCARDIOFORM ISOLATES FROM HUMAN AND MOUSE FOOTPAD LEPROSY TISSUES.

M. Lepraemurium organisms as antigen and supernatants produced in Dutch Bantam rabbits using sensory peripheral nerve as antigen. In order to develop this model in an inbred strain we injected per 4-6 weeks, which subsided 4 weeks. After 7 months observation, skin lesions with hair loss appeared on the back of guinea pigs. After 7 months observation, 7 lesions had appeared, one lasting 5 months. Three Strain 13 guinea pigs injected with the same antigen have not developed any skin lesions after 3 months observation. Biopsy of the skin lesions in Strain 13 guinea pigs showed degeneration of myelinated fibres in the peripheral nerve. The antigen may be a component of the axoplasm of myelinated axons.
An experimental model of chronic nerve compression and the effect of the lepromin reaction on the development of chronic neuropathy.


Institute of Neuropathology, Institute of Neurological Sciences, Glasgow, Scotland.

The ulnar nerve at the elbow is one of the common sites of nerve involvement in leprosy and entrapment neuropathy. An experimental model of chronic compression peripheral neuropathy, resembling the ulnar nerve at the elbow was produced by amputating the right ulnar nerve of a mouse, using a monofilament polyamide thread. The left sciatric nerve acted as a normal control. In a controlled study of each animal half of them were inoculated with 4x10^6 H. leprae in both their hind foot-pads. Preliminary observations will be presented of clinical findings and ultrastructural changes of the variously wounded nerves of both infected and non-infected animals.

PGL-1 INDEPENDENCE OF THE LEPROMIN (MITSUDA) REACTION IN MANGABEY MONKEYS. 

L. E. Harris, Maggie Landry and Rita Sanchez

Laboratory of Physicians, National Institute for Medical Research, Mill Hill, London, U.K.

PGL-1, the principal, phthiocercal-containing glycolipid of Mycobacterium leprae, has been demonstrated to be species-specific and of major significance in the serologic responses of patients and experimental animals with leprosy. It has been shown that PGL-1 may be a specific factor in pathogenesis of the characteristic lesions of leprosy, it is a unique substance that could also be of importance in the development of skin-test reactivity to leprosy, particularly of the Mitsuda type. In fact, Job et al. reported being able to produce delayed-type hypersensitivity granulomas, with lepromin-compatible histology, by intradermal inoculation of large quantities of purified PGL-1 into lepromin- and lepromin-positive, but not lepromin-negative armadillos. However, because the quantity employed (100 µg) was 25-100 times that found in standard lepromin doses by high performance liquid chromatography (HPLC), questions of etiology in leprosy responsiveness in the armadillo model remain.

In order to explore further the role of PGL-1 in the lepromin reaction, guinea pigs pre-immunized with armadillo-derived lepromins or BCG were skin-tested with doses of 3-100 µg of the purified glycolipid in comparison with standard lepromin A, DHarmendra lepromin, sham lepromins and controls. Erythema and induration were measured for 4 weeks, and groups compared.

The results indicated a rapid appearance of initial, mild reactivity to intradermal injections of PGL-1 preparations, in contrast to observed, delayed-positive (Mitsuda) reactions to either lepromin A or DHarmendra lepromin at 2-3 weeks. These observations indicate that PGL-1 is not, itself, responsible for lepromin reactivity in the guinea pig model, and raise the possibility that previously reported reactivity to PGL-1 in armadillos could have been due to either, or co-extracted components of the leprosy bacillus.

PHENOLIC GLYCOLIPID-I ANTIGEN IN SOOTY MANGABEY MONKEYS

K. H. Ohashi, Gerald P. Walsh, Wayne M. Meyers and Cynthia B. Bradley

Department of Internal Medicine, University of Texas, Three Rivers Road, Covington, LA 70433 and the Armed Forces Institute of Pathology, Washington, DC 20306, USA.

We inoculated 4 pairs of sooty mangabey monkeys (Cercocebus atys) with serial, 10-fold dilutions of mangabey-origin Mycobacterium leprae. The high dose pair received 4.8 x 10^7 M. leprae. Animals were closely monitored for symptoms of leprosy and serum samples obtained at intervals for 35 months. Longitudinal serum samples were assayed by an ELISA method for IgG and IgM antibodies to the M. leprae-specific phenolic glycolipid (PG-I) antigen.

In general, the onset of symptoms paralleled the dose of M. leprae, but the ultimate course of disease depended upon individual animal susceptibility. Both IgG and IgM anti-PG-I isotypes were observed in variable levels and patterns, related to the disease stage, among the 6 mangabeys.

High IgG and low IgM anti-PG-I titers correlated with less severe disease, whereas, initial high IgG titers and/or rising or sustained high IgM titers, especially along the left sciatic nerve, were observed in animals with multi-foci nerve damage, as well as in areas with chronic nerve involvement. In many cases, low IgG and high IgM titers corresponded to periods of progressive leprosy.

The results show that both IgG and IgM anti-PG-I antibody isotypes can be present in significant titers among mangabeys early after infection with M. leprae. The relative levels of these anti-PG-I isotypes appear to be correlated with the susceptibility of individual animals to the development of lepromatous leprosy.

A generalized model of the lepromin reaction is pre-sensitized guinea pigs.

W. A. Krusinki, Cheryl Biggs, Martin Kuncio, Eugene Harris, Maggie Landry and Rita Sanchez

Laboratory of Physicians, National Institute for Medical Research, Mill Hill, London, U.K.

The lepromin reaction has been associated with dramatic changes in regional lymph nodes. The in vitro response of popliteal lymph node cells, following subcutaneous immunization with 100 µg of M. leprae antigens, was tested against mycobacterial antigens than when the animals were tested against mycobacterial antigens than when the animals were infected with M. leprae, demonstrated an immune response directed mainly to antigens of cellular origin which follows immunization with killed M. leprae. The former is a specific but system wide, generalized response, elicited most strongly in animals infected with M. leprae, whereas, the latter is a rapidly acquired, strong but localized, short-lived immune response directed mainly to antigens of glandular origin. Whether the two immune responses are mediated by the same cells or whether these responses reflect similar or divergent mechanisms with regard to protective immunity in currently under investigation. In animals infected with M. leprae are considered immune to reinfection, our results suggest that these immunological responses play a very important role in studies of acquired immunity in M. leprae.

ONTOCHELISIS OF ANTI-BODY IN RHESUS MONKEYS INFECTED WITH M. LEPRAE


New Delhi-110 067, INDIA

Adult healthy Rhesus monkeys (Macaca mulatta) selected on the basis of their negativity to M. leprae lepromin were inoculated with M. leprae by both the intravenous and subcutaneous routes. Monkeys were kept at regular intervals over a period of one year. In microplate ELISA sera were screened using ND-BSA, M. leprae sonicate antigens and monkey peripheral nerve antigen. The results of the study revealed that antilprotease antibodies appeared at a significantly high level first, followed by antibodies reactive with M. leprae antigens, and finally antibodies to phenolic glycolipid. After one year, the antibodies to antigens were absent in all the sera tested. The study was significant. At the time of titera collection, there are...
The phenotype and cellular distribution of major experimental lesions have been investigated using an electron microscopic study.

FP 035

Mycobacterial granulomas in the sciatic nerves of M. leprae-infected mouse with possible bystander and autoimmune demyelination: an electron microscopic study.

1 University of Keele, Department of Postgraduate Medicine, Staffordshire, U.K.
2 Department of Neuropathology, Institute of Neurological Sciences, Glasgow, Scotland.
3 Laboratory for Leprosy and Mycobacterial Research, National Institute for Medical Research, Mill Hill, London, U.K.

The pathologic changes within the sciatic nerves of nude mice were observed ultrastructurally. The progression of these changes were observed at various intervals from 3 to 22 months post-inoculation. Vascular changes were observed in the early stages, even in the absence of detectable infection. Endogenous expression of infection was observed in the latter stages, myoepithelia, myelin, and cellular debris were found extracellularly and within myelinated phagosomes. Active macrophage processes appeared to encircle normal looking myelinated fibers without any bacilli within them. The Schwann cell cytoplasm of these fibers appeared to flow towards these processes suggesting some affinity between them. In the vicinity of these active phagocytic processes there was disruption of myelin, suggesting an extracellular enzymatic mechanism in play. Macrophages also invaded demyelinated fibers and their 'foot-like' cytoplasmic processes were actively stripping myelin. Extracellular disruption of myelin was also observed close to mast cells and plasma cells. It is known that macrophage-mediated immune mechanisms are operational when severe infections with intracellular pathogens occur, and the role of such mechanisms in nerve damage will be discussed.

FP 036

LEPROSY IN THREE SPECIES OF MONKEYS—AN OVERVIEW


Nonhuman primates show great promise as models for studying the pathologic changes associated with leprosy as well as evaluating experimental vaccines.

We have experimentally infected three species of monkeys with Mycobacterium leprae. Of 33 mangabeys inoculated, 23 (70%) developed infection. Twenty-two mangabeys developed BL-LL disease, and one had a leuconitic form of leprosy with evidence of erythema nodosum leprosum (ENL) in the ulnar nerve. Mangabeys with disseminated disease responded well to treatment with antileprosy drugs. A second mangabey was recently diagnosed with naturally-acquired leprosis. Seven rhesus monkeys inoculated with M. leprae have developed active leprosy and this species shows promise as an alternate model for laboratory studies in leprosy. African green monkeys inoculated with M. leprae developed polymorphic leprosy; this species may be of great value in studies of the nerve damage associated with leprosy.

FP 037

INDUCTION OF THE LATE HYPERSENSITIVITY REACTION TO DNCB IN PATIENTS WITH DIFFERENT CLINICAL FORMS OF HANSENIAISIS IN BRAZIL.

Ruben David Araujo
Federal University of Rio de Janeiro
Rio de Janeiro, Brazil

One hundred and twenty Brazilian patients with several forms of Hanseniasis were tested with DNCB.

1. The sensitization of patients with hanseniasis to DNCB was lower than seen in the general population.
2. The sensitization of the borderline and virchowian forms of Hanseniasis was lower than seen in the indeterminate and tuberculosis forms.

Conclusion: There is a deficiency of the late immunity in the borderline and virchowian forms of Hanseniasis.
SERA OF LEPROTIC PATIENTS WITH ENL: AN INCREASE OF COMPLEMENT ACTIVITY IN REACTIONAL STATES IN THE ENL PATIENTS, ESPECIALLY WITH RESPECT TO THE CONTROLS.


London School of Hygiene and Tropical Medicine; F. B. University of Edinburgh, Scotland; T. Royal Postgraduate Medical School, London; Tufts New England Medical Center, Boston, USA.

The origin of autoantibodies in patients with leprosy was investigated by preparing human hybridomas from peripheral blood lymphocytes of a lepromatous patient fused with the human lymphoblastoid cell line RBL 6571. Hybridomas were tested for binding to a DNA extract from M. leprae and a panel of autoantigens in solid phase ELISAS. Of the 92 primary (uncloned) cultures, 12 bound to DNA, 35 bound M. leprae, 11 bound both M. leprae and DNA and 16 bound to mitochondria. Several also bound to the acetylcholine receptor (AChR) of Torpedo marmorata. Monoclonal antibodies (MAb) derived from separate primary cultures revealed cross reactions between autograph antigens and M. leprae, including M. leprae with which bound mitochondrial and the AChR. This suggests that M. leprae elicited autoantibody expression from the immune repertoire.

Killing of human monocytes by specific cytotoxic T cells and monospecific MHC-restricted killer cells after activation by mycobacterial antigens

Birhanu Kalesh, Rolf Kissing, Paul Conviet, Genet Tadele, Martin Rottenberg and Tom Ostendorf
Armauer Hansen Research Institute, P.O. Box 1005, Addis Ababa, Ethiopia.

Little is known about the nature of the cytotoxic T cells that eliminate human monocytes/macrophages infected with mycobacteria. We developed a cytotoxicity assay in which infected and Cr-labelled monocytes were used as targets. As effector cells, PBL from healthy immune donors or leprosy patients were educated by antigen for seven days. Results indicate that efficient cell killing of autologous monocytes was induced by both BCG and M. leprae. Killing was generally higher against infected B cells than non-infected targets, although there was still significant killing of the latter as well. Cytotoxicity could be generated only with PBL from good LTT responders. Crossreactivity was observed between BCG and M. leprae but not with an unrelated antigen (tetanus toxoid). Killing of infected and non-infected allogeneic monocytes was as high as that of non-infected autologous ones. Parallel assays for natural killer (NK) cells showed that high NK activity was generated both by BCG and M. leprae. Recombinant IL-2 alone also generated cytotoxic effector cells (so-called lymphokine activated killer cells) which equally lysed both infected and non-infected...
Circulating level of IgG molecules on which domain of the IgG heavy chain. It has recently been observed that in several disease states, and that it is involved in cytokine release from macrophages. Its production during ENL therefore carries some light on the pathogenesis of this reaction.

In contrast to the situation in Tuberculosis, levels of agalactosyl IgG are not raised above normal even after evidence of complement activation during episodes of lepra reactions in lepromatous patients. The possibility of this defective CMS being a predisposing cause of lepra reactions will be discussed.

There is a biantennary oligosaccharide on a conserved N-glycosylation site on the C2 domain of the IgG heavy chain. It has recently been observed that in several disease states (rheumatoid arthritis, Crohn's disease and lepromatous leprosy) there is an increase in the clouding of IgG molecules on which this oligosaccharide lacks terminal galactose, and so terminate with N-acetylglucosamine (agalactosyl IgG).

In the case of a patient with lepromatous leprosy, levels of agalactosyl IgG were accompanied by high levels of glucocorticoid receptor content in lymphocytes. These findings indicate that the likely mechanism for Type I reactions involves transient or intense activation of T-helper cells, together with their recruitment and proliferation within the lesion. These findings show that mycobacteria can release from macrophages. Its production during ENL therefore carries some light on the pathogenesis of this reaction.

In intracellular and soluble immunoregulatory events in type I ("reversal") reactions. These findings show that the likely mechanism for Type I reactions involves transient or intense activation of T-helper cells, together with their recruitment and proliferation within the lesion. These findings show that mycobacteria can release from macrophages. Its production during ENL therefore carries some light on the pathogenesis of this reaction.

The 12 patients who developed lepra reactions had lowered complement mediated IC solubilisation (CMS). The leukocytes of untreated patients and monitored their CMS activity sequentially while on therapy. In addition, the complement system is held to play a vital role in the pathogenesis of some of the reactions in leprosy. In contrast to the situation in Tuberculosis, levels of agalactosyl IgG are not raised above normal even after evidence of complement activation during episodes of lepra reactions. The possibility of this defective CMS being a predisposing cause of lepra reactions will be discussed.

In intracellular and soluble immunoregulatory events in type I ("reversal") reactions. These findings show that the likely mechanism for Type I reactions involves transient or intense activation of T-helper cells, together with their recruitment and proliferation within the lesion. These findings show that mycobacteria can release from macrophages. Its production during ENL therefore carries some light on the pathogenesis of this reaction.

* Sacred Heart Leprosy Centre, Sakkottei, Thanjavur District, Tamil Nadu, India.
* Tuberculosis Research Centre, Madras-600 031 India.
Tumor necrosis factor (TNF) is a cytokine with a broad range of biological activities. By means of cytotoxic activity for L3T4 (I-A') tumor cells, we have assessed the levels of TNF in the serum and in supernatants of peripheral blood mononuclear cell cultures (PBMC) from a group of patients with the polar forms of leprosy (T and L patients) and from healthy controls. Of the 6 T leprosy serum samples tested, 5 contained between 280 to 340 T U units/ml. The levels of TNF were within the normal limits (less than 60 units/ml) in 6 L leprosy patients and in 20 healthy individuals sera tested.

PBMC from T patients stimulated with S. typhimurium lipopolysaccharide (LPS, 10pg/ml) or with lepromin (1x10^10 bacilli/ml) released high levels of TNF in vitro assay (220±22 units/ml). In contrast, patients showed depressed production of TNF in cultures of PBMC stimulated with LPS or lepromin (65±28 units/ml). Spontaneous TNF synthesis in unstimulated cultures of PBMC from T patients was significantly increased when compared with that observed for healthy individuals and for L patients.

The data presented here permitted us to speculate that the increased TNF synthesis by PBMC from T leprosy patients could be related with the control of the host response in leprosy.

Supported by FAPESP and CNPq.

GLUCOCORTICOID RECEPTOR AND LYMPHOCYTES IN LEPROSY

S. Sheriff, A.K. Sharma*, A. Parooq* and N.K. Vaidya
Cellular Immunology Laboratory, Department of Anatomy and Reproductive Biology, All-India Institute of Medical Sciences, New Delhi, India.

**Department of Dermatology and Venerology, Ram Manohar Loha Hospital, New Delhi, India.

Quantitative study on glucocorticoid receptors was made in 56 lepromatous patients, 27 patients suffered from Tuberculoid leprosy, 9 reactional patients and 30 healthy controls.

Radioreceptor assay for glucocorticoid was employed while using tri-dexamethasone as a ligand in the whole cell assay of lymphocytes from the groups studied. More than two-fold increase in glucocorticoid receptor content in lymphocytes was noticed in lepromatous patients. Lymphocyte transformation study also shows that H. lepere were able to increase the glucocorticoid receptor content when lymphocytes were stimulated with dexamethasone. Evaluation of glucocorticoid receptor content in purified T-cells on nylon wool column indicate that the increase in receptor content in lepromatous patient is mainly confined to T-cells. Cell sensitivity assay to dexamethasone shows that the lymphocytes of the lepromatous patients are more susceptible to steroid induced cytolyis. The emerging hypothesis from this study indicates the possibility of endogenous glucocorticoid involvement in T-cell lymphopenia, inhibition of IL-2 synthesis by suppression of IL-2R expression and inhibition of clonal expansion of H. lepere reactive T-cells in lepromatous patients. However, it needs further confirmation.

LEPRA REACTIONS AND DISABILITIES IN PATIENTS TREATED WITH DAILY MDT IN NEW CALEDONIA, FRENCH POLYNESIA AND GUINEA-BISSAU

F. Robin, J.L. Castel, C. Guidi and J.H. Croiset
Centre Polyvalent Nouvelle-Caledonie, Institut Malaria, Tahiti, Institut Pasteur Guadeloupe and Groupe Etude Leper, Institut Pasteur Paris, France.

Since January 1980, in New-Caledonia, French Polynesia and Guinea-Bissau, the incidence of leprosy has decreased. During the past 24 months, 369 patients have been cured of leprosy. The ENL appeared in majority of patients between 6 months to 2 years of treatment and required corticosteroids.

The following data were collected: Age, Sex, Colour of the skin, type of reaction, number of erythema nodosum leprosum reactions, symptoms of first ENL and its development and symptoms of the reversal reactions. 179/77 cases of leprosy registered for treatment between commencement of MDT and till January 1983. Of which 127/93 are MB cases and 107/21 are LL cases. 23/5 MB cases and 15/9 PB cases developed reaction within period of 2 years treatment.

It was observed that all patients showed ENL were LL and those that showed reversal reaction were BB, BT and BL. The ENL appeared in majority of patients between 6 months to 2 years of treatment and reversal reaction between 6 months and 1 year of treatment. 33 patients required hospitalization, out of which 31/20 were MB and remaining 2/10 cases.

The ENL was treated with high dosage of corticosteroids and analgesics, the reversal reaction with chloroquine, analgesics and steroids. The improvement in all cases was satisfactory.

MILLIARY INFECTION IN MULTIBACILLARY HANSEN'S DISEASE--PRACTICAL AND CLINICAL MANIFESTATIONS

Richard L. Prashar, M.D., State of Hawaii, Department of Health, Hansen's Disease Community Program, 3650 Leilani Avenue, Honolulu, Hawaii 96816

Orchitis is well-recognized as a problem in patients with multibacillary leprosy. This may result from two distinct pathologic processes. There may be direct infection of the testis by Mycobacterium leprae with testicular damage produced by the associated inflammatory reaction. Alternatively, orchitis may be a part of a Type 2 reaction (Erythema Nodosa Leprosum) with destruction of testicular tissue resulting from immunologically-mediated inflammation.

Clinically, orchitis may be manifest as an inflammatory disease characterized by acute or chronic inflammation of the testes. Alternately, the primary manifestations may be those produced by a deficiency of gonadal hormones due to testicular atrophy and destruction of the Leydig cells which produce testosterone.

Most of the clinical data available is derived from studies of men known to have testicular insufficiency, for example those with gynecomastia. There has been little or no correlation with clinical characteristics of the Hansen's disease of the patients studied. In this study, testicular function was assessed in a group of men with multibacillary leprosy. Serum levels of testosterone, luteinizing hormone (LH), and follicle stimulating hormone (FSH) were assayed. Clinical evaluation of those with abnormal results is presented. In addition, characteristics of Hansen's disease in terms of duration of disease, bacillary status, treatment, and Hansen's disease complicating other than gonadal insufficiency are presented.
ETUDE EPIDEMIOLOGIQUE DES DEFORMATIONS CHIRUR- 
GICALEMENT CURABLES DE 1059 PATIENTS HABITANTS 
EN ZONE RURALE.
E. CAUSSÈE, M. RACHAVIA, C. MISSION.
Clinique chirurgicale B (Pr J. BARBOTTI), CHU 
Trousseau 37044 Tours Cedex France.

Houerijckx, Rural Centre, Auroville 605101 
Pondicherry India.

Faculté de médecine Louvain la Neuve Bruxelles 
Belgique.

Avec une prévalence globale de 19% , le 
Tamil Nadu en Inde du Sud est un des états 
les plus endémiques. Au Houerijckx Rural 
Centre, près de Pondicherry nous avons revu 
um échantillon de 1019 patients dans le 
but d’apprécier l’importance des déformations 
chirurgicalement curables et les obstacles 
rencontrés par cette chirurgie.

Les déformations des mains, des pieds, de 
la face ont été particulièrement étudiées en 
fonction du sexe, de l’âge, du type lépreux, 
de l’activité et de la durée enregistrée 
de la maladie, de la nature du traitement 
et sa régularité, enfin de la nature du 
travail.

Les résultats sont discutés.

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Abstracts of Congress Papers

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FP 059

PATHOLOGY OF ERYTHROMA NODOSUM LEPROSUM IN MALAYSIA

Kritishnan Subramaniam and Suzzy C Marks Jr.
Department of Anatomy, Faculty of Medicine, University of Malaya, 59100 Kuala Lumpur, Malaysia

The tripartite resorption of osseous projections of the maxilla, posterior maxillary radiographs. Loss of the antero-inferior part osseous projections of the maxilla, was evaluated. The tripartite resorption of osseous projections of the maxilla, was evaluated. The results showed that resorption of bone and cartilage in the nasal septum is not known.

FP 060

A DISABILITY SURVEY IN 14130 CASES OF LEPROSY

Iehenglishen, Pan iengyong, Fang Huaiie, Wu Ciuyong, Is Neihong, Lion Busiian

The frequency of patients with WHO disability grade 3 reached 418 (34.0% of 1204 cases) though in 2001 this figure was 28% developed reaction in the two areas, since they are independent of each other. The capacity of peripheral blood lymphocytes to facilitate the measurement of T-cell subsets in the same animals. Our data show that clofarimine did not affect the immune response. Receptors for anti-erythrocyte anti-body in LL macrophages are demonstrated by inhibition of phagocytosis. Sponges containing a majority of lepromatous leprosy patients.

FP 061

THE EFFECT OF CLOFARIMINE IN CELL-HYDRAILD INNEUTRINt INTLRIFRENCE

The evidence that MDI has some depressing effect on T-cell functions, together with the failure of Bi to induce in rats by restraint to fall to zero with prolonged treatment in some cases, will have major role in MDI. It has anti-stress activity. Dan Racine at al showed that gastric ulcers induced in rats by restraint were reduced by 50% by DES.

FP 062

THE EFFECT OF CLOFARIMINE IN CELL-MEDIATED IMMUNITY: ENHANCEMENT WITH ANTILIN PROCESSING AND PRESENTATION BY HAL HOPHASE S.

The authors note that all the above-mentioned factors showed the severity of the leprosy disability problem in China today. It should be emphasized that treated disease is not synonymous with the street of disability. Therefore objectives of leprosy control should have the following procedures (a) reduce the incidence, (b) to care patients and attain complete rehabilitation and (c) to prevent deformities. Finally, the problem involved in disability surveys are discussed.

FP 063

THE EFFECT OF CLOFARIMINE IN CELL-HYDRAILD INNEUTRINt INTLRIFRENCE


The effectiveness of clofarimine in the treatment of leprosy as well as in other murine leprosy infections (ML) is well documented. The mechanism by which clofarimine affects its effectiveness in MD, however, unclear. Recent data suggest that the pathogen of ML may involve cell-mediated immune response. The study presented here examined the ability of various immune responses of clofarimine-treated BALB/c mice. In addition, we examined chlamydial infections. Our data show that clofarimine did not reduce antibody-producing cells in response to purified protein derivative. The results indicate that a similar sterilizing regimen could be used safely and effectively in Type I reaction with or without associated nerve damage. Collected data of few patients before and after treatment will be shown.

FP 064

DIFFERENTIAL DIAGNOSIS IN 480 CASES OF LEPROSY

Dong Yubing, Yan Jiangang, Fang Huaiie, Wu Ciuyong, Eieh Kuo, Liu Nei, Li Nei, China Leprosy Center, Guangzhou, China

In order to obtain more basic data on disability in leprosy, disability surveys were carried out in two leprosy hospitals in one city and in one county in 1983. WHO disability grading with minor modifications was used for the survey. The causes of the disabilities were investigated.

FP 065

DFS, AN ANTI-LEPROSY DRUG WITHOUT SIDE EFFECTS


"Foundation for Medical Research, Hongay", "Institut de Cine des Substances Naturelles, Paris, St George’s Hospital London"

The incidence, ID to cure patients and attain complete rehabilitation and ID to prevent deformities, finally, the problem involved in disability surveys are discussed.
To assess the killing activity of a daily treatment with C.C. Cuelpa-Lauras, L. N'Deli, E. Perani, J. Grosset,^1
proportion of viable organisms recovered from the pre-
treatment and after 2, 4 and 6 months of treatment. The
activity led us to perform another trial with ofloxacin,
60.32 to 99.58 per cent and when studied with nude mice
in normal nor in nude mice. One biopsy yielded organisms
recovered in mice from biopsies taken after
77, 540.

EFFECT OF OXEOFACIN ON EXPERIMENTAL LEPROSY
Kenji Kohsaka, Yasuyo Miyata and Tostetaro Hm
Department of Leprology, Research Institute for Microbial Diseases, Osaka University, Suita, Osaka, Japan.

Ofloxacin, a quinolone compound and a synthetic anti-
biotic which has a wide spectrum and its anti-mycobacterial
activity in vitro and in vivo has been reported. The
effect of ofloxacin on experimental leprosy with nude and
normal mice was examined.

M. leprae originated from a LL patient and serially pas-
saged through nude mouse foot pad were inoculated into
right hind foot pads of nude and/or normal mice. The
infected mice were treated with ofloxacin by giving the
drug containing diet or administering the drug by gavage once daily.

The results suggest that ofloxacin is effective to suppress the growth of M. leprae in both the nude and normal mice. In nude mice, ofloxacin treatment with drug containing diet in concentration of 0.025% for 100 days was slightly effective, and with 0.05% or 0.075% drug containing diet for 100 days showed suppressive effect in the growth of M. leprae. Dose response of the drug was observed in subgroups of the treated mice. In normal mice, however, even in the group treated with 0.075% drug containing diet showed no effect. On the other hand, normal mice treated with ofloxacin 1 mg by gavage 6 times a week for 100 days (equivalent to 0.035% in diet) showed significant effect to suppress the growth of M. leprae.

THE ACTIVITY OF MINOCYCLINE AGAINST M. LEPRAE-INFECTED MICE.

Robert Gelber, Patricia Sin, Mabel Tsang, and Edward Murray

Previously tetracycline itself was found in mice by others to be inactive for M. leprae. However certain tetracyclines, doxycycline & especially minocycline, are active in vitro against cultivable mycobacteria & have been for some time now been used to treat leprosy patients. We report here the use of minocycline for treatment of leprosy patients. In our first study with these tetracycline derivatives, groups of M. leprae-infected mice were treated by the Kauffman-White technique (therapy from day 60 to 130 following foot pad infection) with doxycycline (0.025% & minocycline 0.05%). Doxycycline was inactive but minocycline delayed multiplication for 270 days after discontinuation of therapy. Further, our recent study, conducted utilizing the proportional bacteriostatic technique, minocycline was bactericidal for M. leprae. In our second study by the kinetic technique, we found that dietary minocycline 0.01% & 0.02% were bactericidal & even minocycline 0.004% & 0.001% were active. By an agar disk diffusion method utilizing the minocycline-sensitive Rachel strain, ATCC 17178, we established in this study that the mouse minimal inhibitory serum concentration for minocycline is 0.02 µg/ml, which is several fold by standard test conditions with this commercially available tetracycline. Further, in this study minocycline's activity against M. leprae was found additive with dapsone, kanamycin, and rifampin.

The results of our final study, conducted utilizing the proportional bacteriostatic technique, minocycline was found impressively bactericidal, 99.2 ± 0.72 alone & 99.7 ± 0.28 when combined with dapsone. This profound bactericidal activity is likely a result of minocycline's unique lipophilicity amongst the tetracyclines, & hence its ability to penetrate the largely lipid outer capsule & to enter M. leprae. In our final study, conducted utilizing the proportional bacteriostatic technique, minocycline was found impressively bactericidal, 99.2 ± 0.72 alone & 99.7 ± 0.28 when combined with dapsone. This profound bactericidal activity is likely a result of minocycline's unique lipophilicity amongst the tetracyclines, & hence its ability to penetrate the largely lipid outer capsule & to enter M. leprae. In our final study, conducted utilizing the proportional bacteriostatic technique, minocycline was found impressively bactericidal, 99.2 ± 0.72 alone & 99.7 ± 0.28 when combined with dapsone. This profound bactericidal activity is likely a result of minocycline's unique lipophilicity amongst the tetracyclines, & hence its ability to penetrate the largely lipid outer capsule & to enter M. leprae. In our final study, conducted utilizing the proportional bacteriostatic technique, minocycline was found impressively bactericidal, 99.2 ± 0.72 alone & 99.7 ± 0.28 when combined with dapsone. This profound bactericidal activity is likely a result of minocycline's unique lipophilicity amongst the tetracyclines, & hence its ability to penetrate the largely lipid outer capsule & to enter M. leprae. In our final study, conducted utilizing the proportional bacteriostatic technique, minocycline was found impressively bactericidal, 99.2 ± 0.72 alone & 99.7 ± 0.28 when combined with dapsone. This profound bactericidal activity is likely a result of minocycline's unique lipophilicity amongst the tetracyclines, & hence its ability to penetrate the largely lipid outer capsule & to enter M. leprae. In our final study, conducted utilizing the proportional bacteriostatic technique, minocycline was found impressively bactericidal, 99.2 ± 0.72 alone & 99.7 ± 0.28 when combined with dapsone. This profound bactericidal activity is likely a result of minocycline's unique lipophilicity amongst the tetracyclines, & hence its ability to penetrate the largely lipid outer capsule & to enter M. leprae.

Gangliosides have been used successfully in various forms of Peripheral Neuropathies. We have conducted a clinical trial of Cramanosil's solution[5] in 246 leprosy-patients who had sensory/motor/sympathetic changes, in a dosage scale of 40 mg./d. daily for 6 months. The trial was conducted at 6 centers in 4 cities in India. The data collected, 350,000, are still under evaluation. The results, very encouraging, will be presented in details. The discussion will deal with nerve regeneration (based on the theory of Nobil, W. Levi-Montalcini, and the role of Nerve Growth Factor).
conserved. 3EI2 which can form amphipathic structures predicted regions of the sequence which are not highly T cell epitope analysis algorithms have located homology between the N terminus of M.bovis DCG and the M.tuberculosis homology with the M.tuberculosis numerous regions within the amino acid sequence of conditions. There is extensive homology at both nucleotide and gene as shown by hybridi,ation under stringent affinity purified 70E31 antigen and the consensus terminal amino acid sequencing data which showed less homology with other members of the hsp70 family of the dnaK gene of E.coli (55% and 51%) and slightly mapped and the calirrj region sequenced and found to 3E115 from the M.leprae-%gt11 library of R. Young. There is extensive homology at both nucleotide and amino acid contain a 1037bp open readirxj frame encoding the 344

ANTIGEN

M.scrofulaocum. The M.bovis DCG 70 ED antigen is a immune response in M.bovis, M.tuhorculosis region of the M.leprae 70kd protein.

The 70 ED antigen is a important stimulator of immune response in vivo and in vitro. Using 17 we have isolated cloned JM2 and J25S from the M.leprae antigen library of R. Young. The DNA insert from the 17 open reading frame encoding the 144 amino acid Cxx region of the M.leprae 70kd protein. There is extensive homology at both nucleotide and amino acid level between this coding region and that of the dnaA gene of E.coli (55% and 51%) and slightly less homology with other members of the hsp70 family such as those in the salmonella parasite Agt and in avian. This nucleotide sequence data complements a terminal amino acid sequencing data which showed homology between the the terminus of M.leprae K60 affinity purified 70kd antigen and the consensus sequence of the eubacterial and prokaryotic hept0 proteins. The J25S insert DNA also has extensive homology with the M.tuberculosis 730 protein antigen gene as shown by hybridisation under stringent conditions. The cell culture analysis algorithms have located numerous regions within the amino acid sequence of J32S which can form amphipathic structures predicted to be candidate "T cell epitopes" and these include regions of the sequence which are not highly conserved. Under "in vivo" conditions the pharmacokinetic properties of a drug determine its concentration at the appropriate receptor site. These properties might be different from those leading to pharmacodynamic response. In this case it should be possible to synthesise drugs with optimal pharmacokinetic behaviour without loss of activity. Data analysis was carried out using multiple linear regression- and principal component analysis. The results showed that the lipophilicity (log P) of these compounds which were generally filtered gave a good correlation with several pharmacokinetic parameters.

CORRECTION OF SEVERE FOOT DEFORMITIES BY A SIMPLE TECHNIQUE.

George Abram, A.M.C. van Asbeck-Raat and Hein E.M. Bergh.

International Anti Leprosy Organization, Takoradi, Ghana.

Dr. H.S.M. Raat, Orthopaedic Surgeon, is well known for his many interventions in reconstructive surgery for polio and leprosy patients around the world. It was through a mutual acquaintance, Dr. J.A. Worsdoff, that we were able to get Dr. Raat to come to Ghana. After many successful operations in foot reconstruction we thought it would be helpful to put his experience into writing. The purpose of this paper is to outline an operation he has performed many times over the past fifteen years to correct severe fixed equino-varus deformities in post-traumatic cases.

The same technique has also been used for leprosy patients who were on the list for amputation because of severe stiff equino-varus feet with recurring ulcers. The results in all cases were very satisfactory and encouraging. The technique of the operation is presented and discussed here together with the results in more than fifty cases.

The 70 ED antigen of M.leprae defined by Job L7 has a homology in M.bovis, M.tuberculosis and M. tuberculosis. The M.bovis 70 KD antigen is a potent stimulator of immune human T cells in vivo and in vitro. Using 17 we have isolated cloned JM2 and J25S from the M.leprae antigen library of R. Young. The DNA insert from the 17 open reading frame encoding the 144 amino acid Cxx region of the M.leprae 70kd protein. There is extensive homology at both nucleotide and amino acid level between this coding region and that of the dnaA gene of E.coli (55% and 51%) and slightly less homology with other members of the hsp70 family such as those in the salmonella parasite Agt and in avian. This nucleotide sequence data complements a terminal amino acid sequencing data which showed homology between the the terminus of M.leprae K60 affinity purified 70kd antigen and the consensus sequence of the eubacterial and prokaryotic hept0 proteins. The J25S insert DNA also has extensive homology with the M.tuberculosis 730 protein antigen gene as shown by hybridisation under stringent conditions. The cell culture analysis algorithms have located numerous regions within the amino acid sequence of J32S which can form amphipathic structures predicted to be candidate "T cell epitopes" and these include regions of the sequence which are not highly conserved. Under "in vivo" conditions the pharmacokinetic properties of a drug determine its concentration at the appropriate receptor site. These properties might be different from those leading to pharmacodynamic response. In this case it should be possible to synthesise drugs with optimal pharmacokinetic behaviour without loss of activity. Data analysis was carried out using multiple linear regression- and principal component analysis. The results showed that the lipophilicity (log P) of these compounds which were generally filtered gave a good correlation with several pharmacokinetic parameters.

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The study was started in April 1986. A total of 346 post-leprosy patients, mostly residing in satellite communities around the Buerger (Old) leprosarium were sequentially admitted and assigned to the four vaccine regimens: Group A (placebo), Group B (BCG), Group C (BCG, 6x10^6 BCG), and Group D (BCG + IIC8). Vaccinations were done every three months for a total of eight vaccinations. Total vaccine dose per vaccination, was equally divided into three parts and intradermally injected to three skin sites. Skin testing with SMLA was done every three months, three days prior to the vaccinations. Reactions to SMLA were scored at 72 hrs.

The patients were regularly observed for the occurrence of untoward reactions and side-effects.

Preliminary results of the trial will be presented and discussed, as well as the observed side-effects and acceptability of the procedure.

This investigation received financial support from the ROC-NIAID Special Program for Training in Tropical Diseases.

Evidence that Mycobacterium leprae-specific helper T cells exist in lepromatous leprosy patients
H.K. Gill, A.D. Mustafa, D. Ridley, M.J.W. Rees and T. Godal
Immunology Division, Institute for Medical Research, Kuala Lumpur, Malaysia

A study of the proliferative responses of peripheral blood mononuclear cells revealed that while 15 of the 16 untreated LL patients and 5 of the 10 treated LL patients responded to M. leprae but not to BCG, T cell clones from the long-treated LL patients were raised from 2 of these long-treated LL patients, using standard techniques. For this reason, such clones were also prepared from 2 Tuberculoid (TT) patients. All of the 5 T cell clones from the TT patients and 6 of the 13 T cell clones from the long-treated LL patients responded to M. leprae but not to BCG in proliferation assays. Some of these CD4+CD8- clones were further screened for reactivity to other Mycobacteria and to the 5 recombinant protein antigens. Five clones (3 from TT patients and 2 from an LL patient) responded only to M. leprae while 2 clones (from an LL patient) responded to various other mycobacterial antigens. None of the clones responded to any of the recombinant antigens.

FP 003
T-CELL RESPONSES TO THE M. LEPRAE 18KDA ANTIGEN

D.P. Harris, R.A. Booth, and J.D. Watson
Department of Immunology, Auckland University School of Medicine, Private Bag, Auckland, New Zealand.

The helper T-lymphocyte plays a fundamental role in providing protective immunity against Mycobacterium leprae, the causative agent of leprosy. M. leprae is an antigenically complex pathogen. However, the identification of potentially protective antigens has been greatly facilitated by the cloning and expression of a number of M. leprae genes. Of particular interest to this laboratory is the immunological responsiveness of T cells to an 18KDA recombinant M. leprae antigen. The presence of T cell epitopes have been described with polyclonal and monoclonal T-cell response assays. Polyclonal responses have been generated with T cells from mice immunized in vivo with recombinant HBD proteins and subsequently challenged in vitro with whole M. leprae antigen. Human and murine T cell clones reactive with M. leprae have also been assayed with recombinant antigens. Our results indicate the 18KDA protein is a potential candidate for an immunodominant T cell epitope.

FP 004
Screening for T cell reactivity to recombinant M. leprae peptides

Jagannath I. K. Loz, S. and Nath, I.
Department of Pathology, Biotechnology Laboratories, All India Institute of Medical Sciences, New Delhi-110 029, India.

Peripheral blood mononuclear cells (PBMC) and T cell lines derived from leprosy patients were used to assess the efficacy of T cell lysis antigen (M. leprae genomic library obtained from R.A. Young) for T helper ability to stimulate T cells. Each lysate was made with a random pool of about 5000 plaque forming units. Since, T cell lysis has to be either toxic or stimulatory, various concentrations have been used in the proliferative assay. Of the six tuberculoid patients tested, preliminary results indicate the lysis of T cells in four patients (stimulation index of more than 2) whereas P, P4 and P7 were stimulatory in three cases each. Significantly four out of five healthy subjects responded to P, lystate antigen whereas lyses P, P4 and P7 had no effect on any of the healthy individuals. Screening of these antigens for T cell reactivity may be useful in elucidating the immunodominant T cell epitopes of M. leprae.

FP 002
MOLECULAR PATTERN OF THE T-CELL REPERTOIRE IN LEPROSY PATIENTS AND THEIR RELATIVES.

Hendry-Somporia, F., Lamb, H.K., Ellis, C.J., Stanley, P. and Nonyo, J.
MBC Tuberculosis and Related Infectious Unit, Hammersmith Hospital, London and Department of Medicine, East Birmingham Hospital, Birmingham, England.

The diversity of antigen recognition by the T-cell repertoire in leprosy was investigated using antigenic peptides from nitrocellulose particles from SDS-polyacrylamide gel electrophoresis. Twenty fractions from soluble extracts of M. leprae and M. tuberculosis covering the 10-100 kDa molecular weight range were produced in a manner which sustained the proliferative (triplicates at two concentrations) of peripheral blood mononuclear cells from 15 donors. Reproducibility of the technique with satisfactory resolution has been demonstrated by repeated analysis of representative samples. Individual patterns of specificity were observed comparing the responses to fractionated or whole M. leprae and M. tuberculosis. Different fractions were obtained when comparing the source case with the family contacts. At least in one case, the response to fractionated antigen was profoundly above the stimulation by whole mycobacterial extracts. The most frequent stimulatory antigen of M. leprae appeared with the molecular weight of 25 kDa (34%), 27-31 kDa (5%), 12-14 kDa (12%) or 60-65 kDa (25%). Moreover, the stimulatory fractions from M. leprae and M. tuberculosis did not overlap in the majority of cases, thus indicating the immunodominant role of species-specific T cell epitopes.
protein required to induce similar amounts of IL-2 when using spleen cells as antigen presenting cells was dramatically higher than that required when using IEC cells. IEC cells were unable to efficiently present nontubercular antigens. Our findings suggest that one could utilize antigen-specific hybridomas to generate and propagate T-cell clones of desired specificity. Such an approach should be useful in the development of vaccines designed to induce T-cell mediated immunity.

INTRODUCCION DE MICROBACTERIA VACCINAS MUERTAS IN-
DUCEN RESPUESTAS INTRADERMICAS FREnte ANTIGENOS 
DOS SOLICLLES DEL M. LEPRAE EN 20% DE PACIENTES 
LEPROPATRÓNICOS

E.J. Standoford & J.F. Ferraro de las Aguzas
Consejo Sanitario de San Borja
Fontilles España

La ausencia de respuestas medias por células frente al M.leprae en lepra multilocal
lar no se recupera al finalizar la quimiotera-
pia y conseguir la sensitización bacteriológi-
a.Unos investiga 12% de estos pacientes por inyecciones intradérmicas anuales de Tubercull-
im, Lepromina A, Sorolftina y Vacuna durante un periodo de 5-6 años. Se describen los efectos de la administración de dosis ulimicas de 10^10 o 
10^11 vacunas muertas por intradérmica durante este periodo. Se observa una conversión positiva a Leprosina A en 5/29, 0,6 y 12/32 pacientes respectivamente. En el grupo control sin vacuna la conversión (ve de 1979, Abadie D., et al., De Tuberculina a 10^8, Vacuna pre- 
versiones en 12/23 pacientes. La tuberculosis redujo de manera significativa la respuesta lo- 
cal a la inmunización y se encontró una correla- 
t or entre la respuesta local 7 días después de la inmunización y la presencia de Leprosina A.

Se describieron futuras modificaciones y la introducción de un sistema como método de 
immunoterapia.

THE LARGE MOLECULAR MASS CELL WALL PROTEIN OF M. LEPRAE

S. W. Hunter, P. J. Brennan, M. McNeill, R. L. Modlin,
and R. R. Rubin Colorado State Univ, Fort Collins, 
CO, USA; Univ. Southern California School of Med,
Los Angeles, CA, USA; Albert Einstein Coll. Med, 
Bronx, NY, USA.


and enzymatic methods and photolytic decay with digestion by porcine and patients sensitized to M. 
leprae, three biochemical parameters were used to 
doxyribonucleic acid (DNA) and deoxyribonucleic acid 
of M. leprae. Three biochemical parameters were used to 
determine the presence of DNA and deoxyribonucleic acid 
activity associated with the whole leprosy bacillus.

LIMITED IN VITRO MULTIPLICATION OF MICROBACTERIA LEPRAE

Arvind M. Bhople, Kara J. Green and Linda J. Osborne
Medical Research Institute, Florida Institute of Technology 
Melbourne, Florida, 32901, U.S.A.

Inability to cultivate M. leprae in vitro has been a 
major bottleneck in leprosy research. Today, leprosy bacil-
lus remains the only bacterium causing disease in man 
that has not been cultured in vitro, and until this is achieved, all studies on leprosy will remain at a serious disadvan-
tage compared with other human bacterial infections. 
Studies have been initiated to achieve in vitro growth 
of M. leprae. Three biochemical parameters were used to 
follow the fate of M. leprae incubated in a given medium and 
they are intracellular levels of adenosine triphosphate 
(ATP) and deoxyribonucleic acid (DNA) and uptake of "W-
thymidine. Among the various growth media tried only two 
supported the growth of M. leprae in a limited extent and 
these are (1) modified MHA medium in which Bhople and 
Mark published primary and also sub-cultures of M. leprae-
num, and (2) Nadabav's conditioned medium. After an 
initial 48 hr lag of 4-6 weeks for cell growth, after which 
at least to the other three criteria, was obtained between 14 and 16 weeks. The cells harvested at 16 weeks were inhabitated by a strain typical of M. leprae including DPA oxidase, mouse foot
Further evidence for an extended capsule of pathogenic mycobacteria.

Philip Draper

In ultrathin sections of embedded mycobacteria the peptidoglycan (inner) and lipopolysaccharide (outer) layers of the wall are still clearly visualized. Using special stains, others have demonstrated that additional material, probably carbohydrate in nature, is attached to the outside of the wall, and using antiserum raised against LAM and LM, I have now observed an extended (60 nm) layer of material in this position in Mycobacterium leprae cells able to react with antisera. The presence of similar material on other pathogenic species will be studied, and its nature investigated.

The same experimental technique gives indirect evidence for the shrinkage of the LAM and LM, which, it will be studied, and its nature investigated.

L. Jaganathan, D. Patil and P.R. Mohadevan
The Foundation for Medical Research, Zool, Bombay-400018, India.

Chemotherapy of leprosy is the only tool available to eliminate the disease completely. Drug susceptibility pattern of M. leprae from a patient resistant to DDS and rifampicin, suggesting the feasibility of an extended (60 nm) layer of material in this position in Mycobacterium microti cells able to react with antisera. The presence of similar material on other pathogenic species will be studied, and its nature investigated.

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The influence of associated mycobacteria on the growth and pathogenicity of M. leprae.

Jindrich Kazda
Research Institute for Experimental Biology and Medicine, D-2061 Borstel, Federal Republic of Germany

Mycobacteria other than M. leprae have often been isolated from human and animal leprosy tissue. Cultivable mycobacteria resembling M. intracellulara and M. avium were found together with M. leprae in soil of leprosy endemic regions. When inoculated together in cultivation media, M19 and some other associated mycobacteria enhanced significantly the multiplication of M. leprae in vitro. These cultures retained their pathogenicity in nude mice and in immunobalad armadillos. Furthermore, some of the associated strains enhanced considerably the pathogenicity of M. leprae in nude mice. It resembles in excelleration of foot pad swelling and especially in development of cutaneous leproma after intraplantar inoculation. The associated strains alone were not pathogenic for experimental animals.

USE OF MONOCLONAL ANTIBODIES IN THE IDENTIFICATION OF MYCOBACTERIAL ANTIGENS.

A.H.J. Kelk, R. Gupta, J. de V. Wall, S. Sondj,
J. W. Lowe, E. S. Taijler
Laboratory of Tropical Hygiene, Royal Tropical Institute, Amsterdam, The Netherlands

Specific and cross-reactive monoclonal antibodies against M. leprae, M. tuberculosis, M. kansasi and M. avium are described including a monoclonal antibody reactive with a shared determinant on M. avium, M. intracellulara, and M. leprae. Glycopeptidolipids of M. avium could be identified using an immune thin layer chromatography technique. Eighty percent of the isolates of M. tuberculosis and M. avium cultured from patient material could be identified with a panel of monoclonal antibodies using immunofluorescence. Isolates from M. leprae, M. tuberculosis, M. avium, and M. kansasii could be identified using a Western blot technique and a panel of monoclonal antibodies against these mycobacterial species. The method proved to be useful for the classification of mycobacteria.
may be a cause or an effect of reported disease prevalence.

The paper will address the characteristics of the contemporary uneven distribution of leprosy in a state in S.E. Nigeria, and will consider some of the factors which may have contributed to the prevalence and incidence rates. The role of the distribution of treatment centres in both the pre-sulphone and immediate post-sulphone era, and the collapse of effective control during the Nigerian Civil War will all be assessed.

See also Rev. (1987), 58,1, 60-78

ANALISIS DE LOS REGISTROS DE LEPRA EN ESPAÑA

Dr. Jose M. Carvajal Martinez, Dr. Sergio Carvajal Salguero, Dr. Valentin Martin Gonzalez, Dr. Manuel F. Sanchez Servien, Dr. Pedro Diaz Chavero.

Instituto Leprologico Y Sanatorio Nacional de Trillo. Junta de Cate Castillo la Mancha.

En este estudio se pretende tener una visión de los datos actuales existentes sobre la onda de la lepra en españa y su distribución por las diferentes regiones del país. Así mismo, se pretende llegar a conseguir una aproximación—real al número de enfermos existentes en nuestro país mediante la elaboración—de procedimientos para la adquisición y tratamiento de la información, determinación de procedimientos para la recuperación, organización y difusión de la aislada, así como de su evaluación, y resolver los problemas de estandarización de los registros. Todo esto dentro del marco del actual Sistema Sanitario en los tres niveles de actuación: Local, Regional y Central, con su registro centralizado de los datos.

VIABILITY OF M. LEPRAE IN SOIL AND DEAD ARMADILLO TISSUE AND ITS SIGNIFICANCE

Gilliss W. Luong Johnson’s Disease Center, Carville, LA.

According to a recent study of armadillos killed on the roads of Louisiana, 24% of them showed evidence of lepromatous disease. Up to 10^3 organisms can be present in an armadillo with established lepromatous leprosy. The viability of these organisms and the effect of environmental conditions, means careful study, especially after reports that some individuals with lepromatous leprosy harbored a history of handling armadillos.

In this study it was planned to test the viability of M. leprae left in the soil and in the organs from dead armadillos exposed to ordinary room temperature and humidity, but protected from light. A random soil sample was taken from an area recognized as having a high armadillo population. After autoclaving the sample was inoculated with homogenate prepared from the infected liver of an armadillo previously experimentally infected with M. leprae. A control experiment included placing 100 mg each of M. leprae-infected armadillo liver and skin nodule in sterile culture tubes and storing in the dark at ambient temperature, the viability of the organism in the soil and tissue samples was then determined at different time intervals by using the mouse foot pad technique.

M. leprae were found viable in liver specimens up to 33 days. The viability of liver specimens up to 48 hrs. and in skin nodules up to 3 weeks. Organisms from soil samples were found in footpad isolates up to 33 days.

It is clear from this study that the M. leprae discharged from lepromatous armadillos remains viable in the tissues of dead animals and in the soil. The transmission of leprosy from organisms in the soil is a distinct possibility.

INTEGRATED LEPROSY CONTROL IN THE GAMBIA

Dr. K. Klein Finken and Dr. V. A. Boucher, Leprosy TB Unit, Ministry of Health, The Gambia

Leprosy and Tuberculosis are community health problems which require cooperation of the communities for control of these chronic diseases, which need motivation for their long treatment. In 1957 a vertical leprosy control was effected with many patients registered. There were no record cards for individual patients and no laboratory diagnosis. The work suffered from changes of project leaders and economic problems. In 1979 the country opted for primary health care. The PNC programme is based on "self reliance" for most of its operation. A decentralised regional structure with administrative autonomy from the main health services, provides villages of more than 400 population with a health worker and a TB, whose six weeks training includes leprosy and TB. Medicines are bought from pharmacies and sold by villagers, which serves as a revolving fund. The PNC programme now covers 250 villages. In 1984 leprosy and TB were combined and started to be integrated into the PNC system. Structurally the control programme known three layers:

- peripheral PNC staff, who do case finding, case holding and supervised drug taking,
- technical staff: leprosy TB Inspectors in 15 health facilities, who diagnose—also microscopically— and manage patients. They are supervised by regional control officers.

Central level: referral and coordination at ministry level. The programme uses HDT for both diseases which is issued in compact form for supervised taking. Individual record cards are used to enhance close monitoring.

ENQUETES D'ÉVALUATION PAR SONDAGE DE LA PREVALENCE DE L'ONCLE LEPREUSE EN AFRIQUE CENTRALE.


Après une enquête pilote destinée à tester la méthode et répétée dans l'Ile de Bois (Guinée Equatoriale), le Service d'Épidémiologie et de Statistique de l'OCEAC a mené plusieurs enquêtes en collaboration avec les Services Nationaux concernés, 3 enquêtes d'évaluation de la prévalence dans la dépendance Nord au Cameroun (1983, zone rurale) en République Centrafricaine (1986, zone rurale et urbaine) et au Gabon (1988, zone rurale et urbaine). La méthodologie retenue a été celle du sondage en trentes groupes. Les résultats obtenus sont supérieurs aux chiffres officiellement calculés de juillet 1989 par les Services de lutte contre la Lépre.

SELECTION OF MDT STRATEGIES THROUGH EPIDEMIOLOGIC MODELING

Michel E. Labat, Claire Vulliet, Claude B. Nissou, Mark Vandenbroucke, Etienne Declercq.

The emergence of sulfoxide resistant strains of M. Leprae and the rapid spread of primary resistance has made multidrug therapy (MDT) the backbone of leprosy control. Its introduction is however slow, due to logistic constraints and limited resources. In spite of recommendations by WHO, the selection of target groups to be treated with priority with MDT has been the subject of controversy.

Epidemiologic models are useful to predict the effects of various strategies on the long-term incidence of the
disease. Using the model developed from the Balamthakam database, the effects of MDT and dapsone monotherapy on incidence have been simulated. The reduction of incidence has been studied when MDT is given exclusively either to the multibacillary or to the paucibacillary cases.

The simulations show that treatment of all patients with MDT results in a reduction of incidence of about 90% after 10 years, compared to 55% for patients treated with dapsone monotherapy. They also show the benefit that could be drawn from treating not only multi-, but also paucibacillary cases with MDT.

Besides helping in designing the optimal strategy for paucibacillary cases with MDT, reduction of incidence has been studied when MDT is applied in accordance with the present WRO recommendations. However, as long as these points need clarifying, MDT for leprosy control must continue to be used in accordance with the presently recommended MDT regimens. As demonstrated by a number of multi-drug therapy programmes, it is now possible to reduce the prevalence of leprosy by as much as 50% to 80% in a period of three to five years.

Notwithstanding reductions in prevalence, it should be recognized that other problems will remain for a long time such as disabilities among cured patients and a continued, albeit reduced, incidence of new disease arising from infections caught several years earlier. Hence the need to concentrate on activities such as disability prevention and early detection and treatment through primary health care.

THE GLOBAL LEPROSY SITUATION AND THE IMPLEMENTATION OF LEPROSY CONTROL THROUGH MULTI-DRUG THERAPY

Dr S.K. Noordeen and Dr L. Lopez-Bravo, Leprosy Unit, World Health Organization, Switzerland

The current global situation with regard to leprosy remains serious. While the availability of better technology for leprosy control through multi-drug therapy, as recommended by WHO, has resulted in marked reductions in the prevalence of leprosy, at least in parts of some countries, anthers the situation remains unchanged. However, the overall global figures for registered cases, the number of cases currently under multi-drug therapy and the number of cases registered under MDT show that the situation is improving and that for the first time a downward trend with regard to registered cases is being demonstrated. As demonstrated by a number of multi-drug therapy programmes, it is now possible to reduce the prevalence of leprosy by as much as 50% to 80% in a period of three to five years.

THE TECHNICAL PROBLEMS RELATED TO MULTI-DRUG THERAPY IN LEPROSY CONTROL

Robert Sansarricq, Saint-André, 66160 Narbonne, France

The WHO multi-drug standard regimens for leprosy control have been, or are being, applied to about 1 800 000 patients. The main technical problems faced will be discussed.

- The WHO MDT regimens have proved to be well-accepted by the patients.
- With regard to their efficacy, post-therapeutic relapses in both MB and PB patients have been negligible when observed over periods of one to three years.
- To avoid some MB patients being mis-classified as PB patients, it is now recommended that, for the purpose of MDT, all smear positive cases be included in the MB group.
- Whenever new lesions appear in PB patients who have completed MDT, it is often difficult to distinguish between late reversal reaction and relapse. It is now important to establish the length of treatment needed to eliminate all drug resistant mutants and the relationship between the presence and number of persisters and the risk of relapse after stopping treatment. Based on the answers to these questions, the currently recommended MDT regimens might be modified. However, as long as these points need clarifying, MDT for leprosy control must continue to be applied in accordance with the present WHO recommendations.
During a complete review of all the 105 leprosy clinics from October 1994 through March 1997, only 21 patients with leprosy were found among the 27,675 persons registered, and 25,352 persons (91.6%) could be struck off the registers as they did not show any sign of leprosy. This shows that leprosy control in Northern Nigeria is completely out of control which is blamed mainly on the poor registration and the complete lack of supervision.

However, it seems to be a tremendous decline in the leprosy epidemic as the prevalence came down from 39/1000 in 1952 to 1.5-2/1000 in 1997 which in the author’s opinion is caused by the natural course of the epidemic and by a change in the socioeconomical conditions. So, as stated by the WHO and UNICEF, this question still has to be solved.

Even with this low prevalence there are thousands of leprosy patients who need some kind of help. An outline is given of what should be done whereby it is stressed that AFR can be implemented only following a total and complete upgrading of the leprosy control system, especially the documentation and the supervision in the field.

**FP 103**

*M. leprae* induced suppressor cells in the polar clinical forms of leprosy: Del Carmen S. Casiain, Silvia de la Barra, R. Valdez, L.M. Balnica, E. I. Koba, Academia Nacional de Medicina, Buenos Aires, Argentina.

*M. leprae* induced suppression of T cell proliferation was studied in peripheral blood mononuclear cells (PBMC) from leprosy patients belonging to the different clinical forms, patients were classified according to Ridley and Jopling: TT (n=12), BT (n=7), BB (n=4), BL (n=9), LL (n=23) or LL-PBMC to develop suppression upon *M. leprae* challenge was ENE, 15+; a tissue culture medium as controls (C). In the second stage lower in LL patients than in the other clinical groups and that had been frozen at -80°C. 111A or Con A were used as mitogen in PBMC with 800 mg/day PEFLo from day 7 to day 60.

**FP 104**

Monitoring of PGLI antigen and antibodies levels in multibacillary leprosy patients treated with ofloxacin or pefloxacin.


Institut Louis Malardé, BP 30 Papette, Tahiti

Recent studies, confirmed by our personnel data, showed that conversely to antibody level, the concentration of PGLI antigen in the sera of MB patients decreased rapidly after multi-drug therapy (about 90% in two months). These results suggest the usefulness of this test to assess the bacterial viability and the effectiveness of a chemotherapy. Among the new fluorquinolones, Ofloxacin (OPLo) and Pefloxacin (PFPLo) are effective against *Mycobacterium leprae* in the mouse model, and first trial on MB patients using PFPLo was promising. Consequently, a pilot trial to compare the activity of OPLo and OPLo in conducted in Ivory Coast under the WHOThelpe auspices: 16 previously untreated MB patients are orally treated at day 0 with a loading dose of 800 mg OPLo or PFPLo, then either with 400 mg/day OPLo or with 400 mg/day PFPLo from day 2 to day 57. 1 (Suppl.)

**FP 112**


Considerable progress has been made in expressing mycobacterial genes in E.coli. We have concentrated on one such gene, that encoding for the 65kDa protein of *M. leprae*. This protein has been subcloned into a high expression system in E.coli and Prop. In vivo, the mycobacterial protein isolated and purified after this recombinant product we have studied T-cell mediated response of *M. leprae*-immunized mice, and confirmed that the 65kDa protein is a major immunogenic protein in such mice. We have also studied the role of the 65kDa protein in protective immunity against *M. leprae* footpad infection. Finally we have constructed suitable restriction fragments of the gene and cloned these such that they are expressing a series of overlapping peptides; these constructs are being used to map both T-cell and protective epitopes on the 65kDa protein.

**FP 113**

Reduced numbers of Leu 1+ cells in peripheral blood of lepromatous leprosy patients. Ines del Carmen S. Casiain, Silvia de la Barra, R. Valdez, L.M. Balnica, E.I. Koba, Academia Nacional de Medicina and Hospital Argerich, Buenos Aires, Argentina.

We have shown that suppressor cell function is poorly induced in Leu 1+ cells by peripheral blood mononuclear cells (PBMC). Recently, the role of suppressor inducer cells in the generation of effective suppressor cell function was recognized and these cells were shown to react with the Leu 8
monoclonal antibody (96b-1) we evaluated Leu 8(+) cells in LL patients, tuberculoid leprosy patients (TT) and in BCG-immunized normal controls (N).

The proportion of Leu 8(+) cells was 51.3 +/- 1.5% in TT; 51.25 +/- 1.4% in N and only 19 +/- 7% in LL. The proportion of Leu 8(+) cells did not change in TT or N, but were culture with M. leprae for five days, with PMA (72 hr) or Con A (96 hr) in LL patients undergoing the etiology nodules (ENL) the number of Leu 8(+) approached that of TT and N individually, suggesting that their had may be mediated by the inflammatory process. Fractionation of T and non-T lymphocytes by negative selection revealed that the defect of Leu 8(+) cells was restricted to Leu 8(+) T cells in LL (62 +/- 1.5%, 54 +/- 1.7%, 54 +/- 1.6%) as the proportion of Leu 8(+) non-T cells in this group was similar to TT and N (61 +/- 1.1%, 56 +/- 1.1%, 58 +/- 1.6%)

We suggest that the inability of M. leprae antigens to induce suppressor cell function in LL patients is related to the low numbers of Leu 8(+) T cells and may be an important factor involved in their inability to cope with the microbial agent.

**FP 114**

The contribution of IMMLEP to recent advances in immunology and molecular biology of M. leprae


The goal-oriented collaborative research programme of the Scientific Working Group on Immunology of Leprosy (IMMLEP) under the WHO/World Bank/WHO Programme for Research and Training in Tropical Diseases (TDR) continues to make progress. The IMMLEP programme is directed towards three major objectives: (I) development of an anti-leprosy vaccine as a means of primary prevention, (2) development of improved methods for monitoring specific cellular and humoral immune responses to M. leprae and 3) delineation of the immunopathological mechanisms underlying tissue damage in leprosy, including nerve damage. The IMMLEP research plan has provided a basis for the global distribution of animal-derived M. leprae for laboratory studies and use in man; for the development, characterization and distribution of monoclonal antibodies used for the identification of M. leprae and specific antigenic determinants; and the establishment of worldwide distribution of an M. leprae gene bank.

A major development in leprosy epidemiology has been the screening of vaccine trials in Venezuela and Malawi, both using heat-killed M. leprae vaccine provided by IMMLEP. In addition to investigating the possibility of leprosy control by vaccination, these trials provide important population laboratories for a broad range of epidemiological studies, including the development and testing of field applications of tools for elucidating the pattern and determinants of M. leprae-induced infection and disease.

The development of a second generation leprosy vaccine will depend upon ongoing structural studies, success in genetic manipulation of mycobacteria and intensive work on an international model. Additional advances in immunobiology, including the delimitation of T cell subsets, lymphokines and MHC genes will also contribute to better understanding of the immunopathogenesis of leprosy.

**THE COMPLEMENT PROFILE IN LEPROSY**

In Romeing and N. Roye et al, Municipal Hospital, Limpopo, China

The results of determination of Cl, C4 and B factor and the hemolytic assay of the alternative complement pathway (ACP) in 67 BU, 8, II, T, TT leprosy patients sera are presented.

In the 47 BU, 8 T and T sera were qualitatively and quantitatively immunofluorescent, while + CP sera was detected with nucleated rabbit red blood cells.

The findings suggest that the level of complement component depends upon the type of leprosy. Severe immunofluorescence of Clq and C4 factor is significantly lower, but PC-FDI is higher in BU and T patients. In these cases the depressed levels of complement components reflect the activation of classical and alternative complement pathway. The elevation of PC-FDI may be the result of acute systemic disease. It is postulated that immune level may be used as an indicator of clinical type, treatment and prognosis in leprosy.

**FP 115**

DETECTION OF A SPECIFIC MYCOBACTERIUM LEPRAE ANTIGEN IN THE URINE OF LEPROSY PATIENTS

Anne C. Mahon, Ayenew Hurlign, Bizuayehu Kebede, Marijke Beck and Maurice Lefford

Armauer Hansen Research Institute, P.O. Box 1005, Addis Ababa, Ethiopia, ALERT Leprosy Control, Addis Ababa, Ethiopia and Wayne State University, Detroit, USA.

A dot-ELISA test for detection of the M. leprae antigen, phenolic glycolipid-1 (PGL-1) has been previously reported. We have tested the assay in a population of patients who report to ALERT leprosy control field clinics and to the ALERT hospital in Addis Ababa, Ethiopia, to determine if the test accurately reflects the disease state of leprosy patients. The urine from more than 200 individuals was assayed, and the PGL-1 content was determined by comparison to individuals of known quantity. Our results show that the PGL-1 dot-ELISA test can detect as little as 5 ng of PGL-1 in the urine. There is a correlation in the levels of PGL-1 with disease status, with multibacillary BU and LL on the Ridley-Jopling scale) patients having the highest levels of PGL-1 in the urine. Approximately 90% of the LL patients tested were positive in the dot-ELISA, while 55% of the patients were positive. After the onset of multidrug therapy, there is a rapid decrease in the levels of PGL-1 in the urine with PGL-1 levels in highly positive individuals becoming undetectable after three to six months chemotherapy. The usefulness of this assay to monitor treatment of leprosy in multibacillary patients and for early case detection is being investigated.

**Page 327**

**SELECTIVE COATING OF MYCOBACTERIUM LEPRAE SURFACE ANTIGENS BY SPECIFIC MONOCLONAL ANTIBODIES AND ITS EFFECT ON PHAGOCYTE-LYSOSOME FUSIONS IN M. LEPRAE-INFECTED MACROPHAGES**

Philippe Sabin and Claude Fréhé, 1. Unité de la Tuberculose et des Mycobactéries and 2. Unité de Microscopie Electronique, Institut Pasteur, 75724 Paris Cedex 15, France.

Mycobacterium leprae has been recently reported to induce phagosome-lysosome fusion (PLF) in infected macrophages, which is one of the main defense mechanisms by which both M. tuberculosis and M. leprae survive intracellularly. However, with M. leprae this inhibition was only evident during the early steps of infection.

We previously also established that coating of M. leprae by specific antisera prior to phagocytosis reversed the early PLF inhibition (1). In the present...
work, we investigated the effect of coating of M. leprae surface components using anti CD4* subpopulations, in BT lesions 90% were CD8* ( helper cells), CD40* (T-suppressor inducer cells), CD8*9.3* (T-cytotoxic cells) and CD49.3* (T-suppressor cells) were studied with monoclonal antibodies using single and double immunoperoxidase staining of frozen sections and FACS IV sorting of double stained lesion sections and FACS IV sorting of double stained lesion sections. Of CD4* subpopulations, in BT lesions 75% were CD8*9.3* (T-cytotoxic cells) and 25% CD8*9.3* (T-suppressor cells) both were restricted to the lymphocytic mantle about the epithelioid tubercle. As described by Collins et al., three clones were frequently encountered that react directly with the detection reagent in the absence of antibody. The products of these clones are thought to be mycobacterial proteins that are not only expressed but are successfully biotinylated in the foreign host (Collins et al, 1987). Three clones were isolated from a gt11 library of M. leprae: the insert structure of all three was the same. Western analysis showed the presence of a biotinylated protein of 85kD, the same size as that identified in BCG clones previously.

A similar phenomenon was noted with one of the clones described by Young et al (1985): gt11 clone Y3184 expresses a presumed fusion protein (116kD) that is detected in the absence of antibody and therefore is likely to be a biotinylated protein.

References:

Analysis of Mycobacterial Ribosomal RNA

Study of ribosomal RNA sequences provides valuable information on taxonomic classification of organisms, which can also be extended for the construction of labelled hybridisation probes which can detect small numbers of bacteria and distinguish between genera and species. With the development of such probes in mind, molecular relatedness among Mycobacterium leprae isolates defined using recombinant DNA probes.

Josephine E. Clark-Curtiss, Washington University, St. Louis, MO U.S.A.

Insert fragments from 14 recombinant DNA molecules, selected from genomic libraries of Mycobacterium leprae DNA have been used as probes in Southern hybridisations with restriction endonucleases-digested total chromosomal DNA from four different isolates of M. leprae. The M. leprae isolates were from human leprosy patients in India a naturally infected armadillo from the U.S., and a naturally infected Mungape monkey from Africa. Chromosomal DNA preparations were totally digested with six different restriction endonucleases prior to electro- phoretic separation of the fragments and transfer of the to nitrocellulose filters. Hybridisation experiments demonstrate essentially complete identity among the genomes of the M. leprae isolates, indicating a remarkable conservatism of genomic sequences.
we have determined partial nucleotide sequences of the 16S rRNA of Mycobacterium leprae and other recombinant species by primer extension. Regions of the M. tuberculosis operon representing the 5' end of the 16S and 23S rRNA have been cloned and sequenced; completion of these data is expected in the near future. The M. leprae operon is also being cloned prior to sequence analysis. Southern blot analysis of the M. tuberculosis genome using labelled total RNA and the two cloned regions has shown the existence of a single rRNA operon in this species, for which restriction enzyme cleavage sites have been mapped. Southern blot analysis has also shown a high degree of conservation within the RNA operon of a number of strains of M. leprae, and that M. microti is very closely related to M. tuberculosis.

The high copy number of rRNA rRNAs, and the existence within them of sequences which are specific to bacterial genera or species tenders them attractive for the development of sensitive hybridisation probes for detection of bacteria within mammalian tissues. We have constructed an oligonucleotide which is complimentary to one of the most widely conserved regions of the bacterial 16S molecule and demonstrated its ability to recognise this rRNA isolated from a range of bacterial genera and species including M. leprae. The probe has been shown not to recognise the equivalent rRNA of eukaryotic species. We are using this probe in a fruitless manner to investigate the ability of this probe to detect and quantitate the presence of small numbers of bacteria in tissues.

Expression, purification and immunologic activity of recombinant Mycobacterium leprae proteins.

Thomas P. Gillis and Diane L. Williams, Laboratory Research Branch, Gillette Long National Institute for Medical Research, London, UK.

Recombinant lambdoid plasmid 11 lysogen of E. coli TG109 and p223-3 and p218 transformants of E. coli TG203 and MG1655, respectively, were developed and analyzed for production of the recombinant Escherichia coli 38K protein of M. leprae. Recombinant lysogens were produced in E. coli TG109 with lambda plasmid 11 clone 1912, which encodes the gene for the M. leprae 45K protein. Results showed that all lysogens tested produced 65K-40K low but detectable amounts an antibiotic using immunostaining using monoclonal antibody (MAb) against the native M. leprae protein. Equivalent amounts of 38K cells (transformed with the expression vector p223-3), containing a 4.4 kilobase (kb) EcoR fragment from 1912, produced significantly greater amounts of 65K-40K.

E. coli TG203 transformants were developed using the pUCl8 vector, containing a 2.9-kb EcoR fragment derived from the 3.5-kb EcoR fragment of 1912. Under optimal growth conditions the pUCl8 transformant produced the largest yield of cells containing the recombinant protein. The 38K protein was detected in SDS-solvable fraction, extracted from an insoluble bacterial fraction, harvested by centrifugation after lysozyme-DIDTA treatment and fractionation by high pressure. Immunologic activity of the recombinant protein was observed in SDS-gel electrophoresis and dot blots. Both the M. leprae antigen expression and recombinant proteins in the native and recombinant protein, further investigation of the immune response to these two proteins in other animals and humans should help define the significance of the immune response to these molecules in infection with M. leprae.

Expression of heterologous genes by lysates of Mycobacterium leprae MG1655.


The proposed use of mycobacteria, in particular M. tuberculos, SGs, as agents for the construction of multiple vaccines requires the development of cloning vectors which will express a variety of immunogenic foreign gene products in these organisms. The means by which expression of heterologous genes is achieved will depend on the ability of mycobacterial transcription and translation mechanisms to recognise the control signals present in the sequences of these genes. It is possible that mycobacterial expression vectors will also have to be constructed which will be unable to express very large quantities of its gene product by cultivation in the presence of the substrate acetate. We have purified the antigen for detection of partial amino acid sequence, and from these data we will design an oligonucleotide to identify clones containing the gene. We will then study the properties of the promoter, which has obvious potential in the design of regulatable mycobacterial expression vectors.

Construction of genomic library of Mycobacterium leprae gene and its expression in Streptomyces lividans.


Research Institute for Microbial Diseases, Osaka University 3-1 Yamada-oka, Suita, Osaka, Japan.

Shuttle vectors which can replicate both in Escherichia coli (E. coli) and Streptomyces lividans (S. lividans) were constructed. By using one of these vectors, pSN493, genomic library of Mycobacterium leprae (M. leprae) was inserted into E. coli. Using a thousand-fold enriched DNA transformant colonies carrying the recombinant DNAs were picked from the selective plates. Because the average size of the DNA ligated into pSN493 was 2 kb base pairs (kb), the library should cover most of M. leprae genome. The recombinant plasmids were introduced into S. lividans by protoplast transformation, and the expression of the M. leprae genes in S. lividans was examined. By Western blotting experiments, extracts of 19 out of 66 S. lividans transformant colonies were stained positive with specific anti-M. leprae serum. Two of these reacted with a monoclonal antibody specific to the M. leprae 65-kDa protein. These results indicate that many M. leprae genes were expressed in S. lividans. This system may be useful for cloning and the expression of M. leprae genes.
plasmid vectors, and also electrophoresed, and Southern blotted onto membranes. Radiolabelled recombinant clones were hybridised to membrane-bound DNA and the filters autoradiographed. M. lepraederived clones were found to hybridise strongly to M. leprae DNA but only very weakly to DNA from a range of mycobacteria, indicating that M. leprae is only distantly related to these mycobacteria. A clone encoding an insertion sequence found in the genome of Mycobacterium paratuberculosis was found to hybridise to M. leprae DNA, indicating that M. leprae may have insertion sequences in its genome.

Overproduction and purification of Mycobacterium leprae 65kD Protein in E.coli

Toshiro Tomita, Hiroko Nakaka, Masahiko Matsuoka, et al.

A new plasmid vector (pASN8) was created to enable expression of the authentic protein from Streptomyces lividans cloned in Xgt11. Experiments to secrete the 65kD protein fused to a 2kD peptide containing six histidine residues resulted in extremely low yields, presumably due to proteolysis. A new plasmid vector (pASN+) was created to overcome this problem using the observations of Higashimurayama City, Tokyo, 189 Japan.

The gene encoding an 18kD protein from M. leprae, cloned and expressed in E.cell as a 6-galactosidase fusion by Young et al. (1985), was purified for immunological studies. However, antigen-specific T cell response to the 8-galactosidase portion of the fusion protein was not detected in the absence of multiplication of M. leprae DNA into the vector pUC8-2, so that the 18kD protein was fused only to a 2kD peptide, resulting in extremely low yields, presumably due to proteolysis. A new plasmid vector (pASN+) was created to overcome this problem using the observations of Gunz et al. (1986), with the foreign protein fused to a 4kD peptide containing six consecutive asparagine residues. A dramatic increase in the yield of recombinant protein resulted, and the protein has been purified for use in T cell studies. It is hoped that this vector will be of general use for genes cloned in E. coli. Experiments to secrete the authentic protein from Streptomyces lividans are in progress.


ABBS test have shown this to be the most sensitive and highly specific test for detection of M-leprae specific antibody. A follow-up study has been carried out using FLA-ABS test in 1426 healthy contacts of multi- and paucibacillary leprosy patients. Simultaneously lepromin testing has also been done to determine their delayed type hypersensitivity. In more than 6 years of follow-up, 36 contacts have time-up disease and of those 33 contacts were FLA-ABS positive and lepromin negative. Thus the test (alongside lepromin) can be used to identify the contacts who are at higher risk of developing the disease. FLA-ABS test has also been found to be highly sensitive for detection of subclinical infection specially in younger age group. This test could be a very sensitive epidemiological tool for monitoring the occurrence of disease especially after MDT and other intervention measures.

FP 134
An epidemiological study on leprosy in southern Taiwan.

Peng Chou, Pao-yeng Tsai and Boi-Hong Kong
Institute of Public Health, National Yang Ming Medical College, Taipei, Taiwan.

One hundred and fifty-seven leprosy patients of two clinics in southern Taiwan were interviewed with questionnaire and examined with disability grading scale. Their clinic charts were reviewed and summarized. A total of 36.9% of patients had family history of leprosy. The underreporting of patient number in the family was found in interview. The disability index was increased with the households. The zero bacteria index was increased from 22.3% at first diagnosis to 40.6% at present. Most patients were treated with Tripamine at first diagnosis and with multiple drug therapy at present. The proportion of irregular treatment was enhanced during 1969 to 1978. The average time lag between the clinical sign and confirm diagnosis was 3.7 years. 51.6% of patients had family history of leprosy. With multiple logistic regression analyses, the family index was influenced by "drug usage" while the "regular treatment" was influenced by both the "drug usage" and "the time is not available".

THERAL - URBAN PARADOX IN LEPROSY
Paul E. M. Fine, Joon M. Poonissaha, and Nick Maine
London School of Hygiene and Tropical Medicine, Department of Tropical Hygiene, Keppel Street, London WC1E 7HJ; and
Lepra Evaluation Project, PO. Box 46, Chilumba, Karonga District, Northern Malawi, Central Africa.

There are many indications in the literature that leprosy is more common in rural than in urban environments. This is of interest lessar as Mycobacterium leprae infection is generally attributed to "contact" with infected persons and crowded conditions are generally thought to predispose to contact infections. Appropriate comparisons between rural and urban environments are made difficult by the many social, economic and demographical differences between such populations. By migration patterns between them and by the different logistical problems involved in studying them. We have explored this problem using data from a total population survey in the Lepra Evaluation Project in Karonga District, Northern Malawi. The prevalence rate of leprosy was found to be inversely related to the population density per square kilometre in this predominantly rural area, an effect which was found to be statistically highly significant (p < 0.001) after controlling for age, BCG scar status and ecological zone within the District. Subsequent analyses have attempted to explain whether this pattern is attributable to higher incidence rates in less populated areas, to different migration patterns, or to longer disease duration in rural areas. Preliminary results have identified the prevalence rate of multibacillary disease as a significant risk factor for leprosy incidence, independent of population density. The implications of these findings for the natural history of leprosy will be discussed.

FP 136
OPERATIONAL EFFICIENCY OF PARAMEDICAL WORKERS IN LEPROSY SURVEY: A TIME MOTION STUDY.

Anshuk Kumar, P. Strumman and K. Durganmal.
Division of Epidemiology & Statistics, Central Leprosy Teaching & Research Institute, Chengalpattu-603 001, Tamil Nadu - India.

To estimate the Leprosy Survey Target and Optimal Efficiency of PMWs, this study was undertaken in two Leprosy Eradication Project Areas of Chengalpattu District, of the total 445 families (2353 persons) surveyed by the 14 PMWs in 23 man-days, 184 families were randomly observed to study the survey efficiency of these workers.

It was noted that on an average a PMW had spent a total of 8.11 ± 0.34(mean ± SE) minutes in different survey activities at one family, namely self-introduction (0.23±0.01 min.), briefing purpose of visit (0.25±0.02 min.), collecting family particulars (1.66±0.20 min.), family examination (2.36±0.14 min.), recording family survey results (0.55±0.54 min.) and leprosy health education (0.66±0.06 min.). It was estimated that during 4 hours of effective survey work between 6.00-10.30 AM, one PMW could conveniently cover 21 families (117 persons) and examine 71 individuals in one day. However, retrospective analysis showed that a PMW surveyed only 12 families (66 individuals) and examined 51 persons in a day, i.e. 57% & 72% of the expected efficiency in coverage and examination, respectively.

The detailed observations and various factors found to be influencing the survey efficiency of PMWs will be discussed.

FP 137
LEPROSY CONTROL THROUGH MULTI-DRUG THERAPY USING PRIMARY HEALTH CARE APPROACH
Dr. L. Longchamp and Dr. S.K. Naoroji, Leprosy Unit, World Health Organization, Geneva, Switzerland

The concepts of primary health care (PHC) and leprosy control through early case detection and treatment through specialized services have evolved independently over the years with only limited complementarity. While multi- drug therapy (MDT) in its early days was considered too complex for implementation within PHC, recent experiences suggest that this may not be true. The need to increase coverage of MDT is reinforced by possibilities of rapid reductions in the prevalence of leprosy combined with positive experiences with MDT relating to low frequency of side-effects, high levels of acceptability, increased compliance for treatment, reduced stigma, increased self-reporting by patients and low rates of relapse.

The need to make full use of PHC services to increase coverage of MDT is stressed. The approach of integration does not imply total disappearance of specialized elements but their incorporation into general health services depending on the local situation. Disease awareness in the community and community participation are very important for successful leprosy control and the PHC approach provides excellent opportunities for this. The critical element in successful integration is training of health workers at all levels and inclusion of leprosy teaching in medical and other health training schools.

FP 138
Comparative Epidemiological and Operational Assessment of MDT and an Integrated Test Control Program.
Co-operation between voluntary organisations and primary health care, as well as the professional leprosy worker

The efficacy of M.D.T in almost achieving the envisaged objectives of leprosy control within five years and also helps for integration with general health services

Hence M.D.T is a very effective tool in Leprosy Control Programmes.

The epidemiological impact of Multidrug Therapy (MDT) in the Leprosy Control Programme in Gudiyatham (Madras) was measured in a sample of about 35,000 population through annual examinations during 1982-87. MDT was introduced in the peripheral area in 1982.

The incidence rate (number of new cases arising per year out of previously examined normal population) was 1.46/1000 during 1982-84 and declined to 0.85/1000 in 1985-87, showing a 49% reduction. The profile of new cases is described.

The incidence rates among household contacts of MB and PB cases under MDT are also shown. Although it is rather early to confirm the declines in incidence, there are hopeful signs of controlling transmission of leprosy through MDT much earlier than that noticed under monotherapy.

This trial is supported by the UNICEF/WHO Special Programme for Research and Training in Tropical Disease.
system deformity/disability prevention through locally organised Therapeutic Core Groups. Both in content and thrust, the paper argues, this would mean more sustained roles for "own groups."

**THIRD OF LEPROSY**

**IN GUYASAM CONTROL UNIT (MACHARNTHA : INDIA)**

TARE, G.R.

Candid Memorial Leprosy Foundation
PO: HINDINDAGAR, 442 003, WARDHA (INDIA).

Sevagram Control Unit is the oldest Unit in India established in 1951 for control of leprosy based on annual active screening of entire population, out-patient treatment of all detected leprosy patients with monotherapy (till 1978) and multitherapy (since 1978). The population covered was initially 10,647 and presently 22,764 living in 267 Villagess. Hereditary education has been conducted extensively for the community.

The Paper discusses the methodology of work, and modifications introduced based on experience gained, from time to time. The Unit has the advantage of having steady personnel: medical and paramedical during the last 35 years. Major indices for leprosy control, prevalence, case-detection rate, type-ratio, age and sex distribution, and rate of arrest have been worked out for 25 years and discussed in the paper. The change in attitude of society towards leprosy and its sufferers, as evidenced from social acceptability, decline in social dehabilitation and vocational displacement and absence of instances social estration/harrassment is also discussed in the paper.

**Immunodermatological studies of a hyperendemic pocket in a low endemic zone.**

M.V. Yellapurkar and M.C. Valiya
National Leprosy Eradication Programme Consultant, Pune, India.

Malwa a town with a steady population of about 17000 has been showing a high prevalence of leprosy over years (12 per 1000 in 1983), whereas the district PR in 1.5 M.T. has brought down the PR to 3.2 in 1988. But the high I.G. incidence continues unabated. All new cases are indigenous.

Immunodermatological studies have been taken up in 1985 to find out the cause of such hyperendemcity. The studies are still going on. The interim findings are given.

The stimulatory index of lepromatous group (untreated or treated for less than 6 months) shows a decrease with all types of treatment. The ratio of suppressor to helper in lepromatous group is about 0.49 as against 1.79 and 1.25 in healthy contacts and tuberculoid patients tested.

**EXPERIENCES IN LEPROSY CONTROL IN A DEVELOPING COUNTRY**

Le Kien Du, Nguyen Nguyen et al.
National Institute of Dermatology, Hanoi, SR Vietnam

After a thorough analysis of epidemiological data, social and psychological factors of the leprosy situation in Vietnam, a programme of leprosy control has been developed, which would be feasible even in difficult socio-economic conditions. Based on a 30 year experience and an eradication trial carried out from 1974 to 1984 in the pilot district NGA 508 with leprosy prevalence of 1.5 per 1000, the authors have emphasized the possibility of a programme leading to leprosy eradication in a phased manner, starting in areas where the following conditions are met:

1. awareness and determination of administrative and health authorities.
2. upgrading literacy rate and hygiene standards of the population.
3. organizing a network of leprosy control services, priority being given to communal/village level.
4. establishment of a multisectoral committee for promoting and supervising the programme implementation.
5. adoption of an effective and progressive method for various leprosy activities.

Preliminary results of the "Leopard-skin eradication programme" of leprosy in Vietnam have been presented in conclusion.

**ANALYSES OF LEPROSY INCIDENCE IN 226 DESCENDANTS OF LEPROSY PATIENTS**

Shi Puqinping, Yang Kelela, Li Mei and Yu Ancin,
Municipal Institute of dermatology, Dalian, China

The analysis of leprosy incidence in 226 descendants of leprosy patients indicates that the sulphone drugs have had a good protective effect on the leprosy incidence in the descendants of leprosy patients. The use of combined chemotherapy should result in better achievement. The incidence in the descendants, who were born before their multicellular HBe antigen patients were treated with sulphone drugs, was 2.74%, 0.04%, and high with M. lepros. The lepromatous group (both treated and untreated) showed a tendency of decreased lymphocytic response when compared with healthy contacts and tuberculoid patients.

The untreated lepromatous group showed an increase in cutaneous level at 26 years. M.B. for 3 years fail to display an increase (17.8 UF/100 ml). There is no such significant change in cutaneous level in treated lepromatous, in the healthy group treated and the tuberculoid patients.

The ratio of suppressor to helper in lepromatous group is about 0.49 as against 1.79 and 1.25 in healthy contacts and tuberculoid patients tested.

**SAMPLE SURVEYS IN LEPROSY:**

**MILESTONE FOR INDONESIA**

A.A. Louwana, M. Zuidhoffoek, G. Suwono, A. Declevare and M.F. Lechat
Div. of Leprosy Control, DDI, Jakarta, Indonesia

The analysis of leprosy incidence in 226 descendants of leprosy patients indicates that the sulphone drugs have had a good protective effect on the leprosy incidence in the descendants of leprosy patients. The use of combined chemotherapy should result in better achievement. The incidence in the descendants, who were born before their multicellular HBe antigen patients were treated with sulphone drugs, was 2.74%, 0.04%, and high with M. lepros. The lepromatous group (both treated and untreated) showed a tendency of decreased lymphocytic response when compared with healthy contacts and tuberculoid patients.

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The ratio of suppressor to helper in lepromatous group is about 0.49 as against 1.79 and 1.25 in healthy contacts and tuberculoid patients tested.
In 1975 the Department of Health of Indonesia recognized the importance of gathering and analyzing reliable epidemiological information to ensure monitoring and evaluation of the leprosy situation.

For that purpose 20 sample surveys have been carried out on a nation-wide basis, using a system of cluster sampling, recommended by WHO. The results were processed by computer and identified the foci of leprosy and the potential case-load. They also revealed interesting indicators as the children-proportion and disability-rate among newly detected cases, the disability-rate as a whole, and many others. It became also clear that the highly endemic province of Sulawesi was a main source for the spread of leprosy to other provinces.

The knowledge obtained enabled the government to build up an effective control system and to secure additional financial assistance from foreign agencies. In Sulawesi an evaluation survey in 1985, as a follow-up of a sample survey, executed 10 years before, revealed a statistically significant decrease in estimated prevalence from 13.3 to 7.1 per thousand.

This paper intends to show that sample surveys as a follow-up of a sample survey, executed 10 years before, revealed a statistically significant decrease in estimated prevalence from 13.3 to 7.1 per thousand. The knowledge obtained enabled the government to build up an effective control system and to secure additional financial assistance from foreign agencies. In Sulawesi an evaluation survey in 1985, as a follow-up of a sample survey, executed 10 years before, revealed a statistically significant decrease in estimated prevalence from 13.3 to 7.1 per thousand.

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At the time the pilot units were implemented, it was decided that more than one unit would be set up in those states or territories where they would be most effective.

The program started with training for the "main fitting" of the H.C., consisting of Doctors, Nurses, Field Workers and Lab Technicians, followed by a routine three monthly meetings. The program started with training for the "main fitting" of the H.C., consisting of Doctors, Nurses, Field Workers and Lab Technicians, followed by a routine three monthly meetings. The program started with training for the "main fitting" of the H.C., consisting of Doctors, Nurses, Field Workers and Lab Technicians, followed by a routine three monthly meetings.

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The usefulness of the intradermal test to monitor the effectiveness of chemotherapy is discussed in the present paper. This paper is the first to suggest the use of the ratio of relapse cases as a measure of the state of disease control. The usefulness of the intradermal test to monitor the effectiveness of chemotherapy is discussed in the present paper.
The magnitude of the modifications of the intradermal response induced by different vaccines and their persistence in Tuktu was confirmed.

The Venezuelan trial confirms that the intradermal reactivity varies according to different risk criteria involving in the incidence of the disease: thus, the cutaneous reactivity is significantly higher in household contacts than in non-household ones. In addition, significant differences were observed when comparing age groups with the cutaneous test, specially in those critical groups 6-11 years old in relation to 12-19 and 20-29 years old.

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Fourty-five skin smear positive lepromatous patients treated first with rifampicin and later with ofloxacin were biopsied and their bacilli recovered and inoculated into the footpad of normal mice to obtain the multiplication of any surviving organisms. Growth was only observed in the animals infected with the M. leprae from 3 of the patients. The isolated strains were tested to check for susceptible to dapsona and rifampicin. One strain was resistant to dapsona at 0.0001% concentration of the drug in the diet and susceptible to the two concentrations of rifampicin used. A second strain was fully susceptible to both drugs and the third one failed to multiply when a passage was attempted to enrich the strain. The persistence of viable acid-fast bacilli after the rifampicin course of the dapsona resistant strain caused the relapse of the patient, whereas the bacteriostatic effects of ofloxacin seem to have been able to arrest the multiplication of parasites in the other case.

**MULTIPLE THIQD THERAPY IN ZIMBABWE**

Bob O. Matemba

Leprosy control was disrupted during the liberation struggle which led to independence in 1980. In January 1985 the National Leprosy Control Programme initiated country-wide control measures based on the W.H.O.-recommended Multiple Drug Therapy, covering almost 100% of the 3200 detected cases. Multibacillary patients were treated for 24 months only. Patients were followed up by three- to six-monthly full clinical assessment. Investigations included a research study on the value of serum IGM Ab-levels in classification.

The study discusses the results of the control programme after 18 years of follow-up in terms of rates of compliance, relapses, reactions and other complications, as well as the outcome of the research study.

**WHO REGIME IN YALAMASSA PROVINCE, EAST INDONESIA**


Leprosy Laboratory, Institute Tropical Medicine, Antwerp, Belgium.

The evaluation of the therapeutic value of treatment regimens in MB leprosy should be based on the incidence of relapses. To define the duration of follow-up after the end of therapy it is of primary importance to know when relapses do appear. It is sometimes said that after treatment with rifampicin (RMP) containing regimens the incubation time for relapses is longer than after DDS monotherapy. We have observed 52 relapses in several groups of patients who had taken RMP: (1) old MB pts B10 after long duration DDS treatment who had received one final dose of RMP (2) pts who had participated in studies on combined RMP containing regimens for MB leprosy.

Results: two groups of relapses: early ones occurring within 3.5 yrs, median 2 yrs; and late relapses more than 4 yrs after stopping treatment. The first are thought to result from insufficient treatment, the second from re-multiplying persisting organisms.
MEDIATED mechanisms. Destruction of nerves is thought to occur either as a result of DTH to bacterial antigens or through autoimmunity. These conclusions have been corroborated further in the mouse model by the study of (i) perineurial and blood vessel involvement and subsequent nerve damage, (ii) modulation of nerve damage with anti thy1.2 (iii) adjuvant like action of M. leprae.

The features of many of these early changes do not resemble immunologically based conditions such as EAN. Rather, they mimic those of chronic nerve disease, suggesting a permanent axotomy model. Thereby they strongly implicate both physical factors and neuroepithelial interactions as the key pathways for triggering nerve damage.

Even with modern chemotherapy, sensory and muscle nerve involvement and subsequent deformity continue to be a part of Hansen's disease. Most leprosy control programs monitor patients from the standpoint of immunological control, and disability grading. Few measure actual peripheral nerve status, and changes in status. Recognition and treatment of peripheral nerve problems in Hansen's disease are problems while at an early stage hold the potential to reduce or prevent further nerve involvement, and to arrest progressive deformity and disability. A hand screen evaluation was developed to assist the physician, therapist, nurse, and health technician to recognize, classify, and refer for treatment patients with peripheral nerve involvement and changes in nerve status. It is important the health professional and health worker understand peripheral nerve involvement as the underlying cause of deformity in the disease, so that deformity can be prevented, and not just treated.

The hand screen evaluation has been used to monitor in patients and out patients at the Gilliss W. Long Hansen's Disease Center, Carville, LA USA for the last 3 years and in the United States Hansen's Disease Regional Care Facilities. In a preliminary study, 449 patients were reviewed to identify peripheral nerve involvement in a 2 year period. Preliminary and current test results are reported. Results indicate a higher number of patients have nerve trunk involvement than is otherwise expected. More than half of the patients in the preliminary study changed in a 2 year period. Of those who changed, 16 became worse than improved. Many patients in inactive disease status changed, including those maintained on antituberculotal therapy. Results support the value of peripheral nerve status monitoring, as well as the instability of neural sensory status.

The objectives of the trial are to establish whether or not combined treatment regimens of limited duration under field conditions can:

a) Prevent relapse during treatment.
b) After termination of treatment be followed by an acceptable relapse rate (less than 1 per annum).c) Ensure that relapses after stopping treatment will be with disease sensitive to therapy.

During the year 1982, 1067 multibacillary patients were put on one WHO recommended regimen.

This cohort of patients have now completed five years of follow-up after successful chemotherapy, for a minimum period of two years or until smear negativity in positive patients.

The acceptability of the regimen was excellent, their tolerance was good and side-effects were minimal. There was a subjective sensation of well being which becomes apparent within 1 year. The rate of clearance of bacilli is however not enhanced and remains at 0.4 to 1 unit per year.

158 patients have been deleted from the trial for various reasons, while 16 patients continue to be under treatment since they are still smear positive.

After more than 2500 person years of follow-up there has been no relapse. The drug regimens recommended are a significant advance in the chemotherapy of leprosy.

This trial is supported by the WHO/World Bank/ Special Programme for Research and Training in Tropical Diseases.

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In the ALERT Leprosy Control Programme out patient treatment of nerve damage of less than six months duration was introduced in April 1987 in part of the control area. The results of the treatment of the first 30 patients, who reside in two districts, will be discussed, as well as the advantages and disadvantages of treatment of nerve damage requiring sectioning/surgery under field conditions. After assessment of technical and operational aspects plans have been defined for extension of the treatment to other areas.

PRELIMINARY RESULTS ABOUT A CONTROLLED DOUBLE-BLIND STUDY WITH THREE DIFFERENT KINDS OF TREATMENT IN SEVERE NERVE DAMAGE.

Martin Dietz and Tebebe Yemane Berhan
A11 Africa Leprosy & Rehabilitation Training Centre (ALERT) Addis Ababa, Ethiopia.

While the treatment of skin reactions is almost always successful with prednisolon the treatment of severe nerve damage is still unsatisfactory. We will report the results of 3 groups of patients, each group containing 5 patients.

Treatment Regimens:
1. AZATHIOPRIN ONLY
2. AZATHIOPRIN + PREDNISOLON
3. PREDNISOLON ONLY

The patients were treated for 6 months as inpatients. The complete trial will be done on 30 patients. Improvement was assessed by voluntary muscle testing, sensory testing (by ball-point pen and Braille test) and by Nerve conduction velocity. Since the improvement of patients treated with Prednisolon and Azathioprin is significant faster and better we will report the preliminary results in the middle of the trial.

A clinical immunologocal and histological study in neurotic leprosy patients.
Central JALMA Institute for Leprosy, Vellore, India.

Neurotic leprosy, a common disease type especially in the Indian subcontinent does not find any place in Ridley-Jopling Classification as also in the W.H.O. recommendations in control of leprosy by chemotherapy. Since all these cases are skin smear negative, arbitrarily these patients are lumped in the paucibacillary group. It thus needs to be seen if neurotic leprosy patients belong to a homogeneous group or the cases could be split across the spectrum on some clinical parameters. For this, an investigation has been undertaken to see if there is any correlation between number and distribution of clinically affected nerves with immunological, and where feasible, histological parameters.

The results indicate that neurotic leprosy patients do not belong to one immunological and/or histological type. Even the number of nerves affected do not give any idea of severity status as, in several cases with just one clinically affected nerve borderline histology with high bacillary content was found.

Detailed results will be presented and discussed.

MULTIBACILLARY LESION IN NERVES OF PATIENTS WITH PRIMARY NEURITIC LEPROSY
Mary Jacob and Rachel Mathai
Dept. of Dermatology, Christian Medical College Hospital, Vellore, India.

Ninety patients clinically suspected of primary neuritic leprosy at the Dermatology clinic of Christian Medical College Hospital, Vellore, India during 1982-1987 were subjected to nerve biopsy. Cutaneous nerve biopsies were taken from representative sites for histopathological examination. In 45 patients, the diagnosis of leprosy was confirmed. Of these, 11 (23%) were histologically classified as multibacillary; 6 (12%) as borderline lepromatous and 5 (11%) as lepromatous leprosy. Thus, multibacillary lesions in patients presenting as primary neuritic form are not so rare as is often considered.

In this paper, the profiles of patients classified as multibacillary by histology are described based on initial and follow-up examinations. 60% of patients had trophic ulcers at the presenting complaint. Globe and stocking anaesthesia and patchy sensory deficits were the commonest neurological deficits. There was no progression of the disease during a 3-4 year follow-up period. The appropriateness of WHO recommended standard regimens of MO and the problems of monitoring the response are discussed.

COMPREHENSIVE MANAGEMENT OF RECENT NERVE DAMAGE IN BORDERLINE LEPROSY ON AN OUTPATIENT BASIS.

Kiran K.Udaya, Sujai Suneetha, Dhoolpet Leprosy Research Centre, Karwan, Hyderabad, India.

A total of 42 patients with recent (less than six months duration) loss of nerve function, who first attended Dhoolpet Leprosy Research Centre during 1982 were included in the study. These 42 cases were divided into three different groups. The first group3 cases of recent nerve damage of early onset, second group6 cases of recent nerve damage of late onset and third group3 cases of recurrent recent nerve damage.

The typical course of treatment consisted, prednisolone 30 mg as single morning dose daily for one month, then reducing the daily dosage step wise by 1 mg. per month. The total course lasting for six months. Complications of treatment were minimal. The management of the three groups of recent nerve damage was similar. The follow-up period was more than 3 years in two-thirds of the cases. Neurological assessment was done at each visit. Majority had good end result and improvement. The end result in the three groups of recent nerve damage were equally good. The results indicate that the corticosteroid regimen used was safe and effective in all the three different groups of recent nerve damage. New methods of health education for care of anaesthetic parts and physiotherapy methods effective on an out-patient basis will be discussed.

The endoneural space as a channel for the spread of M.leprae infection and a possible mechanism of localisation at sites of entrapment.
Pearson, J.M.W.,1 Stanley, J.H.A.,2 Doyle, D.D.,3 Fishet, T.K.,4

1 3 Swan Cottages, Asthal Leigh, Oxon, U.K.
2 University of Keele, Department of Postgraduate Medicine, Staffordshire, U.K.
3 Department of Neuropathology, Institute of Neurological Sciences, Glasgow, Scotland.
4 There have been suggestions that Mycobacterium leprae reach the peripheral nerves via the blood vessels or along the axons. Once inside the nerve it is not clear how the infection spreads from one segment to
another or how localisation of damage occurs at sites of entrapment. Experimental evidence to be presented suggests that the endoneurial fluid space (the extracellular compartiment of the endoneurium) may act as a channel to the spread of infection and inflammatory exudate along the nerve. Obstruction to the flow of endoneurial fluid at these sites of entrapment possibly results in localisation of the nerve damage.

other hand, lysis of Schwann cells could lead to nerve damage and hence contribute to pathogenesis.
FIELD TRIAL OF SHORT COURSE COMBINED CHEMOTHERAPY IN PAUCIBACILLARY LEPROSY.
Kosmini S.Day and M.H.Tuterlusa.
Jakarta, Indonesia.

Preliminary results are presented of the WHO-sponsored field trial in South Sulawesi, which started in August 1985 and which will continue till 1992.

At the time of reporting, January 1989, a total of 565 new, untreated paucibacillary leprosy patients had been selected for the trial. Criteria for selection are presented. Concordance between clinical and histopathological classification was more than 90%.

The treatment regimen of rifampicin 600 mg. once a month and dapsone 100 mg. daily, over a period of 6 months, was well tolerated with minimal side-effects or toxic manifestations. A total of 41 patients (7.2%) discontinued treatment, due to migration from the area, or other reasons, which in no case were due to adverse effects of the chemotherapy.

Out of the total of 443 patients who had completed treatment at the time of reporting, 38 patients (8.6%) still showed clinical activity. Surveillance consists of 3-monthly clinical assessments, as well as urine-testing for detection of surreptitious dapsone-consumption.

Reversal reaction during treatment occurred in 4 patients, and in 5 patients after completion of treatment. At present no relapses have been detected.

Experience so far shows that while the study closely approximates to a service programme, valuable information can be gleaned from a trial conducted under difficult field conditions, with minimal additional inputs.

SURVEILLANCE OF TREATMENT FOLLOW UP (100 MONTHS) IN BOTH REGIMENS.
Kosmini S. Day and M. H. Tuterlusa.
Jakarta, Indonesia.

The results of surveillance following the two treatment regimens are presented. Patients treated in Regimen I had a higher incidence of side effects and were less compliant with the treatment regimen compared to Regimen II.

The findings indicate that short course chemotherapy in paucibacillary leprosy is effective.

Evaluation of Three Short Term Regimens Containing Rifampin for Treatment of Paucibacillary Leprosy.
Kiram Gaiach.
Gopal Rani and Usha Ramagath.
Central JALMA Institute for Leprosy, Tagung, Agra-282001, India.

Three regimens containing rifampin have been tried in 272 paucibacillary leprosy patients selected by the criteria of WHO. In Regimen I, rifampin 600 mg (supervised) is given once a month for 6 months with dapsone 100 mg daily. Regimen II is same as Regimen I but is supplemented with an additional 6 months treatment with dapsone 100 mg daily. Regimen III is same as Regimen II except that rifampin is administered daily for the first 7 days in the first month. Treatment is stopped at 6 months in Regimen I and at 12 months in Regimen II and III. At the end of the scheduled treatment period, 72.2% of patients in Regimen I, 95.5% of patients in Regimen II and 96.8% in Regimen III became inactive. All patients with residual activity of Regimen II and III regressed spontaneously after stopping treatment, whereas, out of 25 active cases of Regimen I worsened after stopping treatment and required retreatment. The relapse rates in subsided cases were 13.9% in
Regimen I; 1.2% in Regimen II and 1% in Regimen III in the two and half years of follow-up after standard therapy, but Regimen II. 210 of these cases in Regimen I had late reaction in the first six months after stopping treatment.

The median delay and the rate of relapses in MB leprosy has been identified as an important indicator that measures efficacy of MDT regimen. Baseline data on relapses occurring in large population of multibacillary patients treated with Dapsone are therefore necessary as references for valid comparison.

Table 1: Details of the study cases

- 134 cases were released from treatment in July-October 1983. Of these 33 cases MDT interrupted their treatment, and 28/33 continued treatment for up to 24 weeks.
- 12 cases were released from treatment in July-October 1983, of whom 21 cases remained under treatment for up to 24 weeks.

Relapse rate was calculated at 12.7 per thousand person-years, ranging from 4.5 for patients with a regularity of 75% in the two periods. Relapses spanned over 20 years after negativity, although 50% of the cases occurred within the first 3 years.

Results of rate and time distribution of relapses are discussed with reference to different levels of regularity.

Table 2: Details of the study cases

- Out of the 243 relapsed bacteriologically occurring in large population of multibacillary patients treated with Dapsone, 210 cases showed negative smear and clinical instability. The results showed delayed stages of improvement. The bacterial index (M) was reduced by 0.8% every month, the severity and frequency of EN and micturitis decreased significantly with the prolongation of treatment.

The present study indicates that the feasibility and effect of combined chemotherapy is satisfactory. Among 192 cases who showed negative smear, 172 cases have been released from treatment for 1 year and no relapse has occurred.

Table 3: Details of the study cases

- Out of these 33 cases, 19 cases interrupted their treatment at 12 weeks, 8 cases at 24 weeks, 5 cases at 36 weeks, and 1 case at 48 weeks. Thus, the median delay of the relapse was 24 weeks, ranging from 12 to 36 weeks. Relapses spanned over 20 years after negativity, although 50% of the cases occurred within the first 3 years.

Results of rate and time distribution of relapses are discussed with reference to different levels of regularity.
bacilli in skin smears. The results of the study will be discussed

José Terencio de las Aguas y
José Ramón Gómez Checavaria
Sanatorio S. Feo. de Gorja
Fontilles (Aliacante) ESPAÑA

Se presenta la experiencia durante 14 años con diversas asociaciones medicamentosas Rifampicina-Isoxprodisan, Clofungina-Sulfonas y Ruphonel-Halofazina-Sulfonas en 120 enfermos multibacilares.

Se expone la preferencia por el uso de las tres drogas, la buena tolerancia y la no presencia de recidivas en los enfermos tratados.

Se comenta la necesidad de unificar las pautas terapéuticas y adoptar los esquemas de tratamiento de la O.N.S. en todos los países.

Ensayo comparado randomizado de tratamiento de los nódulos húmedos por los corticoides tópicos o asociados a una neurolyse.

P. DUCHER, J. MILLAN, M. PARENT,
J.P. PAOLIA-EUSTAL E T. BANC
Institut de Léprologie Aplicada, DAKAR, Senegal

91 nódulos (cubital, medio, isquiotibial) con un sujeto de 6 meses a ciertos nódulos tirados al sort han sido neurolyzados.

El objetivo de este ensayo era comparar el resultado de estos 2 tratamientos (médico y médico-chirurgical) con una duración de 2 años en la misma biopsia quirúrgica que se efectuó al momento del diagnóstico.

Determinaciones fisiológicas con el fin de evaluar el efecto de la neurolyse fueron efectuadas periódicamente. Los resultados fueron tratados por el test de TURK.

Donde no hubo en uno de estos ensayos, existía una amelioración de las funciones sensitivas y motrices dentro de los 2 grupos. Mas no se pudo notar de diferencia significativa alguna que se refiera a la topografía del nódulo, la facultad de las funciones sensitivas, la presencia de cámaras húmedas y la presencia de planes de tracción.

Esta experiencia puede ser de utilidad para el futuro de otros ensayos realizados para mejorar los métodos de neurolyse.
revealed to be satisfactory and effectiveness presented an statistically significant differentiated behaviour indicating a satisfactory performance in services with graduated professionals and insatisfactory performance for trained personal without professional degrees.

Measurement of shock-waves during heel strike
L.K.M. Rahmann, J.L. van Leuwen and A. Huson
Dept. of Anatomy and Embryology, University of Leiden, Leiden, The Netherlands

Human limbs can absorb and attenuate shock-waves to a certain extent. However, orthopaedics (resulting in stiffening of articular chains) may affect dynamic loading of the proximal joints. In a pilot study the transfer of dynamic loads along foot and lower leg during heel strike was studied. Input was measured directly under the heelpad by a light weight accelerometer in hard heeled shoes. Output was measured with accelerometers mounted on an aluminium miniature platform fastened with double-sided adhesive tape and clamped with two straps on the tibia. The transducers measured accelerations in axial and dorsoventral directions.

In the literature no data are found concerning accelerations in a dorsoventral direction. The results show that these cannot be ignored. Further peak-accelerations in axial direction at the tibia are only one tenth of those under the heelpad. At very low walking speeds this difference can increase to a factor of 18. Dorsoventral peak-accelerations seem to be less effectively absorbed over the ankle joint than axial accelerations. However, the dorsoventral acceleration decreases towards the knee. This phenomenon can be explained by comparison of the axes to a pendula.

Surgical management of neuritis of the ulnar nerve at the elbow includes a variety of one or more techniques such as (1) medial epicondylectomy, (2) external decompression by releasing of any constraining structures bands, (3) anterior transposition of the ulnar nerve, (4) inter and intra-fascicular decompression of the nerve. In most circumferential epineurotomy, the epineurium is excised longitudinally over the full length of the visibly involved segment of the nerve, and released from its attachment to the nerve fascicles for alleviation of the circumference, thus effecting a decompression. No operating microscope is used.

53 nerves in 51 patients were treated by this procedure. In those cases (29.8%) where the vascular pedicle could be mobilised without jeopardising the blood supply to the nerve, an anterior transposition of the nerve and its blood vessels was also performed. Nerve function was recorded objectively by voluntary muscle tests and sensory assessment. From among those nerves analysed completely (47), results show that motor and sensibility function improved in 27.8%, remained static in 63.8%, and deteriorated in 8.5%. 6 nerves were either lost to followup or had incomplete data. All patients had relief from pain, and there was clinical absence of tenderness as well. These results suggest that the procedure of circumferential epineurotomy is a useful tool in the surgical management of ulnar neuritis without detriment to the patient.
Decompression consists mainly in external neurolysis except when palpable cecation along the nerve justifies evacuation.

New Boundaries for the Indications for Nerve Decompressions

New Boundaries for the Indications for F.P. 204 Nerve Decompressions


A series of patients with loss of sensation of the extremities ranging from a few weeks to 25 years underwent nerve decompression of the peripheral nerves. Results are discussed and new boundaries for the indication set.

Chemical and mechanical neurolysis.

Haua Yonas Orda and Manuel Hernández Angulo Hospital Antí-Miño de Cuba, La Habana, Cuba

The thickening of peripheral nerves, sequel of a steroid or other substance required under of alteration is not resolved by traditional neurolysis. Surgical liberation is the only alternative. The chemical and mechanical neurolysis we describe offers several advantages of the use of large incision by assuring a greater liberation along the length of the Schwann sheath and the introduction of a steroid or other substance required under the sheath. This technique also offers the possibility of its use in other neurological situations as a therapeutic and diagnostic approach.

Indeterminate Leprosy

Twenty Year Study - Histologic Observations

In 1963 histopathologic studies were made on biopsies taken from 52 indeterminate cases. The changes consisted mainly of round cell infiltration around blood vessels, nerves and dermal appendages; small foci of epithelioid cells were also seen in 16 cases. Nerve involvement were invariably perineurial; 16 cases also showed endoneural involvement, and in 2 cases hyaline change was noted.

Acid-fast bacilli were demonstrated after careful search in nerves in all 52 cases; in 33 cases bacilli were also seen in infiltrate, and in 5 cases bacilli were noted the arrectores pilorum muscles.

Within a period of five years, 9 cases progressed to tuberculoid, one to borderline lepromatous and another one to lepromatous leprosy.

Twenty years later, 21 of the 52 original cases were re-examined. The histologic changes will be presented and their significance discussed.

R.M. Abalos, Leonard Wood Memorial, Philippines

Evolution of Leprosy Lesions in Man

Chacko, C.R.
Schieffelin Leprosy Research and Training Centre, Karijiri, Tamil Nadu - 632 106, India.

On the basis of histopathological studies carried out on early leprosy lesions at the Schieffelin Leprosy Research and Training Centre, Karijiri and

follow-up of patients, an attempt has been made to reconstruct the evolution of leprosy lesions in man.

Studies of nasal mucosal biopsies from Indeterminate, Tuberculoid and Borderline leprosy reported by Chacko et al have shown nasal mucosal involvement in 65 out of 137 (47%) patients, suggesting that the disease is disseminated even when skin lesions appear localized. A further study of nasal biopsies from 36 healthy household contacts have shown presence of nerve infiltration in 40 contacts and acid fast bacilli in 4. On follow-up, none of the contacts developed peripheral nerve involvement and an indeterminate leprosy lesion in the gluteal region.

Nerve biopsy studies from Primary Neuritic leprosy patients have shown a range of host responses from lepromatous to Tuberculoid leprosy reactivity. Six of the patients developed skin lesions on follow-up. These studies have shown that Primary Neuritic leprosy is an early stage in the evolution of the disease.

Based on the above studies a conceptual model of the evolution of leprosy lesions in man has been proposed.

LYMPH NODE STUDIES IN 10 ACCEPSES OF LEPROSOS PATIENTS.

Paul M. Burtin and Dilber G. M. Chacko, Leprosy Lauro de Souza Lima - Rio de Janeiro - Brazil

Lymph nodes of 7 chains (cervical, axillary, inguinal, hepatic, para-aortic, mesenteric and mediastinal) were studied in 10 necropsies of leprosy patients including 1 lepromatous with regressive lesions, 6 with residual lesions, 3 with reactivated lesions, and 5 with lepromatous lesions, as shown.

1. In patients with a clear history to eliminate a previous leprosy infiltrate from the cervical areas, axillary nodes, and in areas para-aortic 5 years after a lymph node is resected, it is not reactive.

2. Two are preserved in paracortical areas in acid-fast, mesenteric, and in most peri-aortic lymph nodes in patients with extensive involvement of paracortical areas of cervical, axillary, inguinal, and hepatic lymph nodes.

3. In 4 patients we found tuberculoid granulomatous reaction in paracortical areas of lymph nodes with extensive lepromatous infiltration.

4. In reactivated lepromatous patients solid bacilli and recent specific infiltrate are limited to lymph nodes which drain cutaneous areas.

Less of those findings suggests that in lepromatous patients the organism can preserve an important contingent of thymus-dependent lymphocytes in circulation although the extent specific involvement of paracortical areas of lymph nodes of cervical, axillary, inguinal and hepatic chains.

THE HIGH PREVALENCE OF TESTICULAR INVOLVEMENT IN LEPROUSOS (LL) AS COMPARED TO BORDERLINE LEPROUSOS (BL) LEPROSOS PATIENTS.

J. F. Gehard and T.H. R. R. Hoa, University of Southern California, Los Angeles, California, U.S.A.

Although testicular changes are known to be common in multibacillary leprosy, details as to prevalence rates are scant, and the Ridley system of classification has not been used in addressing this problem. To study testicular involvement, serum FSH, LH and total testosterones (TT) values were determined by double antibody radioimmunoassay in 42 LL and 31 BL randomly selected male clinic patients. In 25 with low-normal TT values, free serum testosterone was also measured.

Serum FSH values were above normal in 10 patients (30%) in 66% of LL and 35% of BL subjects; mean 60.9 and 10.5, respectively, p<0.0001. Serum LH values were above normal (100 IU/L) in 38% of LL and 10% of BL subjects; mean 22.5 and 11.0, respectively, p<0.0001. Using a TT of 200ng/dl or a free testosterone of 50ng/dl as lower limits of normal, 33% of LL and 5% of BL subjects were hypogonadal, p<0.01. These abnormalities could not be
associated with age, duration of symptoms, age duration of therapy.

Among BL subjects, although only half were Mexican-born, the only anorexigen deficient patient, the only two with elevated LH, and three of the four with elevated FSH were Mexican-born.

In multicellular leprosy the burden of testicular injury was distributed to subjects where the injury is extensive and occurs early. Osteoporosis is a serious health problem which may be common, but preventable, in leprosy patients. The use of Rodin's system appears to be of value in nonimmunological matters. In BL subjects testicular injury appears to be particularly common in Mexicans.

FP 290
TESTICULAR DISFUNCTION IN LEPROSY: RELATIONSHIPS OF FSH, LH, AND TESTOSTERONE TO FLAVINE CLASSIFICATION, ACTIVITY, AND DURATION. William B. Lewis, Andrew P. Lune, Stephen Sarett, Harry C. Reiser, Georgia Schonler-Levis, and C. Wayne Hardin, Dept. of Dermatology, New York Medical College, Hackett Seton Hospital, Dep't of Tohoomology, NYS Institute for Basic Research, Staten Island, N.Y.T., and The Population Council, Rockefeller University, N.Y., U.S.A.

The testes are known to be a favored site for focal damage in patients with leprosy. This is probably because bacillary growth is favored at the lower temperature in the scrotum, since Mycobacterium leprae grows optimally at about 30°C.

There are few studies of testicular disease in unproven leprosy. Therefore, it is pertinent to examine men who are under treatment for leprosy for evidence of testicular failure. In the current study 93 men classified according to the Ridley-Jopling paradigm were examined for the presence of testicular disease. Testes were evaluated for size, consistency, and mass, and for presence of varicoceles. Testicular biopsy was performed on 15 men where clinical and laboratory data suggested the presence of disease.

The findings were correlated with two measures of disease activity, bacillary index (BI) and IgM antibody to phenolic glycolipid I (PGl-I). To determine if these were predictive of testicular failure, LH was elevated in 17 of 19 LL patients and FSH was elevated in 29 of 56 LL patients. LH and FSH were elevated in only 10% of BL, BB, and BT patients combined. Nineteen of the 93 patients examined had low testosterone levels, and 14 of these were LL. LH and FSH levels were significantly higher in LL patients compared to BL, BB, and BT (p<0.001). A positive correlation was seen between LH and FSH (r=0.82, p<0.001) and a negative correlation was seen between testosterone and both LH (r=-0.41, p<0.001) and FSH (r=-0.48, p<0.001). No correlation was seen between hormone levels and measures of disease activity, HI and IgM to PGl-I. A significant correlation was seen between duration of disease and FSH when age was taken into account by partial correlation analysis (p<0.02), indicating that testicular damage is probably cumulative and irreversible. It is recommended that LL patients be routinely screened for hypogonadism using FSH, LH, and testosterone.

FP 215
Charting of organic sites showing the presence of bacilli and specific infiltrate on a series of 120 necropsies from leprosy patients: Tentative of association with cause of death.

Lambardi, C.; Fleury, R.K.; Bachaud, C.M. & Costa Jr., N.L.
Public Health School, University of Sao Paulo, Brazil

The results from necropsies made for a series of 120 leprosy patients deceased in Sao Paulo State within a 10 year period (1970-80) were tabulated in relation to:
1) causes (basic and associated) of death according to 9th I.C.D.
2) Presence of bacilli in different organs
3) Presence of specific infiltrate in different organs (including amiloidosis and reactional infiltrates)

The positive organic sites for items 2 and 3 are charted and the establishment of a relationship with the respective causes of death (item 1) is offered.

FP 219
ENDOTHELIAL CELL BACILLARITY IN HUMAN LEPROSY: IMMUNOHISTOCHEMICAL ASPECTS.

Rotherjne A., Mira R.S. & Mayern W.N.
Institute of Pathology-ICMR, P.H.NO; 12003 and Department of Pathology, Srfdajrangi Hospital, New Delhi-110029, India and Armed Forces Institute of Pathology, Washington D.C.-20306, U.S.A.

The fine structure of the baciliated endothelial cell (BEC) was studied in skin biopsies from 15 LL and BL cases. The results showed presence of BECs in all the biopsies examined. Most of the bacilli in the BECs were uniformly contrasted and seen both singly and in clusters indicating multiplication at these sites. The bacilli were seen on the luminal and subjacent tissue spaces of the BECs indicating transcellular movement into the extravascular spaces. BECs did not show any phagolysosomal formations around organisms. Bacilli were also seen lying free in the lumen and in intravascular monocytes. The baciliated histiocytes in the lesion were centered around the capillaries and showed a centrifugal increase in older cells and degenerated organisms. These observations indicate that BECs are sites for bacillary growth and possibly influence granuloma growth through input of fresh organisms into the granulomas from the BECs and the circulating blood.

FP 219
Leydig cells observed in autopsy cases of the national leprosarium, Oltukomyoen.

Akiko Ohsawa, Mutsuhiro Furuta, Yukate Imai and Nobuo Buroda
National Leprosarium, Oltukomyoen, Okayama, Japan

In Japanese leprosaria today, the average age of patients is higher than 60 years old. Osteoporosis is common problem in older patients. The basis of frequent fractures. Inside carried out a survey of osteoporosis by biochemical index method and observed statistic significance suggesting correlation with pathologic change of testes pointed out as one of the causes of hormonal disorder resulting osteoporosis.

This article focuses on the pathologic change of Leydig cells in the autopsy series of Oltukomyoen.

Materials
The total number is 47 cases and 74 of testes.

1) Type 37561^L
2) Type 70.7^L
3) Type 94 - 76

Average age 70.7

Main findings of testes affected by L leprosy are:
1) Degeneration and fibrosis of seminiferous tubules
2) Degeneration of Sertoli cells
3) Degeneration of interstitial tissue resulting vacuole formation and fibrosis.

Conclusion
Disfunction of Leydig cells based on histopathological changes is possibly related to earlier osteoporosis in male patients with L leprosy.

FP 214
NEW FINDINGS IN THE HISTOPATHOLOGY OF INDOMETACIN-INDUCED LEPROSY.

Bapat, M.V. & Gargji P.A.
Medical College Hospital, Trivandrum.

Skin leprosy was done in 100 patients who satisfy: the clinical criteria for the diagnosis of indeterminate leprosy (IL) according to the Indian Association of Leprologists (IAL). The sections were stained with (1) Haeunotytlin and Eosin and (2) Modified Fite stain for APB and (3) Solochrome Cyamin stain for AFB.

In addition to the histopathological features mentioned by IAL many other fea-
tures pointing to the diagnosis of leprosy were found. The criteria taken for the diagnosis of IL were finding of (1) bacilli at characteristic sites (2) significant nerve involvement and (3) granuloma at sites of election of M. Leprosae.

Out of the 100 cases of IL 60% showed specific histopathological changes and 35% non specific changes. Neural changes were seen in 50% of the total cases and 85% of cases showing specific changes and granuloma in 22% of total cases. Bacilli were found only in one case. Among the inflammatory infiltrates lymphocytes were found in 62.5% of cases and histocytes in 37.5% of cases. Cutaneous appendages were found infiltrated by inflammatory cells in 45% cases.

The significance of these findings is discussed.

FP 216

EFFECT OF MULTI DRUG TREATMENT (PAUCIBACILLARY TUBERCULOSIS) ON THE CLINICAL AND HISTOLOGICAL PARAMETERS OF TUBERCULOID AND RUPTURING TUBERCULOID CASES.
T. SUBI KUMAR, J RAGHUNATHRAO, G. RAJAN BAHU AND ASHOK SINGH.
PHILADELPHIA LEPROSY HOSPITAL, GALOON, ANURSA PRABHAKAR, INDIA.

50 new cases of paucibacillary leprosy (tuberculoid and meddullin tuberculoid) who are put under multi drug treatment during 1987 from three control units of visakhaptnag district, Andhra Pradesh, India, are subjected to detailed clinical and histological examination after the prescribed period of treatment and are under surveillance. Paucibacillary leprosy being according to Government of India was rifampicin 600 mg daily for 3 days and Dapsonc 100 mg daily for 6 months, followed by rifampicin 600 mg daily for two consecutive days once in a month for 6 months and dapsonc 100 mg daily for 6 months. The clinical criteria applied for attainment of inactivity are non-occurrence of new skin lesions, non-extension of existing lesions, neutritis and bacterial negativity. An attempt is made to formulate histological criteria for inactivity in these cases by comparing histological pictures of known active cases under the same types of leprosy.

FP 217

Long-term correlation between serological (PGL-I) and histological parameters in the control of chemotherapy in LL and BL patients.

E. Rudolf Habicht, Wayne M. Meyers, Halard Mohr.

48 patients with histological LL and BL leprosy were treated for 3 years with either DDS monotherapy, DDS plus Rifampicin, or Isopodrnan plus Rifampicin and followed up for 2 years. Clinical and bacteriological assessments were performed at 2 to 3 months intervals. Skin biopsies and serological tests (PGL-I Ab) were done every 6 months. PGL-I Ab correlate well with histology during and after treatment. We conclude that serology, PGL-I Ab ELISA, is as effective as histology in the control of chemotherapy in LL and BL patients.

FP 218

FUNCTIONAL HETEROGENEITY IN RECOGNIZING THE SOCIAL STIGMA ATTACHED TO INDIVIDUALS AFFLICTED WITH HANSON'S DISEASE.

Bob Bellinger

Private Citizen Involved With Leprosy Work

Member of the House of Representaives

Hawaii State Legislature

State of Hawaii

P. O. Box 513
Kaimuki, Hawaii 96730

My involvement with addressing the social stigma associated with Hanson's Disease began first as a concerned citizen and now, as a member of the Hawaii State Legislature. The perspective of governmental responsibility in addressing the social stigma associated with the disease is based upon my experience in dealing with this issue from both those viewpoints.

The key to government involvement is through its ability to provide education and to develop supportive programs designed to address not only the medical needs of the individual but also the psychological and social needs as well. Regarding the educational needs, the first area for government to address is itself, then to the individuals afflicted with the disease and finally to the general citizenry. When talking about government, we often forget that government is people and accurate information is the key to better understanding.

In dealing with the human sensitivities and needs of the individual with Hanson's Disease, Hawaii is among the forefront in establishing positive government responses to the overall needs of the individual. Through our Hawaiian experience, we hope that we can provide a positive innovative model for other governments to consider.

FP 219

MONITORING AND EVALUATION OF TRAINING PROGRAMMES

P. Chacko, S. Arunpathi, B. Devasundaram, P. Solomon and K. Jesudasan.

Schieflin Leprosy Research and Training Centre, Karigiri-632106, Tamil Nadu, India.

The effectiveness of teaching innovations remains underestimated unless evaluative research accompanies the curriculum changes.

The purpose of this paper is to highlight the significance of monitoring and evaluation of training programmes, as a yardstick of performance and quality control to ensure effective learning. The Medical
Officers course being offered at the Schieffelin Leprosy Research and Training Centre, is being analysed as a prototype for this type of monitoring and evaluation of a candidate's performance.

A brief review of this course suggests that the Pre-test is a good indicator of the candidate's performance in the Post-test as well as in the Final Assessment.

This hypothesis is being evaluated further in the two Medical Officer's course in January and July 1988.

Confirmation of this hypothesis will indicate that teaching and training methodology will have to be revised in the light of the Pre-Course test performance.

FP 220
COURSES AT A SPECIALIST LEPROSY HOSPITAL FOR THE TRAINING OF MEDICAL STUDENTS AND PARA-MEDICAL WORKERS IN NIGERIA

Ed. B. Attah and Esther M. Davin,
University of Calabar, Cross River State, Nigeria and
Ola Iloe Leprosy Hospital, Etinan, Akwa Ibom, Nigeria

New patients with advanced lepromatous leprosy frequently report to the Leprosy Hospital for diagnosis and treatment. Patients have spent months or years attending general hospitals without receiving a correct diagnosis of their condition.

To address the urgent need for medical personnel with a basic training in leprosy, as well as a positive attitude to the disease and to clinical contacts with patients, a compulsory module in leprosy was established in 1982 at the University of Calabar Medical School.

All final year students make a number of daily visits to the Leprosy Hospital 100 km away, and theory and practical exams included compulsory questions on leprosy.

In 1987 a student hostel was opened in the hospital grounds and 2-week long residential courses for the under-graduates have now been established.

The paper will outline the nature and development of the link between the medical school and the hospital, the organisation and content of the 2-week residential module for medical undergraduates, the postgraduate programme for medical residents and the 3-month residential in-service programme for rural health personnel.

The marked change in attitude of medical undergraduates will be examined.

FP 221
EXPERIENCES WITH HEALTH EDUCATION STRATEGY BEING FOLLOWED UNDER NATIONAL LEPROSY ERADICATION PROGRAMME IN INDIA

N.S. Sharma and B.N. Mitra
Directorate General of Health Services, New Delhi, India.

The existing set up of Central Leprosy Division, CHEB, State Leprosy Divisions, SC&H & HDI District Societies are being used for development/procurement of health education material. Many voluntary organisations and international agencies are also involved in production of effective health education material. NHRDI, CHEF, TLM, UNICEF, CLBA, DAVIDA are important among them. The objective of health education is to educate people about facts of leprosy and make them aware of availability of free services. Health education material generally used are films, radio, video, exhibition, demonstration, group talks, newspaper and posters, banners, stickers, calendars, flip charts etc. The health education has been evaluated twice in the year 1986 & 1987 during the Independent Evaluation of the Programme. The findings indicate that out of 418 people interviewed in different parts of the country 80.35 knew the nearest place where treatment for leprosy was available. Knowledge of leprosy was relatively low as only over half of respondents knew that it was infectious disease. Out of 289 patients contacted in villages 98.9% were living with their families. Social stigma was much more in urban areas compared to the rural. The lesson learned indicate that health education should be the responsibility of all the health workers. Although general awareness can be developed by any method of Mass Media & Communication but change in attitude and behaviour can be brought mainly through effective personal contact. Thus all category of health workers should be adequately trained in health education and community leadership during their basic training.

FP 222
MOTIVATING AND TRAINING FOR RECONSTRUCTIVE SURGERY AND REHABILITATION IN A SOUTH AMERICAN SETTING.

Frank Dyrrksen, Marcos Virmond and Dilcor Opremolla, Hospital Lauro de Souza Lima, Bauru, S. Paulo, Brazil.

We present our experience and methodology in motivating first and then training surgeons and allied health staff in the area of rehabilitation and reconstructive surgery for leprosy patients. Each year four courses on rehabilitation and surgery are offered at the Lauro de Souza Lima Hospital in Bauru for formal training. The goals of the courses are to show what can be done in the area of rehabilitation, teach the basic surgical procedures of the face, hand, foot and nerve surgery, indications and complications. Methodology is by lectures, patients' presentations and actual surgical procedures. Target audiences are surgeons and therapists but also everybody involved with treating leprosy patients.

The technical training of the surgeons is tailored to each case. We also have a program of visiting Centers treating leprosy patients in order to assess needs, teach, motivate and assist surgeons to start a rehabilitation program. This methodology is different from the long term training usually demanded for surgeons. In the South American medical and health system this is not possible. The training is short term and repeated or in stages. This makes it possible for many to participate, another key factor in this program is follow-up and keeping in touch with former trainees.

FP 223
FACTORS INFLUENCING VOLUNTARY REPORTING OF LEPROSY PATIENTS IN MADRAS, AN URBAN METROPOLITAN CITY IN INDIA

DEREK LINDO, K.S.R.R. RODHUKUMAR, NABI THEGARAJAN, N.MURALIDHARAN.
GRENALTES REFERRAL HOSPITAL & LEPROSY CENTRE, SHENOYNAGAR-MADRAS, INDIA.

Over a 15-year period of Leprosy Control work in Madras, our institution has registered 33,620 cases of leprosy, out of which 25,915 were detected through SLUM survey, 26,808 through School Survey, 8,753 through Contact Survey and the MAXIMUM 38,522 through Voluntary reporting.

An analysis of various factors influencing and motivating Voluntary or self reporting is made through personal interviews with 500 self-reported patients of various age groups and economic status.

The role of Mass Media, group and Individual approach is analysed in detail. In Mass Media, the role of various tools such as Films, Cinema, Slides, Hoardings, Exhibitions, Printed Materials etc. is Analysed. In group approach, the role of groups like Doctors, Local Leaders, Youth Clubs, etc. is Analysed. In individual approach the role of satisfied patients, family members, neighbours etc. is Analysed.

The relative importance of various motivating factors and the ways and means of strengthening them is discussed.

FP 224
The application of a health education model to obtain early and regular treatment of leprosy patients.

Dr. C.H.E. Matthews, Field Director, Christian Fellowship Community Health Centre, Ambilikkal, Tamil Nadu, India.

A model for bringing about behaviour change based on Cartwright's and Lionberger's theories was applied to the problem of getting
leprosy patients to take early and regular treatment. The model includes 3 stages: information, motivation, and action. Information was given using mass methods, including drama, puppet shows, films and slides. Motivation was given through leaders, group methods and individual contacts. At the action stage barriers to taking treatment were reduced as far as possible and individual reminders were given. After application of this method, the percent of known cases taking treatment increased from 43% to 88%, and the new cases found per thousand population increased from 1.0 to 1.8, indicating an earlier case detection. Thus both early and regular treatment were considerably improved by using this method.

The findings show a steady improvement as to actual reactions towards patients, but at the same time the persistence and even intensification of the theoretical negative image of leprosy. The analysis of this paradox reveals inconsistencies in two leprosy treatment projects in different regions of the country. The main finding is that the stigma, due to the social isolation of the patient and the policy making, is widespread throughout the society. Identifying and differentiating the tasks and responsibilities of each peripheral level should differentiate community participation from Community involvement.

Community should acquire the image of morbidity, cooperation and treatment, creating interest and active role in planning, organizing and helping in supervision and health education. Work through change agents (Nonformal leaders).

The research combines historical investigation (archival survey of documents covering the past 100 years) with 21 years' longitudinal research (anthropological observation and interviews with 450 patients and 400 other informants - staff members, patients' relatives etc.), conducted in 20 locations throughout Thailand: leprosy hospitals, rehabilitation villages and outpatient clients. The study examines the changes in social behaviour and attitude towards leprosy following the progresses made in leprosy control policy in Thailand.

The model includes information, motivation, and action. Infor- mation was given through leaders, group methods and individual contacts. The action stage barriers to taking treatment were reduced as far as possible and individual reminders were given. After application of this method, the percent of known cases taking treatment increased from 43% to 88%, and the new cases found per thousand population increased from 1.0 to 1.8, indicating an earlier case detection. Thus both early and regular treatment were considerably improved by using this method.

The findings show a steady improvement as to actual reactions towards patients, but at the same time the persistence and even intensification of the theoretical negative image of leprosy. The analysis of this paradox reveals inconsistencies in terms of definition, incidence, measurement of compliance and factors influencing non-compliance. Furthermore, there is a lack of explanatory models of compliance. The present prospective study takes into account the above methodological, theoretical criticisms and investigations within an inception-cohort framework the factors influencing nonattendance in two leprosy treatment projects based in Bombay (A.L.C.R.T. and T.B.A. Mous, Malaria worker etc).

Identify teams to be trained and trainers for each group. Plan for continuing education.

Review organizational structure. Criteria for referral should be clearly specified. Referral system and channel of communication to be made clear to all categories.

Intersectoral coordination with village health committees and village development committee is important. (Details of each stage given in the paper).

A review of the existing literature on patient treatment compliance in leprosy reveals inconsistencies in terms of definition, incidence, measurement of compliance and factors influencing non-compliance. Furthermore, there is a lack of explanatory models of compliance. The present prospective study takes into account the above methodological, theoretical criticisms and investigations within an inception-cohort framework the factors influencing nonattendance in two leprosy treatment projects based in Bombay (A.L.C.R.T. and T.B.A). Results from the analyses show that nonattendance and irregularity of attendance is widespread (as. 65%). It is also apparent that there is no single or simple explanation for nonattendance. However, with due attention to scientific merit, the weight of evidence leads to the isolation of a small number of factors of undoubted and considerable importance to the reasons why patients do not attend for treatment. These factors are discussed with a view to providing recommendations for the improvement of attendance and priorities for future research in this area will be outlined.
by them. There is also some positive association between perception of the disease, their commitment, and strong knowledge about leprosy control programme and techniques, conviction of the effect of health education in controlling the disease, and their commitment. 

However, significant relation between the workers’ experience have little bearing on their performance and attitudinal changes, were made use of employed to collect data. Secondary data, reflecting the extent of commitment on the part of the workers, were analyzed.

It has been found that the educational standard and the workers’ experience have little bearing on their perception of the disease, knowledge of the national programme, conviction about the effect of health education and their commitment. However, significant relation has been found between their depth of knowledge, perception of the disease, and the techniques of work adopted by them. There is also some positive association between perception of the disease, their commitment, and strong knowledge about leprosy control programme and techniques, conviction of the effect of health education in controlling the disease.

FP 230

RELAPSE IN LL-PATIENTS AFTER ANTI-LEPROSY ICRC VACCINE: ITS SIGNIFICANCE TO ANTIGENIC VARIABILITY OF M. LEPRAE.

C.V. Nagal
Neurophysiology Unit, Grant Medical College, Bombay 400 006, India.

The antileprosy ICRC vaccine was prepared from leprosy derived mycobacteria, possessing lepromin like antigenic property. The ICRC vaccine used in LL-RL patients, since 1975, induced lepromin conversion in 60% of cases and also clinical improvement. This demonstrated the potency and efficacy of the ICRC vaccine to augment CMI against M.leprae, suggesting its prophylactic potential.

During the follow up of over 75 cases, three cases developed new LL-type lesions with 3-6 AFB, 260 years after vaccination, despite lepromin conversion & clinical improvement. It raises the question of origin of new M.leprae and how they escaped induced persistent sensitization. The possibility of emergence of an antigenic variant of M.leprae, that may have existed, was examined by way of fresh culture isolate from new M.leprae. Surprisingly, the new culture did not cross-react with the vaccine strain in the CMI tests in mice and man. This suggested that induced sensitization may be strain specific; and the antigen specificity of the culture may be related to the M.leprae from which it was derived. If the CMI related protective antigen epitopes of M.leprae are indeed variable, it has far reaching and alarming implications in antileprosy vaccine trials, but also provides means of improved vaccine. This will also offer clues to the puzzle of spectrum of disease.

FP 231

NON-IMMUNE CLEARANCE OF M. LEPRAE FROM THE FOOTPADS OF M. LEPRAE-INFECTED, MITHRAMOX-TREATED MICE.

Gillis K.朗的・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・•

PF 232

SYNTHESIS OF VACCINE ANTIGENS FROM M. LEPRAE INFECTED IN MICE

Desikan N.S., and Sreeratha.
Central Jahn Institute for Leperesy, Taj Ganj, Agra, INDIA.

The candidate vaccines used in the trial were autoclaved M. leprae, M. vaccae, M. w., M. vaccae and M. w. alone or combined with live M. leprae. Vaccinated mice were infected with M. leprae to observe the protective value. VNA was assessed by challenging the vaccinated mice with killed M. leprae. It was found that the protective value of M. leprae was not significant. Combination of M. w. with M. leprae netted the protection against M. leprae, while it decreased the protection afforded by M. w. There was a good correlation between the protective value and VNA using autoclaved M. leprae, M. vaccae and M. w. On the other hand, live M. vaccae gave good protection but low VNA.

FP 233

A PROJECT FOR ENHANCING PROTECTIVE IMMUNITY IN CLOSE CONTACTS OF LEPROSY PATIENTS DEVELOPED IN THE ISLAMIC REPUBLIC OF IRAN.

T. Talelli, S. Safarian, R. Chahai-Sadeghi, C.A. Stanford & J.J. Stanford, Iran Leprosy Organization, Tehran, Tehran Sanatorium, Tehran, School of Public Health, Tehran University & School of Pathology, University College and Middlesex School of Medicine, London, U.K.

Healthy children (aged 1-20 years) of leprosy patients living with their parents in Baba-Rahi Leprosy Sanatorium were vaccinated when 12-24 months and then retested with reagents including Leprosin A. Children negative to this reagent, and without a BCG scar were immunized with BCG (110(3) viable M. vaccae. Leprosy patients and their children with a BCG scar were immunized with 110(3) viable M. vaccae. Eight years later the children were retested with Leprosin A and 95% of both groups were found to have become positive in comparison with 80% positivity after BCG alone. A policy based on these results has been implemented at Baba-Rahi and the results of the years' experience will be presented.

FP 234

PROTECTION OF MICE BY VACCINES FROM CELL WALLS OF M. LEPRAE.

Robert Golber, Shirley Hunter, Nahid Hohoghepour, Jedd Minton, Lydia Murray, Patricio Sivu, Habel Tsang, & Patrick Brennan, Gazelle Institute, San Francisco, CA; Stanford University, Palo Alto, CA; & Colorado State U., Fort Collins, CO.

Shepard found that when mice are vaccinated intradermally in the right flank with 110(3) viable M. leprae and then via Smith degrader, and 110(3) viable M. vaccae, 110(3) viable M. vaccae, 110(3) viable M. leprae. These techniques were used to vaccinate mice in the right flank to induce immunity using 0.1 g of 110(3) viable M. leprae, incubated with Freund’s incomplete adjuvant: (a) died with a skin wall that was treated with S05 or via Smith degrader, (b) died with a skin wall that was treated with S05 and then via Smith degrader, (c) died with a skin wall that was treated with S05 and then via Smith degrader.
was afforded generally by 10⁻¹⁰ M. leprae, but not by 10⁻⁹ M. leprae. The crude cell wall material (A) derived from 10⁻¹⁰ M. leprae protected results of 9-month harvests will be presented.

Parallel protection. These studies suggest that cellular immune responses to M. leprae were assessed in leprosy.

Randomly selected mice within each vaccine group, 0 sig-

mass spectrometric analysis of M. leprae the bacteria have to be isolated from infected material tissue, which were then exposed for typically 48h to different concentrations of a drug in an artificial medium, gives information on the efficacy of the drug. For an interpretation of the drug effects, however, the restricted metabolism of the bacteria in the medium has to be considered. The registration of cation ratios from a larger number of individual organisms (app. 500) allows the calculation of their distribution and with that a detailed understanding of the drug response of a bacterial population. It will be shown that the administration of different drugs to M. leprae at comparable concentrations leads to significant differences in the diagnostic value of the Na⁺/K⁺ ratios, indicating different mechanisms of action.

A PILOT STUDY OF THREE POTENTIAL VACCINES FOR LEPROSY IN BOMBAY SCHOOL CHILDREN

J.L. Stanford, R. Ganapati, C.R. Revankar, & E.W. Roots
School of Pathology, University College and Middlesex School of Medicine, London, Bombay Leprosy Project, 6/17 Amir Mavan, Bombay 400 022, India, & National Institute for Medical Research, London, U.K.

Children attending schools in the suburbs of Bombay were skin tested with Tuberculin, Leprosin A, Sorexulin and Vacine. 294 children without F.G. scars and who were M. leprae negative (10%) were vaccinated with BCG.
RESULTS OF ONE YEAR OF PHASE II/PHASE III TRIALS WITH THE CANDIDATE ANTI LEPROSY VACCINE MYcobacterium W.

Sanjiv Talwar, G.P.Talwar, R.Walia, R.Mukherjee National Institute of Immunology, A.K.Sharma, H.K.Kan, Ram Manohar Lohia Hospital, R.S.Maira, Sadarjung Hospital, A.Mukherjee, Institute of Pathology, New Delhi-110 067, India

Myobacterium-w, a cultivable cross-reactive mycobacterium identified from a panel of 15 was proposed as a vaccine against leprosy (Talwar et al Isr.Lep.India vol.30,1978). Phase I trials with this vaccine were reported previously (Int.Lepr.51:159, 1979). Phase II/Phase III immunotherapeutic trials started in December 1986 in two major hospitals in Delhi.

The vaccine trial is a double blind study in which half of the patients receive the vaccine given id, every 3 months multi drug therapy (MDT) and the other half receive placebo (bincrnized starch-MDT. Bacte- rioaccumulation positive, being negative patients belonging to BB, BL and LL spectra are taken for the trial. A matched pair concept, patients assessed by clinical score, Bacteriologic Index, histopathology of lesions and lepromin reactivity. 130 patients are presently enrolled in the trial. Results show a lepromin conversion of 10% in BB, 10% in BL and 53% in LL types of leprosy. Results taken from 6 sites is more rapid in the vaccinated group as compared to the placebo. 13 LL patients with initial mean SI of 5.0 of 2.0 post vaccination, 13 patients receiving the vaccine have shown significant decrease to a mean of 2.3. 3 other LL patients have also been rendered bacteriologically negative in about one year of combined chemio and immunotherapy. Histopathologically, a significant number of patients have shown upgrading in the spectrum after vaccination. Patients receiving the vaccine have also shown marked clinical improvement.
Elevating Individual Feelings of Self-Worth

Support the Handicapped's Rehabilitation Effort (SHARE) is a project begun in India in 1986. Its aim is to increase employment among leprosy patients and other handicapped persons by providing assistance in the design, manufacture, and marketing of handmade items. Export sales to Europe and the United States in 1987 totaled about $20,000.

This paper describes the background and development of SHARE, outlines its economic strategies for rehabilitation projects, and offers case histories of successful design-and-marketing campaigns.

EXPERIENCE WITH A MULTI-ETHNIC SUPPORT GROUP IN THE TREATMENT OF HANSEN'S DISEASE

Janet Gillen and Robert Gebler, Seton Medical Center, Daly City, CA, & Regional Hansen's Disease Program, San Francisco, CA, USA.

The social and psychological ramifications of Hansen's disease have been known to affect patients years after their medical symptoms have resolved. Fear of rejection, lowered self-esteem, and social isolation often pervade patients' lives subsequent to diagnosis. Individual counseling has been effective in reducing symptoms of depression & anxiety. Patients, however, continue to feel isolated & alone in adjusting to the diagnosis. Thus, we began a support group for patients in Northern California in 1987. The group meets on a monthly basis and is composed of both newly diagnosed and long-term patients of multi-ethnic backgrounds. The age range is from 25 to 62. There is a core group of 8 members and new patients join and leave intermittently. The group has proven effective in reducing isolation by the development of a support system among the members. The group has developed its own goal of reaching out to fellow patients by recruiting new members for the group and visiting hospitalized patients for emotional support. The early stages of the support group focused on patient information sharing of physical signs and symptoms, i.e., comparison of lesions, nerve pain, ear pain, and emotional reactions following diagnosis. The group has discussed in great depth cultural misconceptions about Hansen's disease that still govern their belief systems. Intimacy and disclosure of the diagnosis are on-going topics of discussion. The group actively works at elevating individual feelings of self-worth. The major themes of the support group and barriers in starting one will be discussed in detail.

STUDY ON SOCIO-ECONOMIC REHABILITATION

P.K. Gopal

Rehabilitation Officer
Sacred Heart Leprosy Centre, Sankotkot P.O. Rumbokanam R.5.612 401 India.

With the widespread use of Multi-Drug Therapy in the treatment of leprosy, patients are rendered non-infective in a short period of time. Isolating patients in colonies is no longer practised. However, patients with deformities continue to have problems connected with both physical and social rehabilitation. Patients with deformities and facing social ostracism require support for economic independence. As far as possible they should continue to be in the main stream of the community.

Rehabilitation is a means of patient acceptance by society. Socio-economic rehabilitation facilitates the process of social integration.

ONE HUNDRED LEPROSY CURED PERSONS REHABILITATED BETWEEN 1983 AND 1986 WERE STUDIED TO HIGHLIGHT THE SOCIO-ECONOMIC REHABILITATION IN THE COMMUNITY. THEY WERE REHABILITATED IN THE INDUSTRIAL, AGRICULTURAL AND FARM SECTORS. THEIR PROGRESS IN LIVING WITH THE COMMUNITY HAS BEEN MONITORED AND GUIDED PROPERLY.

The study describes the problems encountered by them in socio-economic integration with community and also the results of rehabilitation offered. The economic and social well being of the rehabilitated persons is compared with their condition before rehabilitation. The need for rehabilitation service is emphasized.

CHALLENGING THE STIGMA: FROM LEPROSY TO AIDS

Amelia Skinner, M.P.H.

Sacred Heart Leprosy Centre, Kalaapapa, Hawaii, 96742.

Hawaii's experience with leprosy reveals the tragic long-term effects of a stigma that has been applied to undeserving members of our community. It illustrates the danger and cruelty of misguided public panic and the wisdom of refusing to automatically accept the stigma as part of the disease. It shows us that the best means with which to challenge the stigma are the individuals who are affected by it for their involvement enables us to "put a face on it" and deal with the disease in terms of individuals rather than statistics. Most important, Hawaii's experience teaches us that before making any medical decisions, we must consider the long-term social effects that will persist long after the disease itself is no longer a problem.

The advent of AIDS has witnessed repeated comparisons between the social reactions to leprosy and AIDS. Indeed, it has already been suggested that persons with AIDS be isolated at Kalaapapa. Consequently, how we approach the social aspects of leprosy has implications far beyond this particular disease.

As we challenge the stigma of leprosy, we will also be challenging the stigma associated with AIDS and every other disease that society is afraid of or doesn't understand.

PROBLEMS IN THE ANALYSIS OF SOCIO-ECONOMIC RISK FACTORS IN LEPROSY

Rick Maine, Jory P. Poolinghaus and Paul E.M. Fine. London School of Hygiene and Tropical Medicine, Department of Tropical Hygiene, Keppel Street, London WC1 2HX; and Lepra Evaluation Project, P.O.Box 46, Chilumba, Karonga District, Malawi, Central Africa. 1983 and 1986 were studied to highlight the socio-economic integration with community and also the results of rehabilitation offered. The economic and social well being of the rehabilitated persons is compared with their condition before rehabilitation. The need for rehabilitation service is emphasized.

Leprosy is often thought to be associated with poverty. This relationship is explored herein in an analysis of data from the Lepra Evaluation Project in Northern Malawi, using level of schooling as a surrogate measure of socio-economic status. Though the prevalence of Leprosy was expected to be inversely related to level of schooling, the observed crude rates were 1.96 per 1000, 4.39 per 1000 and 3.74 per 1000 in groups 0, 1-5, and greater than 5 years of schooling, respectively. After standardizing these data by age, sex, urban or rural residence and BCG status, the rates were 3.93, 3.42, and 2.20 per 1000, respectively. The differences between the crude and adjusted rates reflect important differences in distributions, in particular of age, urban or rural residence and BCG status, between groups with different levels of schooling. Though these results are consistent with the hypothesis of school-defined socio-economic status as a risk factor for leprosy, the mechanism remains unclear. The importance of disease for known and potential risk factors in such analyses will be discussed.
COPING STRATEGIES FOR MAKING THE TRANSITION FROM ISOLATION BACK INTO THE COMMUNITY.

William Mah and Elroy Mah
Hansen’s Disease Patients: Members, Board of Directors, The Hawaii Hansen’s Disease Association, P.O. Box 99368, Honolulu, Hawaii, 96825.

The decision to regain one’s place in the community after many years of isolation requires a strong motivating force. This motivation can arise from personal relationships or simply out of a desire to “live again.” Whatever the motivation, the transition is always easier if one has a supportive family. It is also helpful if one has already had the opportunity to interact with people from the outside. Lions Club International was instrumental in exposing Kalaupapa patients to “outsiders” and vice versa through meetings and conventions. As Club members, we were accepted by outsiders while in the isolated setting, which made us less afraid of whether or not we would be accepted outside the settlement.

Upon returning to the community, we each decided to tell people where we came from, even though this meant some people would not associate with us anymore. We felt that if we weren’t accepted by one person, there would always be someone else. Now, years later, our involvement in community organizations such as the Lions Club, theater groups, the Council for the Blind, and The Hawaii Hansen’s Disease Association, provides us with numerous opportunities to educate people about our lives during and after isolation.

FP 269
HANSEN’S DISEASE: THE STIGMA, THE FEAR, THE SOLUTION.
Bernard K. Puniki’s
Hansen’s Disease Patients: Member, Hawaii State Board of Health, Honolulu, Hawaii.

The Hansen’s Disease patient is as important to his successful treatment as the physician. For physicians treating Hansen’s Disease, the primary concern has always been to cure the patient, which is as it should be. However, since it has long been recognized that this disease has a traumatic impact on the individual and his family, the social impact of the disease needs equal if not more attention than the patient’s medical treatment. With regard to social aspects, one physician commented: “It’s all conjecture.” From the patient’s perspective, it is reality.

In Hawaii, we patients have overcome traditional barriers and taken a leadership role in promoting public education. We have worked with social scientists, community leaders and health professionals to create a public awareness of the modern day realities of the disease. In these efforts, the physician’s role as advocate is vital. We have extended our efforts to develop humane alternatives to institutionalization, not only for Hansen’s Disease patients but for others in our community who have special needs. Our participation in this Congress is a major step towards the development of an international partnership aimed at reaffirming the dignity of all persons with Hansen’s Disease.

FP 260
A STUDY ON RISK FACTORS IN SOCIAL DISPLACEMENT OF LEPROSY PATIENTS.
M.I. Thomas and Siva Gankarum
Sedufelgan Leprosy Research and Training Centre, Karadigur-632 106, North Arcot District, Tamil Nadu, India.

The study was aimed at finding the factors responsible for social displacement of patients affected by leprosy.

The samples were selected from patients settled in care homes, whose leprosy patients are settled due to their non-acceptance in the community. Fifty-three patients were selected as the sample who were settled in the above homes for more than three years and have no contact with their respective families. Data was collected using a questionnaire on various socio-economic aspects at three stages, i.e. before diagnosis, before displacement and after displacement.

The following were the findings:
1) 84.90% of the patients have grade—III deformity and are physically incapacitated.
2) 71.6% of the patients felt that their families did not want them because of social stigma.
3) 83% of the patients were aged above sixty and old age is another cause for displacement.
4) 75% of the patients have no source of income.

The study shows that deformity, old age, socio-economic instability and social stigma are the risk factors in social displacement.

FP 252
CARE AFTER CURE IN LEPROSY.
Dr Alexander Thomas, Dr Rebeca Alexander Thomas
Philadelphia Leprosy Hospital, Saler, S. India 532 591

Ever since the introduction of Multi Drug Therapy for leprosy, many patients have been released from the leprosy control, after completion of MDT. However after the medical treatment is over, relapses are to be watched.

The residual problems of anaesthesia and motor paralyses are yet to be followed up with a view to prevent further disability. Provision of foot-wear and ulcer care are integral part of the “Cure after Cure” Prosthetic services and eye care are also very important.

A holistic approach to the problem is suggested with physical, mental and socio-economic care of cured patients.

The existing pattern of rehabilitation carried out ranging from self-appointed colonies special schools to the sheltered workshops and after care institutions in India are reviewed. The needy cured persons are classified as children, women and aged patients.

Need for Vocational Training programmes and job oriented long range rehabilitation plans are envisaged. Cooperation of National, International, Governmental and Voluntary agencies are recommended.

FP 253
STUDIES ON SOCIAL MEDICINE OF LEPROSY IN CHINA
Ye Han, Zhang Shuang, Shi Weixue, Jiang Cheng and Bian Jingmei
Director: MA NAIDEIDILUOHAIMEIDILUOHAI
Institute of Social Medicine, Chinese Academy of Medical Sciences, Beijing, China

Leprosy is a disease in which the socio-environmental factors play an important role in its occurrence, development, rehabilitation, control and eradication. Only by eliminating the unfavorable factors could we achieve the goal of basic eradication of leprosy in China by the end of this century. For this reason since 1949 we have carried out systematic studies on the social aspects of leprosy in a area with a population of about 1,500,000 in Anhui Province, where the prevalence of leprosy has been under control.

1. By means of the study of the epidemiologic features of leprosy and the analysis of their determinants, the epidemic trends of leprosy were forecasted.
2. An investigation of the correlation between socio-economic development and the epidemiology of leprosy were made, which shows that the development of the socio-economic status in the area is the cause of the eradication of leprosy in the area.
3. An analysis of the relationship between socio-economic development and the epidemiology of leprosy were made, which shows that the development of the socio-economic status in the area is the cause of the eradication of leprosy in the area.
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FP 254

THE PROTECTIVE EFFECTS OF METHYL CELLULOSE DROPS AND CONDIL SHIELDS, IN THE PRESENCE OF LAGOPHTHALMOS AND CORNEAL HYPERSTHESIA IN OCULAR LEPROSY

Ph.D. Nurit A. Karacorlu, Tulay Cakiner, Zeki Sürel, Murat Ergünsuz, Cevat Bayilm, Mustafa Dülüz. Carrhapaq School of University of Istanbul and Istanbul Leprosy Hospital, Turkey.

Lagophthalmos and corneal hyposthesia are one of the most frequently encountered lesions in leprosy. They can easily give rise to blindness. Many modalities (such as eye drops, muscle exercises, protective conid shields, surgical treatment etc.) are used to protect the eye from the hazards of the corneal hyposthesia. The first group has 15 patients, under mandatory, supervised methyl cellulose drops and shields. The second group consists of 15 patients, under self-care "when they feel they need it" drops and shield. The third and the last group is formed with patients who are already handicapped by other deformities, patients with evidence of past ulcetia also had lens implanted. 4 patients with positive smear and advanced stages of catarract also had intracarrel lens implantation.

Our results are very encouraging. Above 50% of patients had vision more than 0/12 and only less than 10% with vision loss less than 0/60. Patients with gross corneal opacities which would have made extracapsular lens extraction difficult were excluded from the study.

Except for moderate ulcetia in the early postop period no other special complications were encountered.

Leprosy intracarrel lens group has been compared to normal patients with normal intracarrel lens, and hance patients with intracarrel lens extraction.

Comparison between the bag and sulus fixed lenses have been made.

FP 255

Ocular Complications of Leprosy: Methods for Control.

P. Courtright, Proctor Foundation, San Francisco, USA.

In an international symposium on ocular leprosy was held in London from September 21-23 1987. Working groups prepared recommendations for service and research needs. Suggested tasks for primary health care workers and general paramedical workers include recognition of leprosy as a cause of blindness, knowledge of referral procedures, recognition of patients under therapy and knowledge of eye drop administration. The leprosy (paramedical) doctor should be the frontline in ocular care due to the paucity of ophthalmiclogistic facilities. This worker should be able to assess vision, lagophthalmos (involuntary blinking, gentle closure and forced closure), trichiasis, corneal abnormalities (dull or rough surface, opacity, sensation), and the red eye (iritis versus seasonal conjunctivitis). Training should include patient education, recognition and basic therapy. Medical officers and ophthalmic assistants, given training, should instruct and supervise these workers.

Integration of ocular leprosy into existing programmes in endemic areas needs to be based on data on ocular complications at the local level.

Research priorities include investigation of the following: a longitudinal study of ocular complications in the patient on M.B.T., field trial of suggested proformas for paramedical workers and medical officers, and histopathological and immunopathological examination of ocular tissues.

FP 256

INTRAOCULAR PRESSURE CHANGES WITH POSTURE IN EXPERIMENTALLY TRIGGERED HANSEN'S DISEASE OF MARGARET AND AFRICAN GREEN MONKEYS

Naushad Husain, MD and H. Bruce Outlar MD, F. H. Proctor Foundation, Univ. of California, San Francisco, California, USA

Robert Wolf, MD, University of Texas, San Antonio, Texas, USA

In our long term evaluation of patients with Hansen's Disease, we noted significant reduction of intracarrel pressure in a number of patients early in the course of their disease. Furthermore, significant postural changes occurred in the same patients. In an effort to determine if these changes are meaningful, we evaluated the intracarrel pressures of twenty four experimentally infected and seventeen control monkeys for similar changes in both a sitting and reclining position. We report, herewith, our findings and offer possible pathophysiological explanations as to why the changes occur.

FP 257

THE RESULTS OF A MULTICENTRE SURVEY OF THE OCULAR COMPLICATIONS OF LEPROSY

Timothy ffytche, FRCS, DO

Department of Ophthalmology, St Thomas' Hospital, London SE 1, 1, England.

Since 1983 cross-sectional surveys of the ocular complications of leprosy have been carried out in 24 leprosy centres in 15 different countries throughout the world. This attempt has been made to standardise the methods of the eye examinations and the results show considerable regional and ethnic variation in the prevalence of ocular complications.

There are a number of factors which influence ocular involvement and blindness and these will be discussed together with the findings of the study. From these it is possible to derive some idea of the extent of eye problems in leprosy on a global scale. The limitations of this type of survey will be assessed and compared with previously published studies.
Abstracts of Congress Papers

FP 259

OCULAR LESIONS IN THE ARMADILLO AND MAN - A HISTOPATHOLOGICAL STUDY.

Jacob, M., Schneefeldein Leprosy Research and Training Centre, Karigiri, Tamil Nadu - 632 106, India.

The clinical manifestations of leprosy involving the eye are diverse but primarily in the anterior segment. Representative specimens from the human eye in disease are difficult to obtain hence histopathological documentation are few and the pathogenesis of ocular leprosy relatively unclear.

We present the pattern of involvement of ocular tissues in a retrospective study of twenty eyes and adnexa from armadillos and a pair of human eyes. The armadillo material was from experimentally infected armadillos with disseminated leprosy at the time of sacrifice. The human eyes were removed at autopsy from a patient with advanced lepromatous leprosy.

The armadillo and human eyes showed that in addition to anterior segment pathology, bacilli and inflammatory cells were present in the ciliary body, the choroid, the orbital fat, and the optic nerve. In the human eye the ciliary nerves in the choroid also showed bacilli. These findings give histopathological support that the posterior segment of the eye can be involved in leprosy.

The details of the findings and their significance in the understanding of ocular leprosy will be discussed.

FP 260

EDGE-LIGHT PUPIL CYCLE TIME IN LEPROSY

Murat A. Karacorlu, Zeki Gürel, Ülker Gokmen, Bülent Nangalioğlu, Turhan Seylan, Cem Met

Department of Ophthalmology, Istanbul Leprosy Hospital, Bakirköy, Istanbul, Turkey.

A thin slit lamp beam illuminating the pupil margin produces clearly visible pupil oscillations. These oscillations can be timed with a stopwatch, thus producing a measurement of the "edge-light pupil cycle time". The pupil cycle time is remarkably stable in various testing situations and is repeatable, when the optic nerve is normal, the pupil cycle time is dependent on the innervation and integrity of iris muscles.

The constriction-dilation cycles of pupils exposed to a stationary, discrete slit-lamp beam were significantly prolonged in 97 leprosy patients, as compared to normal controls or subjects receiving dapson, clofazimine and/or rifampicin.

In this study, usefulness of pupil cycle time as a diagnostic criteria for intraocular involvement will be discussed.

FP 261

INTROSCLERAL PRESSURE IN HANSEN'S DISEASE

Naushad Hussein, Paul Courtwright, H. Bruce Otter

Francis I. Proctor Foundation, San Francisco, California, USA.

Because we observed that the intrascleral pressure (ISP) of HD patients was often low on routine screening we retrospectively analyzed 175 cases of HD patients and found low ISP in 35 of the sample. The condition was most frequently associated with avascular keratitis and iritis. In 5% of these cases no other ocular pathology was found.

Subsequently we conducted a pilot case control study of HD cases and family controls, comparing pressures in the upright and supine position. HD patients were more likely to have a low ISP (p<.05) as well as asymmetric ISP between the two eyes (p<.05) than controls. HD patients also had significant postural changes in ISP (.01).

There was no correlation between presence of postural ISP changes and disease duration.

We believe that low ISP and variation in postural ISP in HD patients may be indicative of early insult and deterioration of the autonomic nerve supply to the ciliary body. Prospective analysis of these patients will assist in determining if a low ISP is indicative of early M. leprae infiltration.

FP 262

INVESTIGATION OF 1457 CASES OF LEPROSY UVEITIS IN SOUTHERN PROVINCE

Ma Bingxin et al., China Leprosy Center, Guangzhou, China.

Eye afflictions in 1457 active and cured leprosy patients were found in 17 provinces in Guangdong province in 1985 and 1991. We have completed 72 study projects on 11 aspects of ophthalmological examination that included obtaining histories of leprosy eye disease, ocular examination and correlation of vision, testing carefully at the anterior segments with applanation tonometer and hand held slit lamp, allowing the fundus to be seen and eliciting the pupil, measuring intraocular tension, washing lacrimal passages, and doing conjunctival scraping in active leprosy patients.

Results: 1538 patients (10.9%) were found to have leprosy eye involvements. The leprosy eye lesions were not sex-associated. The incidence of leprosy eye involvement and visual acuity of less than 0.2 and blindness was higher in those with longer duration of leprosy. Eradicated patients have more active disease than active patients. Although the number of patients with leprosy eye lesions was more in multibacillary type, blindness and visual impairment was much more in paucibacillary type. The most common leprosy eye involvement was in the anterior segments and eye usually suffered nasal. 201 patients were blind in one eye (11.891) and 95 patients were blind in both eyes. We also discuss Stellwag's and von Graefe's signs which were noted during the investigation. The causes of blindness and low visual acuity of less than 0.2 were enumerated and analyzed.

Conclusion: Paralytic lagophthalmos and entropion were found in 1/3 of the patients and their sequels caused 1/2 of blindness. In addition to using medicine and functional exercises, we must study and determine the most efficient method for operation of lagophthalmos.

FP 263

THE EYE IN MULTI DRUG THERAPY

Dr. M. A. Huq

A longitudinal study of ocular complications in 1457 cases of all types of leprosy was started in June 1985. Two hundred and thirty seven Multi Bacillary cases on Multi Drug Therapy were analysed and the findings presented in this paper. Twenty seven cases had ocular complications at the beginning of the study while 30 cases developed ocular complications during Multi Drug Therapy. Of these 30, 2 were reactors and the rest were non-reac tors. The longer the duration of the disease the more are the complications. The complications were mostly diagnosed by Slit Lamp examination. Under the Multi Drug Therapy the duration of scle ritis and iridocyclitis has dramatically reduced as compared to nontherapy. Though the eyes are the last to be involved in leprosy they are the first to be involved in relapse. Reactions in the eye take a longer time to subside than in the skin and nerves. Routine eye examination is essential to prevent irreversible changes. Ophthalmic surgery can be performed even on bacteriologically positive patients under the cover of Multi Drug Therapy. Blindness perse does not occur among the adequately treated.

FP 264

Current Clinical Status of Uveitis in Leprosy under various Drug Regimes.


Eye afflictions in 1457 active and cured leprosy patients were found in 17 provinces in Guangdong province in 1985 and 1991. We have completed 72 study projects on 11 aspects of ophthalmological examination that included obtaining histories of leprosy eye disease, ocular examination and correlation of vision, testing carefully at the anterior segments with applanation tonometer and hand held slit lamp, allowing the fundus to be seen and eliciting the pupil, measuring intraocular tension, washing lacrimal passages, and doing conjunctival scraping in active leprosy patients.

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Conclusion: Paralytic lagophthalmos and entropion were found in 1/3 of the patients and their sequels caused 1/2 of blindness. In addition to using medicine and functional exercises, we must study and determine the most efficient method for operation of lagophthalmos.
TARSAI STRIP PROCEDE FOR SURGICAL CORRECTION OF LAGOPHTHALMOS.

N. Survamanithi
Schieffelin Leprosy Research and Training Centre, Karigiri, Tamil Nadu - 632 106, India.

Lateral tarsorrhaphy is a simple procedure to correct lagophthalmos but produces cosmetic defect often disliked by patients and restriction of field of vision laterally. Temporalis muscle transfer operation is a relatively difficult surgical technique and offers best results in bilateral lagophthalmos with intact corneal sensation in young patients. Tarsal strip procedure is a relatively simple technique offering better results in all types of lagophthalmos without any cosmetic defects post-operatively.

The lateral orbital periosteum is exposed after a small horizontal incision on the skin. Tarsal plates on the lateral aspect for a distance of 3 to 4 mm are separated from the anterior lamella. Strips are fashioned out of these plates to be sutured on to the exposed orbital periosteum. The lower lid tarsal strip is sutured slightly at a higher level than the lateral canthus, giving an adequate elevation to the lower lid.

Twenty patients under went the tarsal strip procedure during the last three years. The results are compared with five to twenty years retrospective follow up on forty patients who under went temporalis muscle transfer.

PATTERN OF HAND INJURIES FOLLOWING PROLONGED USE OF AXILLARY CRUTCHES AND THE POSSIBLE SOLUTIONS

Premkunnar R, Durairaj A, Solomon S & Fritschi E.P.
Schieffelin Leprosy Research & Training Centre, Karigiri, India.

Prolonged use of axillary crutches may cause traumatic or iatrogenic lesions of the hand; a condition commonly known as crutch palsy. In most leprosy clinics of the developing world, axillary crutches are prescribed as an aid to mobility and also to reduce weight bearing on problematic feet.

Between 1977 and 1987 at Karigiri we have come across only one patient who developed neuropathy following the use of axillary crutches. Patients have however developed ulceration in their hands, particularly at the thenar and hypothenar eminences. Carpal bone disintegration has also been noticed in some cases. Because of this we have concentrated on investigating the following:

a) accurate localisation of pressure transmission while manipulating crutch handles.
b) identifying how these high pressure areas significantly affect the median nerve at the carpal tunnel level.
c) identifying the risk of possible carpal bone disintegration as a result of prolonged use of axillary crutches.
d) planning rehabilitative therapy techniques to manage these problems without modifying the basic design of axillary crutches.

e) accurate localisation of pressure transmission while manipulating crutch handles.
f) identifying how these high pressure areas significantly affect the median nerve at the carpal tunnel level.
g) identifying the risk of possible carpal bone disintegration as a result of prolonged use of axillary crutches.
h) planning rehabilitative therapy techniques to manage these problems without modifying the basic design of axillary crutches.

To date, a detailed analysis has been carried out on 28 patients. Various modifications to axillary crutches were made. Of these, one modification was found effective in reducing the risk to the hand. The summary of our findings will be presented.
A method for correction of claw hand requiring no re-education.

Roland O., Karen
Masanga Leprosy Hospital, P.M.B. 814 Freetown, Sierra Leone, West Africa.

50 patients have undergone clawhand correction during the period 1983 - June 1987. The method corrects clawing under gripping and the metacarpal arch. The surgical method is displayed. Functional and cosmetic results are primarily good. The method appears to be especially suitable for patients who have a tendency to inactivate tendon transfers from the extensor side (i.e. nursing women in an African village) and under circumstances where specially trained physiotherapists are not available. The only postoperative training required is active flexion and extension of the fingers.

Correction of intrinsic minus in the hand by lasso procedure.

The dynamic correction of intrinsic minus is possible by 2 methods: first, direct substitution by transferring the tendon to Lumbrical's insertion at the dorsal expansion, and secondly, as suggested by Zancolli and based on the Bovier's maneuver, to provide an active stabilizer for the MP-joints. We have recently the second principle in preference. The reason for this is that simple to perform, no interference in the mechanic of the dorsal expansion, not such physiotherapy needed post-operatively, no special splints and instruments are required. The results of 43 cases when the Lasso operations (Zancolli) have been performed are presented.

Surgical correction of claw fingers in leprosy by anterior capsulorrhaphy with pulley advancement: A new procedure.

Dr. K.S.Ran and Dr. M.K.Siddalinga Swamy, Department of Orthopaedic Surgery, Central Leprosy Teaching and Research Institute, Chengalpetu 603 001. INDIA.

Clawing of the fingers is a common deformity seen in leprosy due to involvement of ulnar nerve. Many procedures both dynamic and static have been devised for the correction of deformity.

A new procedure has been devised to correct the clawing of the fingers. Anterior capsulorrhaphy in which distal part of volar plate was excised and pulley advancement was combined with it. 26 hands with two fingers clawing, 2 hands with three fingers and 12 hands with four fingers clawing were corrected by this procedure. Correction of deformity was excellent in 36 of 41 hands. Functionally also there was improvement in pulp to pulp pinch, precision and power grip. The follow up of the cases varied from 2 years to 3 months. The indications and the results are presented in the paper.

Reactivation of flexor carpi ulnaris and opponens of little finger for correction of reversal of metacarpal arch.

August O., Beine
Sivananda Rehabilitation Home, Kuakatali P.O., Hyderabad-500072, A.P., India.

This report presents a new surgical procedure to correct reversal of the metacarpal arch of claw hand in leprosy. The procedure, using the flexor carpi radialis, to restore antagonistic action against extension of the metacarpal V, can be easily performed along with a palmaris transfer for finger correction. It is also more simple than Frenay's procedure and Beine's combined opponens replacement of thumb and little finger, both described in 1973. Its indication as an alternative procedure is discussed. The patient feels that aside from the cosmetic aspect he also gains more control over his hand after flexor carpi ulnaris reactivation and he is better able to safely balance items kept on his palm in cupping position.

Restoration of motor and sensitivity functions of a leprous hand with intrinsic paralysis and partial insensitivity using tendon transfers combined with sensitive nerve transfers.

Türker Özkan, Ayşe Gülgünem, Ayşe Yavuz
Istanbul Leprosy Hospital, Bakirkoy, Istanbul, Turkey

All techniques used for correction of traumatic paralysis give the same result in Leprosy paralysis. But the leprous hand also involves loss of sensation. Therefore, it is of great importance to reconstruct the motor function of the hand together with protective sensitivity.

Many classical surgery techniques used by Seddon, Brand, Mobeg, Littler, Tubiana, Michon, Holevich, Anderson, McGregor, Omer and others since 1950's, have been much improved with the introduction of micro-surgery to peripheral nerve surgery.

In this work, we are introducing 7 patients on whom micro-neural surgical technique was performed so as to provide sensitivity by sensitive nerve transfers from relatively less important parts to insensitive parts of fingers or hand together with intrinsic tendon transfer operations of motor reconstruction. From these 7 patients, 3 had Borderline Leper with only ulnar palsy, the other 4 had sustained traumatic ulnar or median nerve injuries. The first operation was performed on 10th of January 1985. The cases are discussed with regard to technical results.

LONG TERM FOLLOW UP OF PALMARIS LONGUS & F AILED OPERATION FOR CORRECTION OF INTRINSIC PARALYSIS OF THE HAND

S.A. Barde, R.R. Gopan and A.O. Beine
Sivanand's Rehabilitation Home, Kukatpally P.O. Hyderabad, India

Palmaris manystall graft being the procedure mainly used by us for finger correction of intrinsic paralysis we decided to show us more encouraging results than other procedures. Hence we wish to compare our results with those available from pertinent literature.

Well known procedures adopted to follow up the results after intrinsic replacement of active surgical procedures in leprosy were used.

41 cases operated upon in 1984-85 followed up for a minimum of 6 months to a maximum of 2 years showed 24 cases with good results, 9 with a relatively good result 4 with fair result and 4 failures. The failures are mainly due to manual labours. None complained of difficulty in carrying out their work.

We consider this procedure the one of choice in patients who have a PL tendon width less than 2 mm.

THE CLAW REVERSAL OPERATION

S. Arolkar & N.C. Antia
The Foundation for Pedal Research, E4-A, R.G. Thadani Pada Bombay-400018, India

Almost all the operations for the correction of 'claw' fingers in leprosy require difficult operative techniques involving precise in the judgement of tensions and 'air balance'. Almost none can be capable of reconstruction of metacarpal arch so important normal function. An operation is devised to correct both deformities, clawing and loss of metacarpal arch, simultaneously by rerouting the FDS flexor digitum profundus from its insertion into the dorsal expansion case period of follow-up.

The procedure is simple, can be conducted under 'wrist-block' anaesthesia and dispensing with the tourniquet, on an non-patient basis. A simple POP splint is applied to immobilise the corrected hand for 3 weeks. No special physical therapy is required post-operatively, for reeducation.

BLOOD FLOW VELOCITY IN THE CUTANEOUS LESIONS OF LEPROSY: A preliminary report

L.A. Beige, J.S. Thompson, R.C. Potter, T.A. Croo, M.H. Ilies.

Dept. of Dermatology Airlangga University, Surabaya, Indonesia. Dept. of Pathology, University of Dundee, Scotland, U.K.

A laser-Doppler velocimetric technique have been used to measure the skin blood flow changes in the cutaneous lesions of 9 leprosy patients in Surabaya. All were male patients under treatment with the WHO-Multidrug regimen. They consisted of 4 BT and 5 BL patients, confirmed by histopathological study. The BT and one BL were in reversal reaction. The Blood Flow Velocity (BFV) of Tuberculoid lesions not in reaction were slightly raised at the edge of lesions, but normal in the centre. In BT with reversal reaction, the BFV at the edge of lesions were markedly accelerated (up to 30 times). In BL which were not in reaction, the BFV were raised 3-5 times greater over the area of lesions, while at the edge of lesions the BFV level were not much greater than the adjacent normal skin. A similar BFV pattern was recorded from the 5th BL patient which were in reaction. Histometric study of biopsies taken immediately after the BFV measurements showed a clear relation between granulomas fraction and the BFV level. This laser-Doppler velocimetric technique might prove to be useful, clinically accepted, non-invasive technique for monitoring the response of treatment in leprosy. Since it is very sensitive, it may detect very small changes in skin lesions during the course of the disease. It should also prove of value in monitoring the process development of ENL reaction in the early stage.
Ultrastructural observations favor a role for Schwann cell cytoskeleton during bacterial entry and subsequent activation of the host cell as studied in terms of expression of cell adhesion molecules, generation of reactive oxygen intermediates, MHC expression and ability to sensitize lymphoid cells.

Collectively, this information identifies very early events leading to both nerve damage and establishment of infection.

**PO 319**

**CHARACTERISTICS OF ANTINEURAL ANTIBODIES IN LEPROSY PATIENTS**

B. Mukherjee, B. Mitry, A. Yadava, L. Khurat and G. P. Talwar
National Institute of Immunology
New Delhi-110 067, INDIA

In course of studies with a newly developed EIA, it was observed that nearly all leprosy patients carry high levels of IgG class of antibodies reactive with the peripheral nerve antigens. The antibodies were observed to bind to the inner lip of myelin membrane and node of Ranvier in an Indirect Immunofluorescence assay. On SDS-PAGE, the pooled sera from LL, B, BL, BB, BT, TT group predominantly reacted with a band migrating at 55 KD. Epstein-Barr virus transformed cell lines were developed from one TT and two BT patients. In both categories clones were obtained secreting antibodies reactive with the nerve antigen(s) as seen by ELISA and immunobots.

**PO 321**

**BLOOD VESSELS OF THE PERIPHERAL NERVES IN LEPROSY.**

Iraj Rasouli, L. H. Mehta
Anatomy Dept. Grant Medical College
Bombay-400 008, INDIA

Various changes in the endo-
thelial cells, basement membranes with breaking of blood-nerve barrier were reported by several workers (Boddingius, Dastur, Antia, Mehta). However specificity of these changes for leprosy infection was not established. In the present study sciatic nerves of Swiss white mice were subjected to vascular mechanical injuries and M.leprae injection. Morphological changes were seen in all the nerve components. Schwann cells were unable to lose of blood, abnormal myelination was characteristic. The significant changes were the specific reactions of blood vessels to M.leprae infection were seen. In this presentation these observations are discussed.

References:

**PO 316**

**M. LEPRAE ENTRY INTO SCHWANN CELLS AND ITS CONSEQUENCES: AN APPRAISAL USING NERVE TISSUE CULTURE**

N. Mishra, A. Choudhury, S. D’Souza, V. Shetty.
T. C. Tan and H. N. Antia.
The Foundation for Medical Research.
84A, H.G. Vatani Marg, Bombay 400 013 India.

The nerve tissue culture model is a powerful tool to dissect early events in Schwann cell-M.leprae interaction as well as attempt modulation of bacterial entry. Modulation is possible by anti-leprosy drugs and by selective anti-mycobacterial antibodiglied towards surface components. Uptake of M. leprae by Schwann cells is dependent on bacterial viability and antigenic integrity. The former is crucial for early entry but plays a minimal role in late entry which requires direct presence of intact non-proteinic bacterial antigens perhaps mediates hydrophobic interactions with host cell membrane. Besides indicating 2 entry mechanisms, these observations have implications in both chemoprophylaxis of M.leprae infection.
uterastructural level, 4 of the 9 cases examined showed features of interneuronal invasion by sparse numbers of mycobacteria. In two cases, proliferation of bacteria confined to a site within the nerve, could be identified. Other features included minimal myelin breakdown and early collagen proliferation.

It is concluded that significant bacterial infection is probable in cases of long standing contact with Hansen's patients and that ultrastructural examination of nerves may help in some cases of contact with an useful technique, contributory to early diagnosis.

PO 320
HEREDITARY SENSORY NEUROPATHY AMONG 20 CASES IN SOUTH INDIA - A PRELIMINARY REPORT.
S. Somanath, V.R. Parashar, S. Arunathathi and E.P. Prathhas.
Schulkepinn Leprosy Research and Training Centre, Karigiri-632106, Tamil Nadu, India.

20 cases (including 4 pairs of siblings), with hereditary sensory neuropathy of varying types were seen at the Schulkepinn Leprosy Research and Training Centre, Karigiri over a period of 20 years. Some of the common presenting features include (1) possible inheritance, (2) high incidence in peripheral sensory neurons, with a specific sparing of the motor neurons; (3) an involvement somewhat typical of system degeneration - that is, involvement of populations of neurons serving one function. The average age of onset was less than 8 years. The common mode of presentation was with plantar ulcers and/or absorption of digits of the extremities. In lower limbs had to be amputated before the age of 30 because of either chronic intractable ulceration, or neuropathic ankle and foot joints. All patients were screened in detail by clinical examination, skin swab, and in 6 cases by skin and/or cutaneous nerve biopsy, to rule out leprosy, which is endemic in South India. Other possible causes of sensory loss especially in the lower limbs were also excluded. A preliminary report of the clinical and certain other findings is presented. Detailed investigations including electrophysiological tests, biopsy studies, and other methods of studying nerve tissue are under way, and will be presented subsequently. (Those patients are of interest because they are diagnostic challenges, and we believe that there may be more cases with such a diagnosis who may be living for many years in leprosy hospitals and sanatoria because of wrongly diagnosed leprosy in such patients).

PO 321
RELATION BETWEEN NEURITIS OF A PERIPHERAL NERVE TRUNK AND THE PRESENCE OF SKIN PATCH/PATCHES IN ITS AREA OF DISTRIBUTION.
Keseva Reddy P. and Somanath G.V.S.
Nerve and skin lesions are asymmetrical and localized in tuberculoid form of leprosy which is not usually associated with bacteremia. In this form of leprosy the spread of M. leprae is more likely to take place from Schwann cell along the nerve trunk towards the site of predilection in contrast to lepromatous form of leprosy where bacteremia plays an important role in dissemination of bacilli. Peripheral nerve trunk are damaged generally at specific sites. These sites of predilection along the course of a peripheral nerve trunk are well known.

The objective of the paper is to study the relation between the neuritis of a peripheral nerve trunk and the presence of skin patches in its area of distribution. A total of 300 peripheral nerve trunks of 30 patients belonging to TT. BT. and lepromatous leprosy were examined for signs of neuritis. It was observed that the prevalence of neuritis in peripheral nerve trunks with skin patches in their area of distribution was higher than in the ones without skin patches in their area of distribution. This observation suggests that in tuberculoid leprosy, a peripheral nerve trunk with one or more skin patches in its area of distribution is particularly at risk of developing neuritis.
chymotrispin digestion, ammonium sulfate saturated solution soluble with electrophoretically mobility of IgG, Lepra patients' sera and experimentally infected by M.leprae animal's autologous(1gG,1gM) against GLA produced myelinstasis reaction of organotypio culture's nerve cells "in vitro", Trans- fer of mouse 2, C3H/HeJ) spleen lymphocytes sensitized to GLA to intact animals causes peripheral nerve demyelination of the latter. Thus, experimental data demonstrate that nerve damage in leprosy is the result power autoimmune reaction caused by cross reacting antigen of M.leprae and human peripheral nerve's Schwan cells.

Some of them have a common view that the disease is transmitted hereditarily. Social rejection of the patient is a common observation.

The progresses of leprosy control in large part of the world is slow since the social aspects of the problems are not yet equally and effectively tackled along with medical treatment. A well planned extensive organized efforts towards total rehabilitation of physical, economical, social as well as psychological is absolutely necessary. Psychological stress produces the disease in many cases. And this psychological stress should be taken care of.

The importance of the problem was, at last, appraised and included as matter for discussion in the "VIII National Health Conference". Following up the Ministry of Health and States of Health Secretaries have held 22 "Macro-Regional Meetings" when patients and the health workers discussed the problem of discrimination and "Stigma" associated to Hansen's Disease, all matters related with the current Public Health Secretaries. After this meetings and hearing all working levels (Macro and Micro Regions of the Country) the Control Program was reformulated and aimed to make effective the control activities. Many matters of technical and Administrative Norms was discussed: patient care, treatment, social aspects and Health Education.

The the stigma of Hansen's disease is a common observation. This paper describes the useful measures used by patients to society as well as their acceptance of the social environment. Also, this paper is aimed at acquiring a greater understanding of the type and social aspects of the problem are not yet equally and effectively tackled along with medical treatment. A well planned extensive organized efforts towards total rehabilitation of physical, economical, social as well as psychological is absolutely necessary. Psychological stress produces the disease in many cases. And this psychological stress should be taken care of.

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The psychological response of the leprosy patient in the long range depends upon the personal significance at this is mainly due to the influence of the environment, attitude towards the illness, cultural mores and societal norms. The present study was an attempt to analyse the perceptual variation and behaviour noticed among 224 leprosy patients of different age groups in an area of Murali city. Some of the findings of the study were: Leprosy was a more serious illness than the social effects in the patient's death and the death of the patient. Patients were found to show considerable degree of maladjustment in the marital sphere. Socially maladjusted patients were more prone to develop disease. The disease has removed cross cultural barriers. Massive health education given in the district has helped to remove part of the stigma.

The importance of activities for leprosy patients outside of hospital limits.

The problem of accumulation of leprosy patients at the Out-patient Clinic of Dr. Sutomo General Hospital Surabaya. A problem of accumulation of leprosy patients, who for various reasons of motor and visual implications and those with secondary diseases during the course of their treatment, require hospitalisation. Rehabilitation cannot be divorced from medical treatment in these cases and their psychological state must be given first priority. This paper describes the useful measures used by patients to society as well as their acceptance of the social environment. Also, this approach is aimed at acquiring a greater understanding of the problem and the social aspects of the problem are not yet equally and effectively tackled along with medical treatment. A well planned extensive organized efforts towards total rehabilitation of physical, economical, social as well as psychological is absolutely necessary. Psychological stress produces the disease in many cases. And this psychological stress should be taken care of.

The progress of leprosy control in large part of the world is slow since the social aspects of the problem are not yet equally and effectively tackled along with medical treatment. A well planned extensive organized efforts towards total rehabilitation of physical, economical, social as well as psychological is absolutely necessary. Psychological stress produces the disease in many cases. And this psychological stress should be taken care of.
highlighted and a correlation drawn towards the
The changing profile of the colonies is
The following parameters are available—age/
TION
A detailed analysis of the causes of DEHABILITATION
is done.
There are 8 leprosy self-settled colonies in Madras City housing 512 patients.
A detailed analysis of the causes of DEHABILITATION
The following parameters are available—age/
proximately 39 patient visit/day. Although the
was reduced to 1641 at the end of 1987 with ap-
ged by RFC and 2035 by way of drop out or other
caused. 1855 new patients were registered during
The Indian Health Organisation, adopted in April
1985, one of the largest leprosy colonies in Asia & this presentation, presents our first
hand experience in the rehabilitation of inmates
of this very large leprosy colony.
The two main objectives, were to provide adequate & regular treatments with the latest Multi Drug
Therapy Regimen & on stabilisation start a
scheme to make the patients self reliant & self sufficient thro' vocational training.
We faced a variety of situations, generating a
contrast between our plans and the attitude
of donor agencies and the attitude & demands
The ultimate solution of the social problem of
leprosy patients in their rehabilitation process
will come only if there is a remarkable up-
ment of their status in the community
environment. Housing thus played an important
factor in bringing back the self identity and
social identity of the patients.

AN ANALYSIS OF EIGHT LEPROSY SELF-
SETTLED COLONIES IN MADRAS -
A METROPOLITAN CITY OF INDIA.

G.R. SRINIVASAN, DEREK LOGO, JAYARAJ DEVADAS
There are 8 leprosy self-settled colonies in Madras City housing 512 patients.
A detailed analysis of the causes of DEHABILITATION
of these patients, their clinical, bacteriological, vocational and economic status is done.
The following parameters are available—age/
sex distribution, marital status, defor-
mity, bacteriological status, educational
status, economic status, housing conditions etc.
The changing profile of the colonies is
highlighted and a correlation drawn towards the
role of effective leprosy control programmes in the
PREVENTION of DEHABILITATION and formation of colonies.

SITUATIONAL ANALYSIS OF LEPROSY PATIENT-
CASE IN A NON-ENOMIC AREA
R.C. MEERA, V. RAMACHANDRAN, N. K. PRASAD
Dept. Of Dermatology And Leorology
Safdarjung Hospital, New Delhi - 110029,

INDIA

A retrospective analytical study of 820 leprosy patients attending an Urban Leprosy Centre situated in a
metropolitan city in a non-endemic area over a period of three years is presented. Approximately thirty
percent of patients were local inhabitants, 47%
from adjoining non-endemic states and 20% were
distant endemic states. Thirty percent of the
total patients belonged to non-bacilliferous group,
with indeterminate, Multinodular, Nevoid and
Tuberculoid types and the rest were bacilliferous.
Unfortunately 205 patients never attended for follow-
up after registration, 25% were regular and the
remaining 24% were irregular in treatment. An
attempt is made to highlight the difficulties in
leprosy patient-care in cosmopolitan non-endemic
areas in the context of emergence of resistant.--
weanoe, monitoring of patients on RMP and
integration of leprosy control through primary
health care system.

THE ROLE OF RAILWAYS
IN THE CAUSE OF ANTI-LEPROSY ACTIVITIES
Cary M.P. and Shornof H.J.
Jagannath Railway Hospital, Bombay 4, India

Indian Railways (IR) is one of the
biggest employers of the country that has a
population of 800 million (approximately).
Western Railway (WR) is one of the nine Zonal
Railways of IR. At about 800 employees of WR, we
have been able to offer health care to 679 HD
persons including employees (331) and family
members (467) during the period 1982 to Dec,1987.

Current paper delineates on analytical study of these 679 cases emphasizing the emergent benefits
in the management of HD in general and providing privileges to the
afflicted patients in particular.

HOUSING AN IMPORTANT FACTOR IN THE SOCIAL
REHABILITATION OF DISPOSSESSED LEPROSY PATIENTS
T. Jayalal Devadas and G.R. Srinivasan
German Leprosy Relief Association, 4, Gajapathi
Street, Shenoynagar, Madras, India.

One basic aim in the Rehabilitation of Leprosy
patients is to make them self reliant and lead a
life of Social approbation.
This study covered 30 leprosy patients who
were dispossessed socially and economically and were
provided with houses in three different location
in Tamilnadu, India, with a cost of Rs.10,000/-
per unit.
Moreover, 128 contacts of the patients and 75
neighbourhood persons were interviewed in this
connection and following are the findings:
- 93.3% of the total beneficiaries believe
that their social status have gone up and they
are acceptable in the community after
owning a dwelling of their own.
- 89.9% of the total contacts are of the
opinion that the proprietorship of the house
has given a sense of security for the whole
family and their respect towards the patients
have increased.
- 74.6% of the neighbours reported that they
maintain normal relationship with the
patients.

The latitude solution of the social problem of
leprosy patients in their rehabilitation process
will come only if there is a remarkable up-
ment of their status in the community
environment. Housing thus played an important
factor in bringing back the self identity and
social identity of the patients.
instead of spending half of the funds for raw materials, which would help in immediate viability of projects. The attitudes and demands of the patients were also highly specific, so as they would prefer the spending for immediate gains rather than drug treatment & rehabilitation. The presentation thus highlights the features that influence to a large extent any rehabilitation work with leprosy patients in the developing countries.

Leprosy is no longer a major problem in the world for medical researchers, is accountable, especially in a country like India it is one of the major health problems. A commitment of heroic proportions a determined effort to resist prejudiced perceptions, a thrust towards social change, all combined to the mainstreaming of sufferers. It is our belief that to work in this area of leprosy requires a special kind of personality with his/her unique set of perceptions, attitudes & will. To prepare for a detailed study we sought for a viable benchmark. This study is a graphic preliminary which we hope will guide us future.

At the 12th I.L.C. held at New Delhi in 1984 a questionnaire was circulated to the delegates to know their attitude, practice & opinion on some vital aspects of leprosy control/ eradication. Majority had joined leprosy work by choice and almost all felt that leprosy has influenced to a large extent any rehabilitative programs based upon the prejudiced perception and the mainstreaming of sufferers. It is our belief that to work in this area of leprosy requires a special kind of personality with his/her unique set of perceptions, attitudes & will. To prepare for a detailed study we sought for a viable benchmark. This study is a graphic preliminary which we hope will guide us future.

Most felt that eradicating leprosy from the world by 2000 AD is difficult & few opined that it is impossible. There was a consensus that either leprosy is an independent speciality or should be a part of dermatology.

There is a need to understand the social aspects of Hansen's disease. The study of Hansen's disease is important in the approach which favours quantification and individual treatment, in spite the class society structure. This technical and scientific method in the quantification procedure reinforces the ruling ideology, preserving the cultural conception of the stigma of leprosy. The results of the public health system in Brazil are not satisfactory, causing the participation of professionals to take similar. We can justify this study though the existence of a theoretical foundation to support our proposal though methodological procedures based upon the apprehension of social reality, conceived as a whole in its dynamic historicity and complexity, is some kind of participation. The results of the public health system in Brazil are not satisfactory, causing the participation of professionals to take similar. We can justify this study through the following dimensions: The production relations in the underdeveloped areas of the capitalist societies and also cities in class society.

In vitro cultivation of acid fast chemoautotrophic nocardoid bacteria from multibacillary leprosy experimental animals. A.N. Chakraborty and Sujata G. Dastidar. Department of Microbiology, Calcutta Medical College, Calcutta 700 031, India. Nocardoid chemoautotrophic bacteria were cultivated and repeatedly passaged in vitro from all the 22 multibacillary cases of leprosy against some of their non-acid fast counterparts. These grew well on mineral medium when supplemented with the sole sources of C (e.g., liquid paraffin, tetradecane) and N (e.g., (NH₄)₂S, NH₄Cl, urea, arginine) Complex organic substrates, such as glucose, sucrose, glycerol, lactose, citrate, casein, peptone(s), beef/yeast extracts, egg proteins, human leprosy bacillus. The uninfected mouse footpads did not yield NOCARDIOFORM BACTERIA FROM MULTIBACILLARY MATERIAL. Ten lepromatous biotypes, one nerve tissue infected with M. leprae from lepromatous patients, and purified suspension were inoculated into 1/10 and 1/100 media, having Dubos broth and RPMI (former) or MEM (latter) with 40% Fetal and Casein serum. The medium was adjusted to pH 5.1 and cultures incubated at 36°C. The cultures were subcultured inorganic media. The characters of the cultures showed non-acid fast granules, and cocobacillary organisms. Auramine stained smears revealed fluorescent rods and granules. Acid sulphone, potassium citrate, urine and nitrate reduction were negative and catalase was mildly positive. Iso-electric focusing of proteins of LMB done on the various strains showed similar bands. The sonicated suspensions showed lot of acid fast cocobaccillary forms, granules and rods in the deposit, which varied from strain to strain. In late subcultures, the morphology of the non-acid fast forms was similar to acid fast forms.
IN VITRO CULTIVATION OF ACID-PAST CHENOAUTO-
TROPIC NOCARDIOFORM BACTERIA FROM 9 PAUCI-
BACILLARY CASES OF LEPROSY.

Sudral Das, A.N. Chakrabarty & C.P. Bhattacharya

Dept. of Medical Microbiology & Parasitology, Calcutta University College of Medicine, Calcutta 700 020, India.

Acid fast nocardioform chemoautotrophic bacteria could be cultivated to purity from 9 selected, paucibacillary leprosy cases in which APB could be detected. These could grow and be continuously propagated on minimal mineral medium supplemented with only ammonium salts as sole source of N, and paraffins/hexadecane/tetradecane/diphenylamine/aniline/xylene/toluene/benzene as sole source of C; in addition, urea, asparagine or gelatin (as N & C sources) could also be used for their cultivation. No other complex media or substrates succeeded in growing these bacteria. Some of these could utilise xanthin/hypoxanthin/DNA. All these exhibited a dimorphic characteristic: a tissue bacillary phase with only ammonium salts as sole source of N, and acid fastness which could be retained at 64% in the tissue bacillary phase with granules. These were more aerobic than their counterparts from the multibacillary leprosy cases. Some of these could suppress most contaminating bacteria. Their role in leprosy will be reported.

PO 340

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PO 344

Xenodiagnosis of lepromatous leprosy

Annya K. Hati, Sachin K. Chowdhury, Debasish Biswas, Rajjali K. Chatterjee and Dilib K. Panda

Departments of Medical Entomology and Leprosy, Calcutta School of Tropical Medicine, Calcutta 700 020, India.

M. leprae growing in culture readily incorporated two primers of dNTP fatty acid synthesis into its phenolic glycolipid fraction. These results suggest that substrate incorporation into PG-L is might be used to distinguish the metabolically maintained active growing M. leprae in a cell-free system.
leprosy patients. The stomach content of each mouse was immediately smeared on glass slides, dried, demagnified, fixed and then acid fast stain was done. By this method acid fast bacilli were demonstrated in all the patients. Altogether twenty three smears were stained and the bacilli were detected in 80%. The results indicate that xenodiagnosis can be used as one of the methods of diagnosis of lepromatous leprosy patients.

PO345
Molecular Cloning of Mycobacterial DNA
Archanapa Kapoor, Anil Munshi, Pradom Khandkar & G.P. Talwar
National Institute of Immunology, New Delhi, INDIA.

A shot gun approach was adopted for constructing genomic libraries of M. leprae. M. tuberculosis MytKve, BCG and M. vaccae. In a bacterial plasmid pMB12L with L. cell is the host. One of the M. leprae recombinant cDNA, pML36 codes for an antigen Immunoreactive with anti M. leprae sera and not with anti MytKve. This clone has an insert of 5.1 kb and expresses a 35 KD protein. A few clones of BCG origin have been obtained which react more with anti MytKve sera and also with pooled sera collected from active pulmonary tuberculosis patients as compared to sera collected from lepromatous leprosy patients. However some clones are cross reactive with both the sera. The Immunoreactivity of the clones of the clones as determined by ELISA shows several fold more Reactivity with patient sera as compared to normal human sera. Partial restriction map of two of these clones have been done, giving an insert size of 3 kb and 0.9 kb respectively. The size of the protein of one of the cloned gene product ranges between 12 KD - 19 KD. The precise molecular weight is being ascertainment. The results will be discussed.

PO346
PSYCHROPHILIC MYCOBACTERIA IN M. LEPRAE INFECTED TISSUES
Lefald K.S.
Lutheran South Hospital, 4375 Montclair Ave.,
Montreal, Canada H2B 2S5

Attempts to cultivate M. leprae resulted in frequent isolation of leprosy-derived cultivable mycobacteria (LDM). Investigations will be reported to develop a selective culture medium to grow M. leprae, but not the opportunistic LDM.

In a multifactorial medium (MFM), acid-fast psychrophilic mycobacteria were cultivated from M. leprae infected human and armadillo tissues. Media were enriched with growth factors for iron acquisition; mycobactin and exochelin from M. phlei as donor. Enriched with growth factors for iron acquisition; mycobactin and exochelin from M. phlei as donor. Ammonium thioglycolate served as source of energy. Mycobacterium scrofulaceum provided not only by LDM but also by nocardia, yeasts and other common bacteria. The results of these studies will be presented.

PO347
Acid-fast bacilli detected in umbilical cords and skins of human surgical operation
Tatsumori N.
Deputy director, National Leprosarium Yama Zenko En, Tokyo, Japan.

Leprosy may be derived from tolerance disease which is induced by passage the pathogenic organism to embryo. I detected many acid-fast bacilli from skins of surgical operation or umbilical cords of caesarian operation babies by microscopic observation and cultivation. Thirteen cases (27%) out of 49 skins of surgical operation were microscopic positive and 11 cases (22%) out of 49 were culture positive. Eight cases (16%) out of 40 human umbilical cords were microscopic positive and 6 (13%) out of 40 were culture positive.

In one case of umbilical cord, 8 x 10^4 acid-fast bacilli were detected in 10 g umbilical cord. The baby was born carrying 2.8 x 10^6 acid-fast bacilli calculated from the body weights 3.5 kg. This bacilli were cultivated on egg medium as Mycobacterium simiae. None of the cultivable acid-fast bacilli were Mycobacterium microdalis (G), Mycobacterium intracellulare (1) and Mycobacterium simiae (13). No cultivable acid-fast bacilli were 10 cases. These acid-fast bacilli may introduce an immunological tolerance of a cell immunity against leprosy bacillus. Such immunological tolerance person may carry the acid-fast bacilli for his life. It may be a reason that Mycobacterium microdalis can be isolated frequently from nodule of lepromatous leprosy patient.

PO348
Studies on aspartate metabolism in mouse peritoneal macrophages and intracellular M. leprae and M. tuberculosis
V. Sridhara, C. Ratnag and P.R. Hudson
Department of Biochemistry, University of Hull, Hull, United Kingdom.

Aspartate acid uptake and metabolism were studied in cultured macrophages and intracellular Mycobacterium avium. Cultured macrophages in suspension without serum being present in the culture media showed enhanced ability to transport and metabolize exogenously supplied aspartate. Cell free extracts from

PO349
ANTIGENS BY WESTERN BLOT USING PATIENTS' SERA.

The following sera were treated:

- Sera from both treated and untreated patients with leprosy ranging from tuberculoid to lepromatous.
- Sera from patients who received either short or long term treatment for their leprosy.
- Sera from healthy contacts of leprosy patients.
- Sera from contacts of leprosy patients who developed leprosy.
- Sera from treated and untreated tuberculosis patients.
- Sera from BCG vaccinated individuals.
- Sera from Mantoux positive individuals.
- Sera from Mantoux negative individuals.
- Sera from patients with reumatoid arthritis.
- Sera from patients with tuberculosis.
- Sera from patients with ulcerative colitis.
- Sera from patients with Crohn's disease.

We studied the reactivity of these sera with M. leprae and M. tuberculoasis in Western blot. The specificity of the reactivity was further analysed by absorption of the sera with M. avium and other common bacteria. The results of these studies will be presented.
needs to be further investigated.

other parasitic diseases and leprosy must induce us to other tropical countries, the high incidence of malaria, of PGL-I antibodies. It is interesting to note that the areas) than to the illness in itself. In Africa, as in ked to the geographical origin of the subjects (tropical present in leprosy patients, but appears to be more lin- levels of autoantibodies or circulating immune complexes The false reactivity to HIV could be due to the high le- - lymphopenia - impaired delayed hypersensitivity skin tests - circulating immune complexes - lymphocytes polyclonal activation - defects in natural killer activity - impaired interferon activity - alterations in granuloma formation - large amount of non-protective antibodies.

HIV appeared to be an artefact in 4% of the Indonesian - circulating immune complexes - B-lymphocytes polyclonal activation - defects in natural killer activity - impaired interferon activity - alterations in granuloma formation - large amount of non-protective antibodies.

Besides this techniques others such as Nyka modification. Ziehl Nopat et al. used also, in this work we decided to compare these three techniques. Eighteen skin smears were taken from 6 different vi- es from 35 patients, and slides, contain 3 skin smears each, were utilized for each technique. A total of 1,122 skin smears were obtained. The 6 selected sites were: ear, - right, - elbow, nasal mucosa and proximal phalanx of the third and fifth fingers the right hand. Reading of skin smears done by two independent technicians.

Ziehl-Neelsen method the most sensitive when compared With, Ziehl Gabet and Nyka modification.
La libération de radicaux oxydés libres (RLO) par les cellules phagocytaires de lépreux est étudiée in vitro par cholinolinescence, sous l'influence de différents stimuli, soluble (PWM) ou particulier (latex). Dans le groupe des lépreux (LL/BL), la réponse basale (sans stimulus) est significativement plus élevée que chez les tuberculoïdes (TB/BL) et chez les sujets témoins normaux. L'addition de stimulus n'entraîne qu'une faible élévation des RLO chez les lépreux, alors que les tuberculoïdes ont des valeurs proches de la population de référence. Ces résultats suggèrent une saturation de la capacité de réponse des cellules phagocytaires des lépreux sous l'effet de la charge bacillaire au sein de la lignée monocytomacrophagique. Cette étude réalisée chez les lépreux non traités, se poursuit actuellement pour évaluer les variations des RLO sous traitement et au cours des éventuels nouveaux lépreux (ENL).

PO 355
CHARACTERIZATION ON T CELL EPITOPES OR AN IMMUNODOMINANT MYCOBACTERIAL COMMON ANTIGEN THAT MIGHT PLAY A ROLE IN AUTO IMMUNE ARTHRITIS.

Jelle E.R. Thole, 1, 2, 4 U.C.A.v. Schouten, 1, 2 R.W. Deen, 1, 2 W.v. Eden 1, 2 and J.D.A. van der Zee 1
1 Laboratory of Tropical Hygiene, Royal Tropical Institute, Amsterdam, The Netherlands.
2 Bloodbank and Immunohematology, University Hospital, Leiden, The Netherlands.
3 Dept. of Immunology, Veterinary faculty, Utrecht, The Netherlands.

PO 357
DNA PROBES FOR MYCOBACTERIUM DETECTION AND CLASSIFICATION.

Raúl J. Franco, Alejandro Ruiz Treviño, 4 Jorge Zorzopoulos 5
1 Hospital Balmorino Sommr, Bs.As., Argentina.
2 Biólogos S.A., Bs.As., Argentina.

A wide variety of DNA probes has been recently developed for diagnosis of bacterial, fungal and viral diseases. These have proved to be very useful in clinical and epidemiological studies. In order to obtain mycobacterial probes we inserted pieces of M.BCG DNA into the phage 22 plasmid. Colonies were hybridized with 32p. colonies that gave strong signals were selected and the hybrid plasmids were used in dot blot hybridization tests, giving a 90% positive correlation with M. bovis, avium and grastii. No reaction was observed with M. kansasi, flavescens, fortuitum, vaccae, leprae, smegmatis, phlei and marium. This indicates that M.BCG is more related to M. Tuberculois than to M. bovis. Similar results were previously obtained through liquid hybridization assays (Bauer, T. Acta Pathol. Microbiol. Scan. Sect. B. 87,221, 1979). Therefore, M.BCG should be considered a variant of M. Tuberculois and denomination M. bovis BCG is improper. Further studies on the clinical uses of the constructed probes are underway.

PO 358
LATERAL ELEVATION PLASTY IN LATERAL FOOTDROP.

Amadabad Leprosy Hospital, The Leprosy Mission Int., Gujarat, India.

The technique and indication of the LEP are described and discussed. Without loss of function a graft will elevate the dropped lateral margin and by doing so reduce trauma to the lateral footmargin.

PO 359
A Survey of Foot Radiographs of Leprosy Patients in the United States.

William C. Coleman
Gillian V. Long Hansen's Disease Center, Carville, Louisiana 70721 USA

A survey of the foot radiographs of 2000 leprosy patients at the Gillian V. Long Hansen's Disease Center was performed. Records of foot type and pathology identified were established. The findings have been compiled into categories to obtain impressions of possible correlations between foot types and pathology.
Diagnosis and Management of Neuropathic Disintegration of the Foot
Grace Warren and Trevor Smith
McKean Rehabilitation Institute, Chiangmai, Thailand
Institutions of The Leprosy Mission in Asia

Neuropathic disintegration of bone is a relatively common condition in leprosy. It was seen in 117 feet of 400 consecutively admitted patients reviewed in Hong Kong. It occurred in 10% of patients who resumed unrestricted, unprotected walking after immobilization in plaster casts for 6 weeks or more. Early lesions can be suspected by patients taught to look for painless heat and swelling.

History - Non-specific, usually no trauma.
Signs - Painless heat and swelling.

Later - Increasing deformity and hypermobility, predisposing factors - Osteoporosis, immobilization, sepsis.

Management - Complete immobilization for prolonged period, till no heat and swelling on resumption of supervised, graded walking. If the foot is hypermobile it should be moulded into the optimum possible functional position, during plaster application.

Follow-up - Patients can wear resilient sole footwear such as canvas shoes. They should not require special supportive or moulded footwear. Fully healed bone stands incompatible with ulcer free walking, can frequently be finished using the transfer automatically in walking.

Achilles tendon usually needs lengthening.

As people with insensitive feet walk on plantar foot ulcers, deeper structures of the foot become damaged by repetitive stress and inflammation. When a synovial membrane is damaged in this process, synovial fluid drains through the wound. The synovial fluid will interfere with complete healing of the wound. A treatment protocol, which has proven to be successful in the United States, is presented.

Three cases of amputation of feet and one case of conservative treatment are described. The advantages as well as disadvantages are discussed.

The pes varus is one of the deformities encountered in leprosy patients who have not received rehabilitation treatment at the correct time. Generally, this occurs when the disease is hidden and the patient only applies for help when the deformity is very incapacitating for walking. The surgical treatment usually employed when the foot allows passive mobility consists of the tendon transfer in substitution of muscle paralysis. Triple arthrodesis is usually performed when the deformity is irreversible. It must be noted that varus deformity causes support on the outer edge of the foot and the following formation of ulcerative lesions with lesser or greater depth until osteomyelitis lesions occur. The peri-astragaline bone structures do not keep a normal anatomical relation and its consistancy is altered. The triple arthrodesis, a relatively simple technique to carry out, becomes difficult and, also, its proximity to ulcerative lesions is, therefore, an infectious risk factor. Carrying out a bone excision in the external base, in the supramalleolar region can correct the deformity by changing the point of support and avoiding pressure on the outer border. This permits us to keep a distance from the septic focus.
results in healing. Such reduction of plantar pressure can be achieved by bedrest or by the use of crutches. These methods of treatment are often not acceptable to the patient. A total contact cast extending from below knee to the toes has also been found to cause healing of plantar ulcers especially those situated in the forefoot. Since each a cast does not permit inspection of the ulcers of the forefoot while it is in position a trial of a cast extending from the tibial tubercle level to the midfoot has been carried out.

The results are analyzed and advantages and disadvantages are discussed.

THE HEALING OF PLANTAR ULCERS.

Parthi Kaplan and Robert W. Celber
Regional Hansen's Disease Program, Family Health Foundation of Alviso, San Francisco, CA., U.S.A.

As many of today's leprosy patients are not being hospitalized or institutionalized, an alternative to the traditional plantar cast of Paris (POP), below knee total contact cast (TCC) has become necessary to convince patients to accept casting and to enable them to return to work or school while the ulcer heals. At our clinic we applied casts to 24 patients having plantar ulcers using POP and/or fiberglass fabric impregnated with polyurethane resin. We evaluated each for time needed to effect healing, health of the skin inside the cast, ease of application/removal, and patient satisfaction. We compared the time to effect healing using a TCC to the time healing occurred when the patient refused casting (30 patients). These patients were debrided, given specially molded shoes and advised to decrease ambulation. The average time required to heal a plantar ulcer in these patients who were casted was 3.6 ± 2.6 weeks, while those refusing casts, if they healed, took an average of 5.1 ± 4.6 weeks (P = 0.1). All casted patients' ulcers healed. Only 23 of the 30 non-casted patients ulcer healed. The traditional POP TCC is very effective in healing ulcers quickly and without complications when applied correctly. A minor modification, the addition of a fiberglass reinforcing strip, makes the cast lighter and stronger. However, the cast is still heavy and requires 24 hours to dry before ambulation is permitted. This type of cast is also somewhat difficult to remove because it is not bivalved. Other modifications of this POP cast have similar drawbacks. A TCC of fiberglass was applied successfully to 7 patients. If applied skillfully, this is an excellent alternative as ambulation is possible immediately, it is lightweight, and removal is facilitated by bivalving. Caring to heal plantar ulcers decreases the time the ulcer is open and subject to infection. The lighter the cast, the more acceptable it is to the non-hospitalized patient.

TREATMENT OF TROPHIC ULCERS IN LEPROSY - A PILOT STUDY COMPARING DILANTIN POWDER AND ZINC TAPE.

Jacob Matthew, Derek Lobo, C.J. Joy, V. Thyuvendran, P. Gracy.

Cremaltes Referral Hospital & Leprosy Centre, Shenyo Nagar, Madras, India.

Phenytoin and Zinc have been increasingly used in the healing of skin and soft tissue wounds and ulcers. A prospective study at our institution, comparing the efficacy of Dilantin powder and Zinc tape against standard dressings for trophic ulcers in leprosy, was done on a pilot basis. A total of 57 leprosy patients with trophic ulcers were selected for this study. They were randomly allotted into one of the 3 groups:

Group I - Phenytoin powder alone.
Group II - Zinc Tapes containing 25% Zinc oxide alone.
Group III - Saline dressings.

Group I - Phenytoin powder alone.
Group II - Zinc Tapes containing 25% Zinc oxide alone.
Group III - Saline dressings.

The results are analyzed and advantages and disadvantages are discussed.

The aetiology of plantar ulceration in leprosy is well known. Increased pressure maintained over a long time will result in tissue breakdown. Since the cause of the plantar ulcer is mechanical, relief of the increased pressure...
Most of the patients under the study received routine anti-leprosy drugs and a few received short courses of antibiotics for underlying secondary infection. The advantages and disadvantages of Zinc and Phenytoin powder in comparison with standard saline dressings are described in detail with planimetry and clinical Photographs at pretrial, mid-trial and post-trial stages.

**PO 372**

**WOUND HEALING IN TROPIC ULcers OF Leprosy in India**

Malhotra,Y.K, and S.S.Amin
Post Graduate Dept. of Dermatology, STD and Leprosy, Now Teaching Hospital, S.N.Medical College, Jodhpur, India.

Fifty leprosy patients with chronic non-healing trophic ulcers of duration from 1 to 9 months were treated with topical diphenylhydantoin. Results were compared with another similar group with topical zinc dressings. Healing was recorded in terms of initiation of granulation tissue response, discharge, opportunistic bacterial infection and mean healing time. 69.7% of DHN patients showed complete epithelization as compared to 5.8% in zinc group In a hospitalised study of three months.

**PO 373**

**Heel ulcers in leprosy treated with island flaps from the instep of the sole**

Paul E. Craven and Victor B. Smith
 ALERT, Addis Ababa
Ethiopia

In leprosy, ulcers involving the heel are less common than in the forehead. When they occur it seems that they usually are due to external injures. Small or superficial ulcers with intact pulp can usually be treated with simple rest or split skin grafts. The large heel defects however, with loss of soft tissue and sometimes osteonecrosis of the calcaneus can be extremely difficult to cure. The conventional transpositionflaps can often not be made big enough for a successful long term coverage of the weight bearing area of the heel. For a couple of years we have used fasciocutaneous island flaps from the instep of the foot elevated, on the medial plantar vessels for large heel defects. Operative technique will be described, and the results of about twenty operations carried out on anesthetic leprosy feet presented.

**PO 374**

**Management of Stasis Leg Ulcers in Hansen’s Disease**

Frank Duerson, Alvin Stahl and Marcos Virmond.
Mennonite Leprosy Hospital, Kilometer 81, Paraguay.

Ulcers in the distal third of the lower leg are not uncommon in patients with Hansen’s disease. They are very similar to venous stasis ulcers but have some unique features. The pathophysiology is poorly understood and there is only very little to find in the literature. We would like to present our experience in managing this difficult problem and try to raise some hypothesis as to the pathophysiology of these ulcers. It is important to treat these lesions aggressively because they are one of the principle causes for amyloidosis when they become chronic. We also present several patients where these chronic ulcers have transformed into carcinomas. Detailed surgical management is presented. The surgical treatment can be successful in closing these longstanding ulcers. Although recurrences are common (since the basic pathology has not changed it is much easier and faster to treat the usually smaller occurrences). Probably the greatest advantage in skin grafting in closing the etiias ulcers is social. It eliminates the constant dressings needed and also the bad odor that usually accompanies these ulcers.

**PO 375**

**TRATAMIENTO CON APOSITOS DE HIDROGELOLIVOS SECISISTÉTICOS EN ULCERAS HANSENÍENAS**

José Ramón Gómez Echevarría
José Terencio de las Aguas
Sanatorio S. Feo de Borja
Fontelles (alicante) ESPAÑA

El número de uniformes tratados ha sido de 14,con un total de 19 úlceras tópicas. La edad media de 63 años. Sección de los resultados es buena o excelente en todos los casos, con una media de 17 días el porcentaje de curación. La tolerancia ha sido buena.

**PO 376**

**USE OF EPIDERMAL SKIN GRAFT IN MANAGEMENT OF UNCOMPLICATED FOOT ULCERS IN Leprosy Patients.**

S.Ananth Reddy, Kiran K. Udaya, Beine A.
Sanjit A.Cordeiro and Sr.Maria Kuttikal.
Sivananda Rehabilitation Home,Kukatpally,Hyderabad.
500072, (A.P) INDIA.

Every effort should be made to prevent trophic ulcers in patients with loss of sensation in the feet. However, in the event of patient having trophic ulcer, it should be seen that the ulcer heals within the shortest time possible. Epidermal skin graft was used in patients with trophic ulcer in foot who were under treatment at Sivananda Rehabilitation Centre, Hyderabad. The procedure is simple, ordinary scalpel is used to take the epidermis from adjoining area and then covering it on the uncomplicated ulcer, followed by vaseline gauze dressing. 63 cases with uncomplicated ulcers were included in the study. Majority of ulcers healed with 1st graft itself. Most of the cases healed with second or third graft. 15 percent cases did not heal even after repeated graft procedures. (The response was comparatively less in active lepromatous Leprosy patients). However, with each rejection of graft, better granulation was observed. Among the healed ulcers three fourth of cases healed within 20 days and the remaining within 20 days.
The results of the study indicate that epidermal skin graft procedure for management of uncomplicated ulcers to be acceptable, effective and significantly cuts down the hospitalization/healing time in majority of cases.

PO 377

Collagen Sheet and its usefulness in healing of ulcers in Leprosy Patients.

Dr. M. E. Siddiqui, Mr. Mahendra Kumar, Dr. K.S.Rao, Dept. of Orthopaedics, Central Leprosy Teaching and Research Institute, Chengalpattu 603 001, INDIA.

Collagen is a natural tissue present in the body. For healing of any part, Collagen has been node available in the form of sheets which is obtained from natural nonhuman tissue of healthy animals. It is purified, crosslinked and sterilised. Collagen Sheet as a dressing prevents air borne infection, minimizes the discharge from the wound and helps in appearance of granulation tissue and epithelialisation.

Plantar and Non-Plantar Ulcers are common in leprosy and pose a problem in healing. Therefore, Collagen Sheet application was done on 75 patients having plantar ulcers and other types of ulcers like Stasis Ulcers and Post-operative wounds. The results were excellent in 44(58.6%), good in 20(26.6%), fair in 5(6.6%), and poor in 6(8%). The healing time of the ulcer was shortened and healing takes place with minimal or no scar tissue. The indications, healing time, type of ulcers, cost effectiveness are discussed in this paper.

PO 378

THE EXTENT OF LEPROSY-RELATED DISABILITIES IN TURKEY

Tutku Cakiner, Ayse Yuksel, Ayla Kultur, Turkam Saylan

Istanbul Leprosy Hospital, Bakirkoy, TURKEY

Turkey has a national population of approximately 50 million and there are 3997 registered cases of leprosy.

In this study, realized between January 1986 and February 1988, 454 leprosy patients were evaluated according to their age, sex, province they live, classification of their disease and disability using WHO grading.

74% were lepromatous cases and 76% were between 30 and 59 years of age, sex, province they live, classification of their disease and disability are discussed in this paper.

PO 379

A STUDY OF THE HAND AND FOOT CONDITION OF PATIENTS ADMITTED TO ISTANBUL LEPROSY HOSPITAL DURING 1987

Ayse Yuksel, Kathy Johnson, Ayla Kultur

Istanbul Leprosy Hospital, Bakirkoy, Istanbul, Turkey.

In Turkey, many of the leprosy patients have secondary disabilities. Problems related to these disabilities is a frequent reason for hospital admission. In this study, reason for admission and treatment given was recorded and tabulated.
Previous studies from our laboratory have demonstrated that although macrophages (MC) isolated from the lepromatous foot pad (LFP) and from the draining lymph node (LN) of M. leprae-infected mice share most phenotypic and functional characteristics with peritoneal MC, because of their heavy intracellular burden of M. leprae, these foot pad and LN MC are refractory to activation by recombinant mouse interferon gamma (rIFN-γ). Regardless of rIFN-γ dose, M. leprae burdens of foot pad and LN MC could not be activated to an enhanced macrophagic capacity (lepromas, LAM), although there was a marked increase in the proportion of LAM cells over LFP cells. The proportion of LAM cells, however, showed only a marginal increase over that seen in the early response, while there was a continued increase in the proportion of LFP cells giving an LFP/LAM ratio of 7:4.

The injection of cobalt-irradiated M. leprae into the sac of the guinea pig induces the formation in the draining lymph node of granulomas containing phagocytic macrophages. These cells are MHC Class II antigen positive and carry an antigen found on activated macrophages. Cells from the granulomas lymph node proliferate in vitro in response to PPD. Macrophages separated from the granulomas using a monoclonal antibody to the macrophage antigen do not present PPD to sensitized T cells. The antigen-presenting cells are present in the MHC Class II antigen positive population of the granulomas lymph node cells and are enriched in the low density fraction on Percoll gradients. This fraction contains about 50% macrophages, 30% T cells and 10% B cells. T cell and macrophage depletion had no effect on antigen presentation by this fraction. A non-antibody to dendritic cells has been purified and demonstrates that the low density fraction of Percoll gradients with this antibody completely abrogates antigen presentation. It shows that the main antigen presenting cell in the lymph node containing M. leprae induced granulomas is a low density dendritic cell which in strongly MHC Class II antigen positive.
A LIGHT AND ELECTRON MICROSCOPIC STUDY

Liu Lijun, Ji Dongping, W Slimmers and Young Chicheng, Department of Pathology, Shanghai Medical College, Shanghai, China

The lesions of peripheral nerves in infected armadillos with Mycobacterium leprae have been studied by light and electron microscopy. We found some lesions in areas of nerve fibres which have not been reported in previous literature. The development and progression of nerve lesions in the armadillo, as well as the presence of notons fibres inside the axons, will be helpful in the study of the pathogenesis and development of leprosy in armadillos. Evidence for the spread of leprosy lesions to the peripheral nerves is shown to be not only by the homologous route, but also by the way of the lymphatic.
PROFILE OF MULTIDRUG THERAPY IN MULTIBACILLARY LEPROSY CASES IN AN URBAN CONTROL PROJECT IN INDIA.

N. Mathew, V. Devanuri, J. Mathew, T. S. Petros, U. Lobo. Grenulates Referral Hospital and Leprosy Centre, Shennoy Nagar, Madras, India.

A prospective study has been undertaken to evaluate the effectiveness of four different regimens for MB leprosy cases in an urban leprosy control set up.

Of the 531 MB cases in the project area, 381 were included in the study which began in 1981 and is still in progress. The cases were randomly allocated to one of the following regimens:

I - 21 days of intensive daily Rifaopicin, Dapsone, Clofazimine, Dapsone followed by daily CLOF, DDS + monthly BMP.

II - Daily CLOF, DDS + monthly BMP.

III - Daily Isopropion + monthly BMP.

IV - Various older MDT regimens using RMP, CLOF, DDS.

All BMP doses were supervised. The 381 cases were investigated as follows:

1. Clinical profile, blood profile including RFT.
2. Skin smears at initiation, every 6 months and at the time of Release From Therapy.
3. X-Ray Chest, VMT and stools for parasites at initiation and at RFT.
4. Paper analyses in detail the changes in the clinical, bacteriological and blood profiles, complications during treatment, relapses during surveillance, besides discussing the merits and demerits of the four regimens used.

THE APPlicABILITY OF ETHIONAMIDE IN VARIOUS CLINICAL FORMS OF LEPROSY, IN COMBINED CHEMOTHERAPY.

Elizabeth Pedreira, Iselda Costa, Luiz Licio Daniel and Rosa Maria Carneiro.

Dermatology Service, University Hospital, Brasilia - BRAZIL.

MDT was introduced in Brasilia, in July 1983, to study operational aspects and its implementation.

113 patients were treated with the MDT regimen from July 1983 to September 1986. In 34 of these patients we substituted Clofazimine or Dapsone for Ethionamide, in the dose of 3 to 10mg per kg bodyweight per day.

We checked our patients for blood counts, urinalysis, and biochemical study, monthly for the first 6 months and then every two months.

We have 5 patients excluded. Two of them abandoned treatment for unknown reasons and 3 presented nausea and vomiting.

We have not found any alteration in 29 remaining patients treated.

IMPLEMENTATION OF MULTIPLE DRUG THERAPY (MDT) IN THE NATIONAL PROGRAMME OF TANZANIA.


In 1977 the National Tuberculosis and Leprosy Programme of Tanzania was launched, aiming at controlling the two diseases as an integrated programme, nation wide, using the same manpower and Health services, within the National Health structure. The programme is managed at 3 levels: (a) MO; (b) 3000 district PHOs and (c) 102 medical assistants. The case detection dropped from more than 50000 in 1979 to around 14000 in 1987. In 1983 the Ministry started MDT, using the drug combination of Isopropion and Rifampicin.

Different MDT regimens were adopted, depending on classification and Skin Test results. Rifampicin should be given under strict supervision. PB patients are treated for 6 months, whilst MB patients are treated for 24 months. In principle a step by step method was followed to implement MDT district after district.

Registered patients were reassessed and medical personnel invited for seminars. Cohort analyses show treatment results for 60% PB and 140% MB patients. Results are improving over the years. The average success rate for PB and MB patients is 8% and 2% respectively. The proportion absconders for PB patients (6%) is half that for MB patients (2%). The reduction of the patient load provides the medical worker with more time to improve the service. It can be assumed that MDT attracts patients.

Better treatment is the best propaganda in the villages, for bringing new patients to regular and early treatment.
La tasa de morbilidad se ha modificado poco, con Isoprodian-RMP el tratamiento dura 3 a 5 meses. Tasa de abandono de tratamiento: 3.4%. Alias par curacigón (más de 3 años de control post-tratamiento): 4.607, abandonaron 265 (17.5%). En los 9 años se detectaron 8.707 casos de los cuales descenso: 13 x 100.000 en 1979 g 5 x 100.000 en 1987. El programa de lucha anti-tuberculosa comenzó en 1979, paulatinamente la monoterapia sulfoníca, pero decidió en diciembre de 1987 la inclusión de rifampicina, a thioamide y dapsone o clofazimine. Las reacciones adversas han sido notadas en un par de pacientes. Tolerado en muchas regiones, algunos efectos secundarios serios han sido observados. Los estudios de bacteriología y histología han demostrado, tanto en el Proyecto Malta como en el de Paraguay, importantes conclusiones. El tratamiento de la lepra incluye la combinación de RMP y Dapsone. El tratamiento de la tuberculosis incluye rifampicina, isoniazida y etambutol. Es importante diferenciar estas reacciones entre las respuestas a la reacción de las bacterias y la respuesta a la terapia de antibióticos.

**PO 398**

**ESTADO ACTUAL DEL PROGRAMA DE LEpra Y TUBERCULOSIS EN PARAGUAY**

Dr. A. Alvarez y Dr. O. Leguizamón.

Departamento de lepra-ministerio de salud pública y bienestar social-Asunción-paraguay.

El programa de lucha contra la lepra con ISOPRODIN-RMP se está desarrollando desde octubre de 1979. La eficacia y tolerancia del Isoprodian-RMP ya han sido largamente demostradas, tanto en el Proyecto Malta como en el de Paraguay, informados al Congreso de DoHl (1984) y al IX Congreso Mundial de Enfermedades Infecciosas y parasitarias (Munich, 1986). Actualmente se desarrolla en 31 centros de atención en Paraguay reemplazándose paulatinamente la monoterapia sulfoníca. Hasta diciembre de 1987 la situación era:

- **Tasa de curación**: (más de 3 años de control post-tratamiento): 571 casos; bajo tratamiento: 1.144; en control pre-tratamiento: 1.090; además con sulfononatropina. 1.729
- **Tasa de abandono de tratamiento**: 3.4%
- **Tasa de mortalidad**: 571 casos; bajo tratamiento: 1.144; en control pre-tratamiento: 1.090; además con sulfononatropina. 1.729

En los 9 años se detectaron 8.707 casos de los cuales descenso: 13 x 100.000 en 1979 g 5 x 100.000 en 1987. El programa de lucha anti-tuberculosa comenzó en 1979, paulatinamente la monoterapia sulfoníca, pero decidió en diciembre de 1987 la inclusión de rifampicina, a thioamide y dapsone o clofazimine. Las reacciones adversas han sido notadas en un par de pacientes. Tolerado en muchas regiones, algunos efectos secundarios serios han sido observados. Los estudios de bacteriología y histología han demostrado, tanto en el Proyecto Malta como en el de Paraguay, importantes conclusiones. El tratamiento de la lepra incluye la combinación de RMP y Dapsone. El tratamiento de la tuberculosis incluye rifampicina, isoniazida y etambutol. Es importante diferenciar estas reacciones entre las respuestas a la reacción de las bacterias y la respuesta a la terapia de antibióticos.
margins. The bacteriological examination was negative and 
healed and bacteriologically negative. In 1983, he stopped 
treatment and medical visits. In 1986, he returned for a 
reversal reaction with a delay longer than two years. 

The ensuing scheme, thus, will be: 

- 2.5 mg daily every other day for 4 weeks 
- 2.5 mg twice a week every 4 weeks 
- 2.5 mg once a week for 4 weeks. Then, discontinue prednisone treatment and continue with Chloroquine 

This standardized treatment has already been successfully used in isolated areas by experienced leprosy fieldworkers, thus preventing unnecessary additional nerve damage by a delay in transport of the patient to a leprosarium.

**Present address:** Joep Nicolassastraat 402, NL-6041 ZI Roermond

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**LATE ONSET OF A REVERSAL REACTION IN BORDERLINE LEPROSY**

**FLAFSEUIL B., WALLACH D., VICIN M.D., PERNICO, & GUTTERTY F.**

Service de Dermatologie du Pr COTTENOT Hôpital ST-LOUIS 
Paris-France

Reversal or upgrading reaction usually happens during the 3 or 12 first months of antibacillary treatment, how-

ever, previous reports have noted that borderline lepro-

matous patients (BL) may develop reversal reactions over a much longer period but a delay longer than two years is unusual.

We report the case of a Cambodian young male initially 
(1980) classified as borderline lepromatous with posi-

tive bacteriological and morphological index and a nega-

tive lepromin-test. After these three days of a correct daily 
drug therapy by Rifampin (400 mg), Clofazimine (200 
mg), and Ethioamide (250 mg); the patient was clinically 
healed and bacteriologically negative. In 1983, he stopped 
treatment and medical visits. In 1984, he returned for an acute reappearance of cutaneous lesions. On Clinical examination the lesions exhibited the same location and the same morphological aspect than in 1980 excepted for a superficial desquamation and well-defined tuberculoid 

This case typically raises the main diagnosis problem 
that may occur between reversal reaction and relapse.

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**COMPARISON OF COLCHICINE AND ASPIRIN IN THE TREATMENT OF TYPE 2 LEPROSY REACTION.**

**H.K. Kar and H.G. Roy**

Central Leprosy Teaching & Research Institute, Chingleput, INDIA

34 episodes of acute Type 2 reaction in patients with lepromatous leprosy was treated with colchicine (1.5 mg/day x 4) and the response was compared with a similar number of episodes treated with aspirin (1.8 g/day x 4). Both drugs were found equally effective in mild degree reaction, whereas colchicine gave marginally better result in moderate and severe degree reaction. Neither of the drugs was found useful in severe degree reaction. A better efficacy of colchicine was observed in the management of joint and nerve pain associated with Type 2 reaction. Minor side effects like diarrhoea, nausea and vomiting were noted in only one patient while under colchicine therapy.

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**ASSOCIATION OF TUBERCULOSIS IN 10,000 LEPROSY PATIENTS**

S.D. Parkhe

Maharashtra Leprosy Sova Mandal, 16A, St.Francis Avenue, Bandung-400 054, India.

Maharashtra Leprosy Sova Mandal is a voluntary organisation working for leprosy and Tuberculosis control in a part of Bombay. It has over 10,000 cases of leprosy and 6,000 cases of tuberculosis registered. The paper discusses:

1) Incidence of Tuberculosis in leprosy patients.
2) Occurrence of tuberculosis after patients have been put on steroid therapy for reactions and neuritis.
3) Tuberculosis as a cause of recurrent reactions in leprosy.
4) Anti-tuberculosis treatment altering the course of management in leprosy.
5) BM & its problem in cases of leprosy and tuberculosis control.

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**SUDDEN PARALYSIS ASSOCIATED WITH MULTI-DRUG THERAPY - A CAUTIONARY TALE.**

S.W. Parkhe, W.C.S. Smith, P.D. Dawson, M. Solomon, Belgium Leprosy Hospital, Belgium, Karnatak, India and Department of Community Medicine, Bande University, UK.

The use of Multi-Drug Therapy (MDT) was first implemented in 1984. Since then over 2,000 leprosy patients have been treated with MDT. During this time careful attention has been paid to new nerve damage and a series of 67 cases with new, sudden paralysis have been identified. 67.6% of these cases were associated with acute neuritis and 32.2% were silent. 16.5% of the 376 multi-bacillary cases treated developed paralysis compared to only 1.6% of pauci-bacillary cases.

A detailed analysis of the 67 cases has been carried out looking at the number of doses of MDT after which paralysis developed, the muscles affected as well as the recovery time and the order of recovery. All the cases were actively treated with a standard regimen of oral steroids, physiotherapy and leprosy chemotherapy. Paralysis was noted to occur from the first week of chemotherapy up to 2 years in smear negative multi-bacillary leprosy.

New paralysis, both silent and with acute neuritis, is an important complication associated with MDT. It is largely a problem of multi-bacillary leprosy and can occur at any time during treatment. It is essential that these cases are detected early and treated vigorously to prevent permanent nerve damage.

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**PARALYSIS OF THORACIC ESOPHAGUS IN TYPE 1 LEPROSY REACTION REPORT OF 2 CASES**

Dheo Dithai, Chen Zhihui and Ferguson, Jurai Hospital, Shanghai, China

One male patient with borderline leprosy type 1 reversal reaction had involvement of right paraplegic nerve root. The upper part of the thoracic esophagus was paralyzed, the patient had chief complaints of nausea and vomiting after taking food and drinking water. Esophageal Kumar anal examination showed that the lesion stagnated in the upper thoracic esophagus. The upper part of esophagus was obviously enlarged. Peristalsis of the esophagus had disappeared.

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Early leprosy lesions - Presentation and Progress

B. Mishra, A. Mukherjee*, A. Girdhar and B.K. Girdhar
Central JALMA Institute for Leprosy,
Taj Ganj, AGRA-282001, [INDIA].

*Institute of Pathology, Safdarjung Hospital,
P.O. Box#909, NEW DELHI-110029, [INDIA].

For successful containment of leprosy early diagnosis is utmost essential. With increasing awareness of the population about early signs and symptoms of leprosy, the number of such cases presenting for diagnosis and treatment is bound to swell up in coming years.

Present study is based on analysis of records of such cases who presented themselves at JALMA with sensory and motor symptoms. These cases were observed regularly. Later on some of these manifested two or more cardinal signs of leprosy. A percentage of such cases developed neuritic leprosy. A number of these cases further progressed to a clinical borderline disease.

Since many a times a serological diagnosis of leprosy is difficult, these positive neurological manifestations tell their own significance. This paper describes the evolution of leprosy lesions and discusses the place of neuritic leprosy in spectrum of the disease. A new model for evaluation of leprosy lesions has been suggested.

PO 410

VALIDATION OF SINGLE MACULE IN PAUCIBACILLARY LEPROSY AS AN INDICATOR OF EARLY DIAGNOSIS AND OF PROGNOSIS

Murielle Deguey, Claudine Misson, Etienne Declercq, Claire Vellut.
Epidemiology Unit, Catholic University of Louvain,
Brussels, Belgium.

The number of macules is usually registered at diagnosis. In the first clinical exam of leprosy patients, the question studied here is whether this practice is of any interest as an indicator of the proximity of detection or the prognosis.

From 1973 to 1983, 4706 patients were registered in Bolanhakkon leprosy Centre (South India). Of these cases, 3106 are included here, that is the paucibacillary cases. The question studied here is whether this practice is of any interest as an indicator of the prognosis.

Except for the first two years where a lot of missing values regarding macule status were found, the trend of the proportion of single macule patients per year was similar to the trend observed for the proportion of patients without disability.

The relationship between age at detection and number of macules has also been analyzed.

To see whether the number of macules at detection could be used as a prognosis indicator, duration of treatment before inactivation and relapse rate were compared between patients with single and with several macules.

PO 411

AN ATTEMPT TO DEFINE INDETERMINATE LEPROSY.

Dept. of Dermatology, Venereology & Leprosy, SMS Medical College, Jaipur, India.

To define what is indeterminate leprosy we randomly selected 26 patients presenting with hypopigmented lesions from our leprosy clinic. They were further grouped into 3 sub groups. Gr. I had patients with well defined single patch with moderate to complete sensory loss. In Gr. II patients had single lesion but ill defined border and partial sensory loss, whereas Gr. III had patients with multiple ill defined lesions and doubtful sensory loss. All these patients were subjected to clinical charting, histological examination and lepromin test. Epidermal atrophy was common finding in all the groups. Presence of granuloma formation and nerve involvement was seen only in Gr. I, whereas in Gr. II and III only linear infiltrate in upper dermis and periappendicular region was seen. In none of our cases we could see changes suggesting dermatitic process. Our findings strongly suggest that patches which are well defined and present granuloma formation should be excluded from indeterminate group and should be labelled as maculoaesthetic or macular tuberculoid. To label a case as indeterminate, apart from clinical presentation there should be epidermal atrophy and perineural lymphocytic infiltration.

PO 412

DEVELOPMENT OF A PORTABLE TESTER FOR TESTING THERMAL SENSATION FOR USE IN THE DIAGNOSIS OF LEPROSY

Mr. B. Stumpe, Dr L. Lopez-Bravo and Dr S.K. Roodeen
European Organization for Nuclear Research (CEBN) and Leprosy Unit, World Health Organization (WHO), Geneva.

In the diagnosis of early leprosy testing for several modalities of sensation is more advantageous than testing for just one modality. As regards testing for thermal sensation, there is a definite need for an appropriate and simple device, particularly for use in the field. WHO, in collaboration with CERN, has been able to develop such a device.

A small portable robust instrument, similar in appearance to a pen light and which is ready for use within seconds, has been developed. The final version, which emerged after field testing several versions, has a probe head diameter of 7 mm and operates on two type A pen light batteries of 1.5 volts or two rechargeable batteries of 1.2 volts allowing several hours of continuous testing. The electronics, using a specially developed semi-conductor component, control the probe head temperature according to varying ambient temperatures. For instance, at an ambient temperature of 30°C the probe head is capable of reaching 45 to 50°C.

Field testing of the current and earlier versions of the thermal tester has shown that the addition of thermal sensory testing increases the ability to diagnose early leprosy. In a proportion of early lesions the only modality of sensation lost was thermal. The instrument has been found sturdy enough for use in the field.

PO 413

THE SIGNIFICANCE AND USEFULNESS OF VOLUNTARY MUSCLE TESTING IN LEPROSY CONTROL.

Mazloomali S., Sujal Sunetan, and Eroon C. Udaiyap.
Ethiopian Leprosy Research Centre, Karwan, Hydroabad-6 INDIA.

Voluntary Muscle Testing (VMT) was performed routinely and graded according to the Medical Research Council (MRC) grading in the leprosy patients registered at the Ethiopian Leprosy Research Centre. Among the 2122 patients retested from 1982-87 recent nerve damage was detected in 353 cases. This involved a total of 611 nerves. The details will be discussed. In the case of Ulnar nerve, two muscles were tested and the VMT's added to get the 'Nerve Score' (maximum 10). In the case of Median nerve where only one muscle was tested, the VMT was doubled to get the 'Nerve Score'. This principle was also applied to other nerves tested. Majority of the cases (44%) had a nerve score ranging from 6-9 at the time of detection, which means that they would have been missed by the simple tests for field use such as those which advocate tests like postioning of hands in Dancing position to detect Ulnar/Median/Radial Paralysis, Tillying the foot for LSF, Palpitation of the ulnar and median nerve. These tests may fail to detect patients with muscle power of 0, 1, 2 and 4.
Hence, the study indicates the urgent need to incorporate VDT as a routine test in all patients of Leprosy in order that we may detect early, treat adequately and follow-up recent nerve damage.

POST-KALA-AZAR DERMAI LEISHMANIASIS (PKDL) SIMULATING LEPROSY - A CASE REPORT

A.C. Parikh, N.R. Fernandez and R. Ganapathi
Bombay Leprosy Project, Bombay, India.

Leishmaniasis is reported from all continents except Australia. It is endemic in some parts of India and Africa. However, review of literature revealed very few case reports of PKDL simulating leprosy.

A 45 year female presented with skin lesions of ten years duration. She was partially treated for kala-azar 13 years ago in Patna, Bihar a state hyperendemic for this disease. After she migrated to Maharastra State she was treated as a case of leprosy for three years before she reported to us.

She had bilateral asymmetrical well defined hypopigmented patches with normal sensation. Erythematous plaques and nodules were present on the face, hands elbows and ankles. Peripheral nerves were not thickened.

Skin smears for AFB were negative. Skin histology showed dense macrophage granuloma. LD bodies were demonstrated by Giemsa stain. Bone marrow aspirate cultured on NNN media showed growth of anastigote demonstrated by Giemsa stain. Bone marrow aspirate showed dense macrophage granuloma. LID bodies were present as a class of leprosy for three years before she reported to us.

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The intra-observer variation was not significant. Many a time discrepancies were due to faulty techniques. Each step from smear preparation to reading must be standardized to make the cross-checking unambiguous and meaningful. A retrospective analysis showed that three smears instead of six is adequate for Programme. This may include one ear lobe and two active sites. The right and left ear lobes behave similarly. Taking smears from fore-head, chin and buttocks is not welcomed by the patients. The sites like thigh, arm and back were found to be equally good.

The authors report two cases of tuberculosis cutaneous, one case being disseminated and the other limited to the right forearm and hand, both of which were initially diagnosed as Tuberculous leprosy. In the disseminated case the clinical hypothesis of Tuberculosis leprosy was corroborated by a histological diagnosis with the same conclusion. The two cases were sent to us to begin specific treatment.

In presenting these two cases, the authors hope to reaffirm the importance of the differential diagnosis in the day to day practice of dermatology.

STUDIES ON SKIN SMEAR EXAMINATION IN RELATION TO M.D.T. PROGRAMME

V.N. Bhalla, Shashikala Rao, T.V. Elango, M.H. Padma, Sari-
krishnan and P. Strubhan
Central Leprosy Teaching and Research Institute,
Chengalpattu-603001, Tamil Nadu - India.

Skin smears examined end to end gave higher BI than routine. Some additional positives were detected. The bacilli were found to be distributed irregularly in the smear. The low BI smears required more thorough microscopical examination. The intra-observer variation was not significant. Many a time discrepancies were due to faulty techniques. Each step from smear preparation to reading must be standardized to make the cross-checking unambiguous and meaningful. A retrospective analysis showed that three smears instead of six is adequate for Programme. This may include one ear lobe and two active sites. The right and left ear lobes behave similarly. Taking smears from fore-head, chin and buttocks is not welcomed by the patients. The sites like thigh, arm and back were found to be equally good.

Llucio's Leprosy
Oshluta Rodrigo
centre Dermatologico Paeuc, Secretaria de Salud. Mexico, D.F.
Mexico.

Llucio's Leprosy is a variety of lepromatous leprosy, called "spotted" or "lazarian" by de las Puecas (1844), described with those names by Lucia and Alvarado (1852) and identified by Lafage in 1936. Clinical features: Skin generalized infiltration, numb or atrophic, without nodules. Telangiectases on the face and chest, rosacea-like appearance of the face, silva cyes (advanced cases) and edema of the limbs (early cases). Limite, saddle nose. Slow but total alps, eyebrows and down hair alopecia. Pan-
nectita, Impairment of sensation over whole body. Tog-
coral lesions and a special kind of lepra reaction: "erythema necroticans" with Llucio's phenomena, chills, high fever, insomnia...

Bacteriologically: Plenty bacilli not only in nasal but in any part of the skin. Histologically: Lepromatous infiltrates in small focus around vesicles, nerves and appendages. Infiltrates are more dense in deep dermis and hypoderma. During lepra reaction: epidermal necrosis, perivascular bullae and ulceration. Vascularitis with thrombosis of small and medium caliber blood vessels, surrounded by polymorphonuclear focus with numerous bacilli. Immunologically: Leprosy reaction is always negative, but 4-6 hours after injection of 0.01 ml lepromin, the Llucio's phenomenon is first
stages is reproduced. VDRL is positive in almost all cases.

Prognosis: It is the most serious form of leprosy. Treatment: Sulphones, rifampicin and clofazimine are more effective in these cases than in nodular ones.

Classification of cases.

Oblada Rodriguez.
Concepcional Pascua.
Secretaría de Salud, México, D.F. México.

The concept of leprosy is at present quite different from the former years ago. In add two "polar" types of the disease (Rabello Jr., 1938): Lepromatous and Tuberculoid, totally antagonistic, progressive and spontaneously incurable the first one, and progressive and naturally curable the second, no doubt, has contributed on it.

In spite of the advances that have been achieved in the last years, appropriate classification of cases continue to be an important aspect of leprology, since the diagnosis, the understanding and the management of the patients depend on it. A brief historical review of the subject is done in this paper with special reference to the Havana and Madrid Classifications. This last one, accepted at the present as the International one.

Ridley and Jopling approach is taking into account, and it is emphasized that it does not multiply polarity conception as many assume, on the contrary, not only complements it, but also strengthens it. On the other hand, it is difficult to admit that all cases begin indeterminate as Ridley and Jopling affirm, because in that case infantile tuberculoid leprosy, and pure and primitive diffuse lepromatous leprosy would be out of the spectrum.

The author thinks that the two polar types: Lepromatous and Tuberculoid should result, and also the indeterminate group, but she considers that too much importance has been given to the borderline cases. They are not as frequent as some people believe. They are always secondary to the indeterminate ones, and they are only an evolutive stage of the two polar types: Lepromatous and Tuberculoid.

Sign of Differentiation between P.Alba and lesions of leprosy on the face in children.

R. D. Kharar, Jayadas Chacko
M.M.B. Hospital Lokahita Seva Mandal,
16A, St. Francis Avenue, Ilayamb-400 054, India.

Study of 500 school children.

Combined immuno- and chemotherapy of leprosy in nude mice.

R.K. Banerjee and R.D. McGregor-Lancaster
Department of Medical Microbiology, St. George's Hospital Medical School, Cranmer Terrace, London, SW17 0RE, U.K.

In order to explore the effect of combined immuno- and chemotherapy, nude mice were infected by footpad inoculation and treated with rifampicin (RMP) and dapsone (DQD) in conjunction with once a week dose of 1000 P. recomb. r-interferon (r-IFN). Period of treatment consisted of two months starting 30 days after infection until 90 days. Groups of animals were harvested each month starting on the 6th month until 15 months. Footpad counts were determined on the homogenate following staining by acid fast stain. DOS at both inhibitory (0.001%) and ten times inhibitory (0.0001%) levels failed to show any synergy while used in conjunction with r-IFN. RMP at subinhibitory dose failed to show any synergy but at 0.006% along with r-IFN produced a highly significant growth delay in comparison with RMP alone at that level. These results will be discussed.
PERIPHERAL NERVES IN EXPERIMENTAL IMMUNOTHERAPY

A. Gupta and M.C. Vaidya
Cellular Immunology Lab, Department of Anatomy,
All-India Institute of Medical Sciences,
New Delhi, India.

Though the clinical manifestations of leprosy become apparent on the skin, it remains a disease primarily of peripheral nerves and Schwann cells. Ever since the leprosy and mycobacterium leprae have been known, tremendous efforts are being made to study the pathogenesis of the nerve lesions and the nature of the neuropathy is not clearly understood. In the present paper an attempt is made to observe the effect of immunotherapy after a period of five months on the peripheral nerves in the mouse foot-pad model.

20 immunosuppressed mice (C3H/HeN) with established leprosy infection and 10 thymectomized/irradiated mice without infection were transfused intravenously with syngeneic 10^6 and 2 x 10^6 T cells once a week for four weeks. No specific effect on the peripheral nerves could be observed. However, initially three months after the transfusion, the lymphocytes were found around the perineurium of the cutaneous and peripheral nerves, yet the chain of events, precise pathogenesis of the lesion and the nature of the neuropathy is not clearly understood. In the present paper an attempt is made to observe the effect of immunotherapy after a period of five months on the peripheral nerves in the mouse foot-pad model.

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A series of novel diaminopimelic acid analogues have been designed as broad spectrum anti-mycobacterial agents. Some of the compounds are currently being screened in vivo against a wide range of mycobacteria in Antwerp and London. The design strategy, methods of synthesis and drug testing results will be reported. Active compounds identified in these tests will be prepared in sufficient quantities for testing against M. leprae in the mouse foot-pad.

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2.4-DIAMINO-5-BENZYLPYRIDINES AS INHIBITORS OF M. LEPRAE DHFR REDUCTASE

Manfred Kabay, Joschkin K. Geydel, Michael Wiese
Borsetel Research Institute, D-2561 Borsetel, FRG

The inhibitory activity of commercially available DHFR-blockers like triethoprim (TMP) which is highly active against gramnegative bacteria is disappointingly low against grampositive strain of mycobacteria.

In course of our studies to design inhibitors of mycobacterial DHFR using M. lufyi-DHER as a model for the M. leprae-DHER we noticed that TMP - which is inactive in whole cell systems - is a potent inhibitor of the isolated DHFR enzyme.

These results demonstrate two aspects:

1) The structures of DHFR could be quite similar.

2) Different cell-vals might be responsible for the great difference in whole cell inhibition activity (MIC).

Knowing the 3-D-structure of E.coli-DHFR as a model and the results of Kyper et al.(1) and including new techniques of computer graphics we tried to develop new inhibitors of mycobacterial DHFR. Several of these derivatives show a higher activity against the enzyme as compared with TMP and in addition could permeate the mycobacterial cell wall. The most active of these new compounds is the derivative K-130 (IC50 = 0.034umol).

Reference (1):

A series of clofazimine analogues active against D. leprae in vitro and in vivo and active against a clofazimine-resistant M. lepra in vitro.

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Abstracts of Congress Papers

57, 1 (Suppl.)

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ANTIBACTERIAL ACTIVITY OF SEVERAL FLUOROQUINOLONES AND

CLINICAL TRIAL WITH DEOXYFRUCTOSEROTONIN [DFS]

on amount of drug administered per body weight. 0-flora-

Stefaan P. Pattyn,

Leptosy Laboratory, Institute of Tropical Medicine

Antwerp, Belgium.

In the proportional bactericidal test (PBT) and based on

amount of drug administered per body weight 0-flora-

565 10, 57, 1 (Suppl.)

References to antileprosy agents show activity against M. leprae, when fed to the animals at 0.012 in the diet.

T.M. Shinnick,

Centers for Disease Control, Atlanta,

U.S.A.

The paper discusses the findings of the trial and the possibility of incorporating DFS with immunosuppressive components of multidrug therapy like dapsone and rifampicin for faster bacterial clearance. It may also be used in the treatment of cases resistant to one or more drugs used presently in multidrug regimens.

The compounds have shown to have growth inhibitory activity against human-derived M. leprae in murine macrophages in culture. In the mouse foot pad test, some of the agents show activity against M. leprae, when fed to the animals at 0.012 in the diet.

The compounds inhibiting PGL-I synthesis also have proven effective when compared to previous data reported in this footpad system. This correlation lends support to the feasibility of using these in vitro systems which measure a specific marker metabolite of M. leprae for the rapid evaluation of new drugs against leprosy.

IN VIVO BIODEPONIES OF PFL AS A RAPID TEST FOR THE EVALUATION OF NEW DRUGS AGAINST LEPROSY.

A 12 mois par l'amélioration d'une part des nerf-

A 6 mois par la guérison des rhinéses dans 100 %

A 10 rhinéses nouveaux lépreux (DLN) inci-
New inhibitors of mycobacterial dihydrofolate reductase (DHFR) have been developed in our laboratories. They were tested in cell-free extracts of the cultivable mycobacterial strain M. lufti to test the interaction with the target enzyme. M. lufti shows similar sensitivities to forwards folate inhibitors as compared to M. leprae. The inhibition of whole cells was determined by MIC tests using various mycobacterial strains. The results show that benzamides can be powerful inhibitors of mycobacterial DHFR but that in addition special structural requirements are necessary for cell-wall permeation which are not present in trimethoprim but in brodimoprim (BDP) and especially in K-130. These inhibitors show strong synergistic effects in combination with dapsone and other drugs. The in vitro results are in excellent agreement with those from mouse foot pad experiments. BDP stopped multiplication of M. leprae at a diet concentration of 0.1 % and in combination with dapsone (0.001 %) at 0.05 % BDP. After 4 months treatment with 0.02 % K-130 alone no viable M. leprae were detected. Relapse controls remain negative. Pharmacokinetic data provided for BDP in man are also presented.

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IN VITRO EFFECT OF RHODAMINE-123, DMSO INTOXYGENATE AND T-HELPER CELLS

E. L. Shamova and R.C. Hollings. Laboratory Research Branch, Gillis W. Long Hannens' Disease Center, Carville, Louisiana 70721, U.S.A.

As identified by fluorescence conjugated anti-Leu-3 monoclonal antibody (MAb), a significant reduction in Leu-3-bearing mononuclear cells (MC) was noted in human beings receiving 100 mg daily doses of thalidomide. The reduction was noted in both the percentage of T helper/inducer population of MC and their absolute numbers in vivo; no reduction was seen in either the percentage or in absolute numbers of Leu-3-bearing T cells as detected with Leu-1, anti-Pan-1 MAb. The possibility of using thalidomide was investigated in vitro.

One x 10^6 mononuclear cells in 300 ul of RPMI-1640 with 20% fetal calf serum (FCS) and 0.016 mg/ml sodium azide were incubated with 10 ul of thalidomide dissolved in DMSO. The stock solution of thalidomide was prepared fresh and contained 1 mg of thalidomide in 10 ml DMSO. Mononuclear cells not treated with thalidomide received 0.016 mg/ml DMSO. The cells were incubated at 37°C for 1 hr and washed once with 2.5 ml of RPMI-1640 for each wash. The pelleted cells were resuspended and incubated with the manufacturer's recommended concentration of FCS. This was usually 1 ml of 20% DMSO in 20 ml. After one hr incubation at room temperature, the cells were analyzed on a Coulter Fluorescent activated cell counter (FAC) FACS. The percentage of fluorescent cells detected after reacting 3 x 10^6 mononuclear cells did not differ significantly in the thalidomide-treated group compared to the group not receiving thalidomide. The intensity of fluorescence of the T cells, T suppressor and T-helper cells appeared to be similar hence thalidomide in vivo conditions had no effect on their surface antigen profile.

HETEROCYCLIC HYDRAZONES, INHIBITORS OF M. LEPRAE

K. J. Schaper, 1, A. M. Hopkins, 2, J. K. Seydel 1 and M. Kansy 1

1 Borstel Research Inst., D-2061 Borstel, FRG
2 Medical Research Inst., FIT, Melbourne, Victoria 3200, USA

Starting with 2-acylidinethiosemicarbazones a new class of highly active antileprobiotics (derivatives of 2-acylpyridinethiosemicarbazone, 1) has been developed. These compounds are analogues of the bacterial ribonucleotide reductase and show strong synergistic potentiation of the inhibition of whole cells of M. leprae. The inhibition of whole cells was determined by MIC tests using various mycobacterial strains. The results show that benzamides can be powerful inhibitors of mycobacterial DHFR but that in addition special structural requirements are necessary for cell-wall permeation which are not present in trimethoprim but in brodimoprim (BDP) and especially in K-130. These inhibitors show strong synergistic effects in combination with dapsone and other drugs. The in vitro results are in excellent agreement with those from mouse foot pad experiments. BDP stopped multiplication of M. leprae at a diet concentration of 0.1 % and in combination with dapsone (0.001 %) at 0.05 % BDP. After 4 months treatment with 0.02 % K-130 alone no viable M. leprae were detected. Relapse controls remain negative. Pharmacokinetic data provided for BDP in man are also presented.

As drug development has been performed using leprosy model strains (M. lufti, M. smegm., M. marium, M. tuberculoide) the effect of several derivatives of (I) on M. leprae was tested in vitro by measuring their inhibitory activity on ATP production and 3H-thymidine uptake of M. leprae. The most promising compound of this step was synthesized in larger amounts and tested in vivo. Inhibitory effect on the in vivo multiplication of M. leprae was tested in mice by mouse foot pad tests. At a concentration of 0.1 % in the food of mice I-26 significantly reduces the multiplication of M. leprae. Similar experiments were started with additional derivatives and with combinations of I-26 with compounds previously shown to be synergistic potentiators.

PO 439

A NEW GROUP OF CHEMICAL COMPOUNDS WITH ANTI-LEPROSY ACTIVITY.

N.G. Urlysheva, A.A. Suschenko, V.V. Simonov

Leprosy Research Institute, A.A. Borstel, FRG, and USSR.

Antileprosy activity of new chemical compounds belonging to the derivatives of polychlorocarbonic acid has been studied. Several compounds out of 37 showed a marked ability to suppress the multiplication of M. leprae in mice fed with the compounds studied. M. leprae of the most effective derivatives of polychlorocarbonic acid equal 0.012-0.06005'.

The kinetic method showed that after withdrawal of the compounds under study M. leprae multiplication in mice foot pad did not recommence, suggesting the bactericidal properties of the compounds. The dependence of the antimicrobial effect and toxicity of the derivatives of polychlorocarbonic acid on their chemical structure was found out. Three compounds (laboratory codes 202, 203 and 205) proved to be the most suitable for therapy of leprosy patients. The possibility of using compound N 202 in combination with dapsone was studied. The data obtained demonstrated satisfactory synergistic action of the compounds and increased antimicrobial effect of the combination. The prospects of developing a new antileprosy drug based on polychlorocarbonic acid are being discussed.

This investigation received a financial support from USP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases.
The objective was to measure the bactericidal activity of monthly doses of rifampicin (RMP) against Mycobacterium leprae in man. Twenty nine previously untreated lepromatous patients were randomized to receive 2 doses of either 600 mg (14 pts) or 1200 mg (15 pts) RMP at days 0 and 28. Bacilli from skin biopsies were inoculated into mouse foot pads on days 0, 7, 28 and 35 to determine the viability of the bacteria. The pretreatment biopsies were infective for more than 50% of the mice inoculated. In 11 pts receiving 600 mg and 10 patients receiving 1200 mg. All later biopsies were noninfective for mice except one at day 28 in a patient who took 600 mg of RMP.

It is concluded that monthly doses of 1200 and 600 mg RMP, the latter being part of the WHO treatment regimen, renders M. leprae non infectious for mice within less than one week.
of management of prevention and treatment of insensitive foot problems. These algorithms include risk categorization of uninjured patients, classification of soft tissue injury and management of neuropathic fractures.

Postproblems in a mountainous country like Nepal.

Anandaban Leprosy Hospital, The Leprosy Mission Int., Nepal.

An analysis is presented of postproblems in leprosy patients in Nepal. New types of footwear are presented.

MICROCOMPUTER BASED ANALYSIS OF FOOT PRESSURE IN ANAESTHETIC AND DEFORMED FOOT OF LEPROSY PATIENTS
K. M. Pujil, I. Galaja, C. Edwaran and K. S. Rau
Biomedical Engineering Division, Department of Applied Mechanics, Indian Institute of Technology, Madras - 600036

India

This paper describes a microcomputer based analysis of foot pressures in anaesthetic and deform foot of leprous patients. In this method, light images of the foot print are obtained by breakdown of total internal reflection of light on a device called barograph. The intensities in the image are related to the pressures under the feet of a subject standing on the barograph. The image is digitized using a video digitizer and analysed for foot pressure pattern using software developed for the purpose. The pressure patterns are presented in the form of zonal grey scale, or three dimensional pattern along the length and breadth of each foot giving more details of minute pressure changes which could be useful for clinical and diagnostic use, the centre of foot pressure (CFP) for both the feet and regional CFP for each foot is available for export:

An analysis is presented of foot problems in leprosy patients in Nepal. New types of footwear are presented.

2. Samples of protective footwear from different countries that is not for sale, but that might be copied and/or modified for use in other situations.

3. Patterns and sewing instructions for standard-sized sandals, with prices and addresses of manufacturers.

4. Samples of micro-cellular rubber from different sources, with prices and addresses of manufacturers.

5. Samples of useful articles and pamphlets relating to protective footwear.

FIELD EXPERIENCE WITH PERSONALISED GRIp- AIDS FOR LEPROSY PATIENTS
Kennott M. Westmacott
Handicapped Education and Aid Research Unit (HEARU), City Poly, United Kingdom

Community based rehabilitation programmes are developing in many countries of the world. In the future there will be potential for rehabilitation even in very rural areas by means like the given Grip Aid Programme developed jointly between NIMH and CIMA-GEIGY Ltd.,Basle, designed for use by paramedics. The challenge: Leprosy field workers have a full programme which necessitates concentration on curative work. Very individualised hand-grips or footwear are necessary in the management of patients with disabilities resulting from leprosy. The results of the field studies underway in Ethiopia, India, England and Pakistan will be presented. The grip-aids material used in these studies is based on a two component epoxy putty and allows patients to mould their own made-to-measure grip-aids under medical and/or paramedical supervision. The purpose of these studies is to determine the practicability of the use of grip-aids in patients with deformed hands. These grip-aids will be made available internationally by CIMA-GEIGY Ltd., Basle, in 1989.

CARVABLE SILICONE PROSTHESES FOR FIRST WEB IN THE HAND
Marcos Virmond & Frank Duersken P.R.C.S.
Secretaria da Sulde do RS - Brazil / ALM

Musscular atrophy of the first web is a common finding following ulnar palsy in the hand and this deformity is stigmatized especially among Hansen's diseased patients. We present a technique for cosmetic restoration of the first web with an individual silicone implant carved out from a soft silicone block. The procedure includes an incision following the interdigital line of the first web and a pocket that is created by blunt dissection between the paralysed adductor pollicis and the first dorsal interosseous. A piece of silicone is cutted out the main bloc and is carved in a funnel form shape. The piece is introduced into the pocket which is closed with fine nylon sutures. A plaster cast is applied. We discuss the procedure, results and its advantages compared to other techniques such as dural grafts and teat section prostheses. We believe that this is an efficient method because it is cheap, easy to perform and have a low incidence of complications.
For the last two years we have been using prefabricated splints standardised by us. Application of prefabricated splints is easy and feasible even in the field work. Splinting help as temporary support during acute neuritis, during recovery while patient is on steroid therapy and following release of compression neuropathy by decompression of fibrous tunnels or along with epineurotomy. In established mobile deformity it strengthens the extensor expansion, provides assistance to lumbricales and prevents adductor contracture. In long standing cases it corrects the joint stiffness and strengthens the voluntary muscle power. Following reconstructive surgery splints are necessary till the transferred muscle tendon unit is able to perform properly and reeducation pattern is established. Different, standardised, prefabricated splints were provided to 150 patients. The method of making patterns of the minimum standardised, prefabricated splints were provided to 150 properly and reeducation pattern is established. Different, standardised, prefabricated splints were provided to 150 patients. The method of making patterns of the minimum standardised, prefabricated splints were provided to 150 properly and reeducation pattern is established. Different, standardised, prefabricated splints were provided to 150 patients. The method of making patterns of the minimum standardised, prefabricated splints were provided to 150 properly and reeducation pattern is established. Different, standardised, prefabricated splints were provided to 150 patients.
This paper will review U. potential importance of this and other developments related to drug utilization in U. overall context of Philippines and later in Thailand and India.

Blister packs (BP) have recently been designed for the administration of multi-drug treatment (MDT) along the lines recommended by the World Health Organization for the treatment of all forms of leprosy. In late 1987 a controlled trial was initiated in Thailand to establish if BPs have significant advantages over the usual presentation to the patient of "loose" drugs, and to assess its influence for the implementation of MDT in leprosy control staff.

A total number of 400 patients will be entered into the study, and divided into a group of different schemes of drug supply ("loose" versus blister) and health services ("integrated" versus "sectorial"). Cases are followed for six months period, during which compliance and motivation is measured through a variety of assessment techniques. To data (February 1988) one hundred and seventy-nine patients have been admitted to the project. Sixty eight are using blister packs, 57 in vertical and 11 in integrated areas, one hundred and eleven cases are in the loose drug regime, 44 in vertical and 64 in integrated areas.

We review the data on compliance and patient motivation in each of the four cells, in those patients for whom data is complete, and compare the early motivation of the leprosy control team in each cell.

Blister calendar packs for the presentation of dapsone, clofazimine doses, are available at the outset and during the entire duration of the program. On an absolutely regular basis.

Improvement of health staff performance for this purpose call for attention to "a package" of activities, including accurate diagnosis and classification, skillful and sympathetic handling of patients and their families and a broadly-based plan of health education for the community. Even where all this has been achieved, implementation will fail unless all the necessary drugs, in both adult and child dose, are available at the outset and during the entire duration of the program, on an absolutely regular basis.

Sticky calendar packs for the presentation of dapsone, clofazimine and rifampicine may be of value in this context. Following a publication by Winsley et al in the 1981 (51, Number 4, pp 592-594), giving detailed designs, blister packs have been used quite extensively, first in the United Kingdom, in the early 1980's. The method is applied to the analysis of data about compliance data in case repeated observations of compliance were made in two groups of patients (compliers and non-compliers and analysed which other differences existed between these two groups.

From multidisciplinary patients also at month 12, 18 and 24.

We identified groups of typical compliers and non-compliers and analysed which other differences existed between these two groups.

Most Hansen's disease patients have the ability to continue their medication while others don't. Is it because one feels there is simply no need of continuing? Perhaps one feels the need for a different dosage or a change of drugs. Ultimately, compliance requires a good doctor/patient relationship with good rapport and confidentiality. One hundred percent dominance by the doctor can be disastrous. Good communication between equals can avoid a breakdown that leads to non-compliance.

There is often times a strong resistance to continued medication and a rigid routine over a long period of time which can conflict with one's desire to do right. To certain patients, compliance becomes defiance. Non-compliance becomes a way to feel some sense of control over one's life, even if it results in hurting oneself.

Defiance can take the form of stubbornness, neglect and a failure to compromise which can lead to total disaster. Most patients feel that if you need the medicine, take it; if you don't, don't. To really understand compliance, one must understand full well what it means to stay on what seems like a plateau for years at a time.
WHO in 1982. An injectable depot formulation of dapsone was used as a part of an MDT programme among 52 leprosy outpatients in two leprosy clinics in Jos, Plateau State, Nigeria. The injection was administered with intervals of 4 weeks. Blood samples were taken at regular time intervals during the first four months to follow the dapsone serum concentration. Also a questionnaire was obtained to evaluate the acceptability of the treatment.

In general, the injection was well received by the patients. The overall attendance was 91% and only 3 female patients did not complete the study for reasons not related to the treatment. In one male patient an abscess occurred, otherwise local side effects were restricted to a slight tenderness at the injection site in some of the patients, which never lasted longer than a week. Of 44 patients asked, 39 preferred the injection to daily oral treatment, because of the convenience of the regimen and an improved general well-being. Two patients preferred oral therapy. Concerning the dapsone serum concentration/time profiles and the favourable judgement of the patients, the dapsone depot injection provided a useful tool against non-compliance among leprosy patients.

### PO 464

**THE ATTITUDE OF NIGERIAN LEPROSY OUT-PATIENTS TOWARDS THE USE OF A DAPSONE DEPOT INJECTION**

F. A. M. Pieters and Jan Zuidema

Department of Biopharmaceutics, University of Amsterdam, Amsterdam, The Netherlands

Widespread patient non-compliance has lead to the concept of a sustained release formulation of dapsone that can be implemented in the MDT programme as recommended by the WHO in 1982. An injectable depot formulation of dapsone was used as a part of an MDT programme among 52 leprosy outpatients in two leprosy clinics in Jos, Plateau State, Nigeria. The injection was administered with intervals of 4 weeks. Blood samples were taken at regular time intervals during the first four months to follow the dapsone serum concentration. Also a questionnaire was obtained to evaluate the acceptability of the treatment.

The injection appeared to yield good sustained release results throughout the study period. The mean trough dapsone serum concentration was 0.4 mg/ml, while none of the 816 samples contained more than 3.0 mg/l dapsone. Accumulation occurred after repeated administration.

In general, the injection was well received by the patients. The overall attendance was 91% and only 3 female patients did not complete the study for reasons not related to the treatment. In one male patient an abscess occurred, otherwise local side effects were restricted to a slight tenderness at the injection site in some of the patients, which never lasted longer than a week. Of 44 patients asked, 39 preferred the injection to daily oral treatment, because of the convenience of the regimen and an improved general well-being. Two patients preferred oral therapy. Concerning the dapsone serum concentration/time profiles and the favourable judgement of the patients, the dapsone depot injection provided a useful tool against non-compliance among leprosy patients.

### PO 465

**COMPARATIVE STUDY OF BLOOD AND URINE LEVELS.**


**Department of Physical Education, University of Natal, South Africa**

Many years and various methods have been used to measure and increase patient compliance. Urine spot tests for monitoring dapsone intake have now been widely used for a number of years. This study compares the results of urine spot tests for dapsone as proposed by H.C.J. Huikeshoven, with blood levels measured in the same patients by the modified Creatin Marshall colorimetric method, and by high performance liquid chromatography. Approximately 300 specimens were obtained from patients who were taking supervised and unsupervised medications, as well as from controls who were taking no medications. The results indicate that the urine spot test is as accurate a measure of patient compliance for clinical purposes as blood levels done by the colorimetric method, and correlates well with blood levels done by high performance liquid chromatography. It was also shown that blood levels for dapsone as a means of monitoring patient compliance are not useful in patients taking daily rifampicin because rifampicin alters the dapsone blood levels significantly. Urine spot tests, however, remain useful as an indicator of dapsone intake in such patients.

### PO 466

**MONITORING DAPSONE LEVELS FOR PATIENT COMPLIANCE, A COOPERATIVE STUDY OF BLOOD AND URINE LEVELS.**

Leo Yoder, Marion Guttrau, and Robert Jacobson

**Gillis W. Long Hansen's Disease Center, Carville, Louisiana, U.S.A.**

Regularity of drug intake and patient compliance has been an ongoing concern of leprosy control programs for many years and various methods have been used to measure and increase patient compliance. Urine spot tests for monitoring dapsone intake have now been widely used for a number of years. This study compares the results of urine spot tests for dapsone as proposed by H.C.J. Huikeshoven, with blood levels measured in the same patients by the modified Creatin Marshall colorimetric method, and by high performance liquid chromatography. Approximately 300 specimens were obtained from patients who were taking supervised and unsupervised medications, as well as from controls who were taking no medications. The results indicate that the urine spot test is as accurate a measure of patient compliance for clinical purposes as blood levels done by the colorimetric method, and correlates well with blood levels done by high performance liquid chromatography. It was also shown that blood levels for dapsone as a means of monitoring patient compliance are not useful in patients taking daily rifampicin because rifampicin alters the dapsone blood levels significantly. Urine spot tests, however, remain useful as an indicator of dapsone intake in such patients.

### PO 467

**THE IMPORTANCE OF PATIENT COMPLIANCE IN THE CONTROL OF LEPROSY.**

G. A. Eilert

**National Institute for Medical Research, The Ridgeway, Mill Hill, London NW7, U.K.**

Since leprosy, like tuberculosis, is a disease in which child cases are generally non-infectious,
the most effective method of controlling its transmission is through improved case-finding and treatment rather than by vaccination. The multidrug treatment regimens recommended by the WHO are extremely well tolerated and highly effective if regularly delivered to the patient and then ingested. However, if multidrug treatment regimens fail to ingest the dapsone, anaphylactoid reactions can occur. Recent studies of patients with drug-resistant leprosy have reappeared. This is confirmed by a review of the literature and a survey of leprosy treatment centres in 1985. Further surveys have now been conducted in 1986 and 1987 and the situation assessed. The hyperreaction reaction continues to occur in a sporadic fashion. Possible underlying factors are discussed.

Multidrug therapy and pregnancy: Preliminary report on toxicity.

José Luiz de oliveira Gomes, Maria del Pilar Riot and Dominic Kornsot
Centro de Saúde Washington Luis, São Gonçalo, Rio de Janeiro, Brazil.

In 1983 a study on MDR as recommended by D.M.S. was initiated in the Curupaiti State Hospital. We have observed the side effects of the drugs most frequently used, with special attention to our female patients who become pregnant in the course of treatment. In this paper we show some of the data gathered since then, with special attention to the low frequency of side effects and of toxicity to the mother and her baby when using the D.M.S. scheme.

A possible anaphylactic reaction to rifampicin.

H. K. Kar, R. K. Gautam and A. K. Sharma
Department of Skin, STD and Leprosy
Dr. N. M. L. Hospital, New Delhi, INDIA.

A 60 year old male with untreated tuberculoid leprosy was advised for multi-drug therapy. One hour after the intake of the 1st dose of Rifampicin (600 mg.) empty stomach, the patient developed breathlessness, urticarial lesions and features of peripheral circulatory failure. The patient was revived with O2 inhalation and drugs like adrenaline. Although the clinical diagnosis of anaphylactic reaction was made, the possibility of anaphylactoid reaction could not be ruled out.

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Spontaneous and Multidrug Therapy Induced Sister Chromatid Exchange in Patients with Tuberculoid and Lepromatous Leprosy.

P.K. Ghosh1, R. Madhavi Mohan Guntur2 and V. N. Sehgal3*1
**Deptt. of Anthropology, University of Delhi, India.
3 Loknayak Jai Prakash Narayan Hospital, Delhi, India.

Leprosy is a chronic infectious disease caused by Mycobacterium leprae. Estimates for the total number of leprosy patients in the world vary from 10 to 15 million, India, with an estimated four million leprosy patients, accounts for one third of the global incidence. One of the greatest advances in the field of leprosy treatment is the introduction of multidrug therapy. Combination drug therapy reduces the incidence of drug resistance, shortens the treatment period and prevents the emergence of drug resistant strains. However, the effect of multi-drug therapy on human chromosomes has not yet been investigated. In the present paper we report the spontaneous and multidrug therapy induced sister chromatid exchanges (SCE) in patients with tuberculoid and lepromatous leprosy. The spontaneous SCE frequency was investigated in 16 tuberculoid and 20 lepromatous leprosy patients. The frequency of SCE was found to be 7.56 ± 2.11 and 9.66 ± 2.93 in tuberculoid and lepromatous leprosy patients respectively. These values were significantly higher than the SCE value of 6.38 ± 1.31 observed in 41 age and sex matched healthy controls (p < 0.001). The SCE frequency in lepromatous leprosy patients receiving multidrug therapy, Combination drug regimens elevated the SCE frequency to 9.16 ± 2.67 in tuberculoid leprosy and 11.25 ± 3.43 in lepromatous leprosy. These values again were significantly higher than the corresponding spontaneous SCE levels of tuberculoid and lepromatous leprosy patients (p < 0.003 and 0.05 respectively). The significance of these findings are discussed in the light of differential cellular response and as a factor in cancer susceptibility of tuberculoid and lepromatous leprosy patients.

PO 472

Hypersensitivity to Rifampicin in a patient undergoing multidrug therapy for lepromatous leprosy.

José Luis de Oliveira Gomes, Maria del Pilar Riot and Dominic Kornsot
Centro de Saúde Washington Luis, São Gonçalo, Rio de Janeiro, Brazil.

The authors present the case of a patient with lepromatous leprosy undergoing multidrug therapy, who one day after the second scheduled dose presented disseminated purpuric skin lesions and necessitated immediate admission to the State Hospital of Ilumiatometro where she underwent intensive Cortico-therapy. The skin lesions were considered a result of the monthly dose of Rifampicin. Multidrug therapy has since been suspended and the patient is now on mono-therapy using dapsone.

PO 473

Dapsone poisoning.

P. Thirumalai Kola Suresh Chandra, A. Alagappa, & S. Sharmishtni*.
Dept. of Medicine, Madurai Medical College, Madurai 625 002, and Dept. of Geography, Madurai Kamaraj University, Madurai 625 046, India.

Cases of suicidal poisoning due to dapsone over a period of 12 years (1976 to 1987) were analysed with reference to clinical features and recovery. There were 22 cases (M:F = 14:8) age ranging from 10 to 35 years. The quantity of dapsone consumed varied from 1000 mgs. to 2000 mgs. Earliest features were vomiting and bluish discoloration. Clinical examination revealed cyanosis in all, restlessess in 7 and drowsiness in 5. One of them had cheiroathetosis and signs of trismus and pallor of the upper limbs. Among the 22, 3 were taking dapsone for epilepsy, and the rest were not suffering from leprosy but had access to dapsone available at home. Methemoglobinaemia was tested in 12 and was positive in 8 of them. Cyanosis started disappearing from 3rd or 5th
day and it was related to the quantity of dapsone consumed, both for intensity and clearance. Three (3/22) individuals who stopped consuming dapsone after 1/3 to 2/3 of the prescribed doses, brought about 18 hours after consuming the poison, and autopsy revealed petechial hemorrhages in the brain and cerebral edema. Their visceral organs were congested. From these observations, it is considered that whenever a patient is brought with cyanosis to an emergency room without any organ disease, look or ask for dapsone over ingestion until proved otherwise especially in areas where dapsone is issued on monthly basis to patients, since early recognition and simple management helps for complete recovery. (Sponsored by THSR, Madras).

A COMPUTERIZED REHABILITATION WORKSTATION

Charles A. Patout, Jr., M.D., David Giurintano, Daniel Riordan, M.D., Rehabilitation Branch, Carville, Louisiana, U.S.A.

Despite continuing efforts, long delays exist in the distribution of new information on rehabilitation in Hansen's Disease. To help correct this problem, a Computerized Rehabilitation Workstation is being developed which will draw from an archival library containing more than 10,000 research, anatomical and clinical slides. Computer Aided Instruction (CAI) programs are being developed which allow trainees to take interactive, comprehensive courses on the rehabilitation of the Hansen's disease patient. In addition, to more effectively utilize this broad spectrum of material, a Knowledge Based System (KBS) is also being developed. This system consists of the knowledge, experiences and decision making capabilities of experts. Contrasted with CAI, the main focus of KBS is to assist the medical professional in the diagnosis, evaluation and treatment of real patients. The KBS and CAI programs together will form the Computerized Rehabilitation Workstation. When completed, the workstation will be an inexpensive, portable personal computer that can be easily transported to Hansen's disease facilities around the world.

INVESTIGATION OF SIDE EFFECTS OF A MAXIMAL MULTIPLE DRUG THERAPY REGIMEN USED IN DUTCH LEPROSY PATIENTS

T.A. Eggelies, R. van Rene, D. Leiker
M.R. Stellengrebel Institute for Tropical Hygiene, Royal Tropical Institute, Amsterdam, The Netherlands.

Leprosy patients, who had already been under treatment, were given a maximal multiple drug regimen, consisting of daily 400 mg rifampicin and 100 mg dapsone for six months in case of tuberculoid leprosy patients (N=53) and daily 600 mg rifampicin, 100 mg dapsone and 100 mg clofazimine every two days for 12 months in lepromatous patients (N=58). The regimen included treatment at two monthly intervals for monitoring liver (SGOT, SGPT, LDH, CT) and kidney function tests (creatinine and uric acid).

HAEMATOXIC SIDE EFFECTS OF DAPSONE

T.A. Eggelies, R. van Rene, E.M. Huddeman, J. Ewida, R. Landheer, D. Leiker
M.R. Stellengrebel Institute for Tropical Hygiene, Royal Tropical Institute, Amsterdam, The Netherlands.

Methaemoglobinemia and haemolysis are side effects most often reported in connection with dapsone intake. In studies with volunteers, who were administered 50-300 mg maximum dapsone, methaemoglobin levels were directly correlated with peak plasma levels of dapsone and intake doses, showing an increase of 3-5% with each additional 100 mg dose. Maximum in methaemoglobin formation is found a later time than the peak in DDS plasma levels. Using an in vitro methaemoglobin formation assay, it could be shown that N-hydroxy DDS, the metabolite of DDS, responsible for the haematoxic effects, reaches its maximum plasma concentration, when also DDS levels are maximal. In vitro methaemoglobin formation with N-hydroxy DDS is dependant on the 0-60 min activity of the erythrocytes of the patient. Methaemoglobinemia due to intake of dapsone could be demonstrated by decrease in haptoglobin and haemoglobin plasma levels in volunteers who had been taken DDS or administered DDS depot injections. The decrease being dependant on maximal DDS plasma levels reached.

METHODOLOGIE NÉCESSAIRE A L’ETUDE DES NEVRITÉS HANSENIENNES

A. CARAYON
Institut de Léprologie Dakar - 1977-1981

1 - Déclenchement : L’étude de 250 dos. de névrites d’évolution récente (70 lésions) a montré que le déclenchement est indépendant de l’échelle de R. et J. et qu’il est provoqué par les réactions SLE et RR. 2/3 contextes de déclenchement étaient factuellement indiscutables, 1/3 réactions symptomatiques confirmées par la biologie et les biopsies tronculaires.

2 - Modifications histologiques et associées

Remarques pathologiques, différents dans les deux
reactions: macroscopic, microscopic (inversion of cellules inflammatoires, concentration bacillaire, microvascu- 
laire immunopathologic, renforcement de l’épithéne du 
fais extrapéripalier et des prépirales).

- Déflagrations pathophysiologiques:
  - de l’hémodynamique (glide circulatoire, hyperfiltration
  - gloméreuse, hyperpression tronculaire de 20 à 25 mm, angle
  - graphique,
  - effet de compression passive par les canaux ostéoige-
  - menteux sur le nerf hypertrophié (mesurations, neurogra-
  - phie, hyperpression canalaire de 30 à 40 mm).
  - déflagrance de la myéline
  - Apport de l’expérimentation animale
  - Pour les lésions nerveuses (neurographic).

• Apport de l’expérimentation animale
  - Potentiel d’inhibition nerveuse (neurographic).
  - Conduction velocity of the ulna nerve across the
  - elbow was the most striking abnormality (495
  - other neuropathies.

EMG abnormalities, particularly slow conduction 
velocity in the ulnar nerve across the elbow was the most striking abnormality (495

A frequency domain analysis of myoelectric signals 
in Hemananu.

Carlos R. DeFaria and Ilma M. Silva

RECORDING DISABILITIES ON A NATIONAL INDIVIDUAL 
PATIENT FORM

Jean M. Ntoum, Maryko Becks-Blumkin,
Richard de Stedenhoff

This paper stresses the importance of having a simple but useful disability section incorporated in the 
national Individual Patient Form used in the field. Supportive data is given, illustrating the advantages 
and disadvantages of such sections.

The paper outlines:
1. Uses to which a good disability record can be put:
   - in identifying action needed to minimise disability,
   - in monitoring changes in disability, and
   - in evaluating the effectiveness of action taken to minimise disability,
   - as an indicator useful in monitoring early case-finding.
2. A suggested disability record format ... with examples shown of this as already incorporated into 
   various national Individual Patients Forms.
3. The usefulness of each section of the record. Comments are made as to which uses can and cannot 
   be met through WHO disability grading.
4. How the Information from the record can usefully be summarised for planning and evaluation purposes.
   Charts are shown to illustrate findings elicited using this disability record in Ethiopia and Zambia.
   - Baseline disability information obtained from many records in summarised
   - Changes in disability over a 6 month period in pauci-bacillary patients are summarised.
   - Changes in sensation and strength, before and after a Pridinesaline course, are summarised.

TUBERCULOID HANSENS ON HAIRY SCALP

(A CASE REPORT)

Ashok Ghorda, Cherukut Ramanan,
Pratap Rai Manglani

Department of Dermatology

Main Hospital and Research Centre

Bhilai Steel Plant, Bilhali ( India )- 490009

A patient of tuberculoid Hansen's with a lesion on the hairy, occipital area of scalp is reported.
The patient had a well defined, circular, raised anaesthetic plaque with sparse hairs on the occiput, well within the hair line. The diagnosis was confirmed by histopathology. To the best of our knowledge, this is the first case report in the world literature of involvement of hairy scalp by a tuberculoid lesion.

Histoid leprosy: A prospective diagnostic study

Virendra N. Sehgal, Govind Srivastava

Histoid leprosy is a fascinating expression of multibacillary leprosy, the incidence of which was 3.6%. It was predominantly seen in males of the younger age group, who were on inadequate, and irregular dosage of diaminodiphenyl sulfoxine. Papules, cutaneous and/or subcutaneous nodules and plaques appearing over an apparently normal skin were its exquisite prospective clinical features. It was invariably supported by enormous, uniformly solid staining discrete bacilli from the skin in contrast to their virtual absence from the surrounding normal appearing skin. Encapsulated tufted mass formed primarily by spindle shaped histiocytes, displayed in interstices, cris-cross or whorled fashion in haematoxylin-eosin stained sections, were supplementary. The display of acid-fast bacilli was, however, similar to skin-slit smears.

PO 485

PALATE AND SCROTAL LESIONS IN LEPROSY

A.C. Parikh, D.A. Parikh and K. Ganapati

Indian Leprosy Project, Bombay, India

Involvement of genitals in leprosy has not been well documented in the literature. Lesions on the external genitails may be encountered in leprosy of all types in the entire Ridley-Jopling spectrum. It is however not known whether lesion of indeterminate leprosy, representing the earliest clinical manifestation of the disease can occur in these organs.

We present clinical photographs of leprosy lesions ranging from TB to LL types involving the penis and the scrotum in six patients.

We feel that no clinical assessment in leprosy is complete till thorough examination including external genitalia of patients is carried out.

Unusual presentation of a Verrucous Lenton in a patient with Borderline-Tuberculoid Leprosy

Binit Viera, P. De Paula, D. Marques, A. E., Avelar, J.C. and Andrade, V.G.

Ourupati State Hospital - Rio de Janeiro - Brazil

An unusual case observed in the Ourupati State Hospital was a large Verrucous Lenton on the right supercillary region of a woman with MT Leprosy and one large erithematous plaque on the same hemisphere. In this paper the clinical and histopathological findings are presented and discussed.

PO 487

Neural Leprosy - With Unusual Presentation

Tebebe Yenane Berhan

All Africa Leprosy & Rehabilitation Training Centre (ALERT) Addis Ababa, Ethiopia.

Neural leprosy presenting as a single Radio Cutaneous palpable nerve not enlarged and not tender with a high bacterial count is a rare occurrence. Such a case has been seen at All Africa Leprosy & Rehabilitation Training Centre (ALERT) 030982. The nerve biopsy showed some dense lymphocytic infiltrations between the nerve fibers. Many schwann cells contain small globi of fragmented/granulated bacilli. Skin smears from six standard sites were negative. The patient was treated with dapsone monotherapy with satisfactory response. In the literature neural leprosy does not occur in Africa, but there have been 83 Neural Leprosy cases which have been proven by nerve biopsy in the evaluation of new leprosy cases with unusual neural presentation. Without such information, these cases would have not been confirmed.

PO 488

TONGUE CHANGES IN LEPROSY


Madurai Medical College, Madurai 629 020, India

An attempt was made to study the tongue changes among leprosy patients (Tuberculoid - 175, Lepromatous - 85 and lepra reaction 40); M:F = 236 : 64; age 10 to 50, Mean age 28.4 years) attending leprosy clinic of Government Rajaji Hospital, Madurai. In all these cases other associated systemic illnesses were ruled out. Similar number of healthy individuals (age and sex matched) living in the same environment or their family members were kept as control. Tongue was examined in the day light for size, shape, color, surface, papillae, ulceration and nodules. The neurological evaluation of tongue was done for each case. Macroglossia was seen in 4, coating in 28 (central in 7, Marginal in 12 and both in 9), prominence of papillae in 17 (Papillae Form in 7, Fungi Form and Fungi Form in 12 and circumvallate in 6) and nodule is only one case (lepromatous type without reaction - in the middle of tongue). The coating of the tongue and prominence of papillae observed among leprosy cases were significant from control, but were independent of the type of disease or with reaction. There was no neurological involvement of the tongue in the leprosy subjects studied. However, if any nodule or ulcer is seen in the tongue, it has to be investigated accordingly to find out the appropriate cause. (Sponsored by SCMR, Student Fellowship).

PO 489

ESTIMATION OF HIGH DENSITY LIPOPROTEIN INDICATES (HDL-C) IN THE DIAGNOSIS OF LEPROTUS LEPROSY.

Kumar, Niranj; Saraswat, P.K.; Shanker, Ajai; Srivastava,S; Singhal,A.

High density lipoprotein (HDL) and its subfractions, HDL-C1 and HDL-C2 are the most important, protective lipoproteins which play a significant role in the atherogenic process. The HDL-C levels were significantly lower in Leprotus leprosy patients (Tuberculoid - 175, Lepromatous - 85 and lepra reaction 40); M:F = 236 : 64; age 10 to 50, Mean age 28.4 years) attending leprosy clinic of Government Rajaji Hospital, Madurai. In all these cases other associated systemic illnesses were ruled out. Similar number of healthy individuals (age and sex matched) living in the same environment or their family members were kept as control. Tongue was examined in the day light for size, shape, color, surface, papillae, ulceration and nodules. The neurological evaluation of tongue was done for each case. Macroglossia was seen in 4, coating in 28 (central in 7, Marginal in 12 and both in 9), prominence of papillae in 17 (Papillae Form in 7, Fungi Form and Fungi Form in 12 and circumvallate in 6) and nodule is only one case (lepromatous type without reaction - in the middle of tongue). The coating of the tongue and prominence of papillae observed among leprosy cases were significant from control, but were independent of the type of disease or with reaction. There was no neurological involvement of the tongue in the leprosy subjects studied. However, if any nodule or ulcer is seen in the tongue, it has to be investigated accordingly to find out the appropriate cause. (Sponsored by SCMR, Student Fellowship).
mixed infections either

The prevalence rate of both sexes and of the soil-transmitted helminths in leprosy patients in leprosy patients aged below 60 years, taking plasma HEC levels as 28-71 mg/dL in men and 347±71 mg/dL in women, as an range of normal values. The paper discusses the results of HEC-C estimations as applied to 96 (50 under treatment and 46 untreated) leprosy patients and 84 randomly selected matched control patients suffering from other skin diseases attending skin out-patients department. The study revealed that HEC-C levels in lepromatous leprosy group were raised and significantly different when compared with control group. The sensitivity of the test was very high, 97.7% (94/96), but specificity was low, 80.9% (68/84). False positive and false negative results were 19.0% (16/84) and 2.0% (2/96), respectively. It is opined that a negative test will be mainly useful in excluding diagnosis of lepromatous leprosy. The procedure is less painful and without facial scar.

Ascaris lumbricoides, and 2.1% Strongyloides stercoralis. Midified Harada-Mori method was used in the determination of species of hookworm and Strongyloides stercoralis. Ascaris lumbricoides, and 2.1% Strongyloides stercoralis. Midified Harada-Mori method was used in the determination of species of hookworm and Strongyloides stercoralis. As a result, the results were: 9 gastric cancers, 7 colon cancers, 5 lung cancers, 3 hepatomas, 3 uterine cancers, 2 cancers of the gall bladder, 2 cancers of the urinary bladder, 2 breast cancers, 1 prostate cancer. They were diagnosed by echography, ultrasonography, CT scan, biopsy or Palpation, gastrofibroscopy, cystoscopy, uroscopy, and others. In excluding diagnosis of lepromatous leprosy. The study revealed that LDL-C levels in lepromatous leprosy in patients aged below 60 years, compared with 97.5% in leprosy, compared with 97.5%, less than 20% intermediate and, less than 14-30th.

In Japan it had been said that cancers were very rare among the leprosy patients. However, the difference in hookworm infections, and only 19.2% single infections, compared with 97.1% Trichuris trichiura, 62.1% hookworm, 53.9% Ascaris lumbricoides, and 2.1% Strongyloides stercoralis. In the whole population, 98.8% in leprosy and 96.8% in contacts. Of the positive results were: 9 gastric cancers, 7 colon cancers, 5 lung cancers, 3 hepatomas, 3 uterine cancers, 2 cancers of the gall bladder, 2 cancers of the urinary bladder, 2 breast cancers, 1 prostate cancer. They were diagnosed by echography, ultrasonography, CT scan, biopsy or Palpation, gastrofibroscopy, cystoscopy, uroscopy, and others. In excluding diagnosis of lepromatous leprosy. The study revealed that LDL-C levels in lepromatous leprosy in patients aged below 60 years, compared with 97.5% in leprosy, compared with 97.5%, less than 20% intermediate and, less than 14-30th.

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CLIP ACTION AND LEPROSY

Dr. M.K. Soni
Department of E.N.T., S.P. Medical College,
Bikaner, India.

Involvement of nasal mucosa or tenderness of nerve affection in leprosy is
likely to impair the sense of smell. Anosmia, if present in leprosy, is responsible for
some additional misery for the patient. The sense of smell was assessed in 50 leprosy
patients. The method used and results are presented. Twenty-six patients (about 26.4%) showed some
or more degree of anosmia and this was found to be related with severity of local (nasal)
lesions and also with systemic manifestations. The results were compared with available
literature, in which only 2 cases of anosmia were reported. No cases of anosmia and also etiopathogenesis of anosmia
are discussed in light of available literature.

Middle ear function in Hansen's (Tympanometric study)

Dr. M.K. Soni
Department of E.N.T., S.P. Medical College,
Bikaner, India.

Involvement of nasal fossae In leprosy may impair the function of eustachian tube resulting in disturbed middle ear function. Thirty patients of lepromatous leprosy with variable stapes were subjected for tympanometry to assess the middle ear sound conducting system. Negative middle ear pressure was found in 16 patients (50%) with unilateral and 9 with bilateral affection. Various patterns of tympanograms were recorded. Common being showing conductive deafness with intact tympanic membrane. This function of middle ear was found to be affected in 60% of lepromatous leprosy patients.

THE DENTAL AND MALOFOCIAL CONDITION OF 1155 LEPROSY PATIENTS IN GUANGDONG

Province

Tu Yilu and Diu Weiping, China Leprosy Centre, Guangxi, China.

Abstract: The oral and maxillofacial damage caused either directly or indirectly to segregation and neglect by the dental profession. Those patients with multibacillary type were found to have more dental caries teeth than the paucibacillary type. The mean caries teeth per person of multibacillary type was 1.66 and the mean tooth loss per person was 176.1. The tooth losing rate was 69.5% and the mean tooth loss per person was 5.23. Periodontal disease was found in 607 cases. The frequency of E.L.I.S.A. test results in respect to the presence of Mycobacterium leprae, M. tuberculosis, M. kansasii, M. bovis and M. marinum were evaluated in a selected population including individuals with leprosy, patients of other Mycobacterium infections, leprosy contacts and healthy individuals. The sera from about 500 individuals were examined using E.L.I.S.A.

The need for methods for early diagnosis and for prognostic evaluation, is prominent in all mycobacterial infections.

The usefulness of phenol glycolipids from M. leprae, M. tuberculosis, M. kansasii, M. bovis and M. marinum were evaluated in a selected population including individuals with leprosy, patients of other Mycobacterium infections, leprosy contacts and healthy individuals. The sera from about 500 individuals were examined using E.L.I.S.A.

The frequency of E.L.I.S.A. test results in respect to each population group was statistically analyzed, and the possible usefulness of these phenol glycolipids antigens in clinical medicine and epidemiology will be presented.

Study of anti-Mycobacterium leprae antibodies in leprosy patients and their contacts.

Elba González-Abreu, Roberto Olivares, Nacho Núria, Milagros Pérez and Angel B. González
was found but whose lepromin reaction was 0 mm PO 50i and the skin smear showed a DI.

A relation between lepromin reactions and absorbance values which were inversely correlated to the clinically examined contents above the established absorbance cut-off value suggested that the box-assay had not ceased yet. Consequently, patients were grouped according to leprosy type and length of treatment. For the multidrug regimen, the test can be useful for monitoring the efficacy of treatment in multibacillary leprosy patients. For the multidrug regimen, the test can be useful for monitoring the type and length of treatment. For the multidrug regimen, the test can be useful for monitoring the type and length of treatment.

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ELISA inhibition assay. The following observations were obtained:

1. In general, trisaccharides have higher avidity to the antibody than disaccharides when used the same solubility of sugar.
2. Some methylation groups on the sugar molecule are critical in the antigen-antibody reaction.
3. Some combinations of sugar and linker arm influence the specificity or sensitivity of the antigen.
4. Among the sugar-protein conjugates tested so far, trisaccharides with the natural molecular structure of phenolic glycolipid-I was the best antigen for practical use.

PO 505A
Serological activity to a 36 kD antigen of M.leprae among household contacts of lepromatous patients.

P.R. Klatser*, M.Y.L.de Wit*, R.V. Cellona‡, T. Fajardo‡, R.M. Abalos‡ and M.G. Madarang‡.

*NH. Swellegrebel Laboratory of Tropical Hygiene, Royal Tropical Institute, Amsterdam, The Netherlands.
‡Leonard Wood Memorial Center for Leprosy Research, Cebu City, The Philippines.

An ELISA-inhibition test measuring antibody reactivity to a species-specific epitope on a 36 kD antigen of M.leprae has been evaluated for its use in the detection of preclinical leprosy. Preliminary data are presented from a continuing prospective study in the Philippines on household contacts of newly diagnosed lepromatous patients, which have lived in an area with the index case for at least three years prior to their diagnosis and the 36 kD. Serum samples from 310 contacts (8.7%) were consistently positive when following the ELISA-inhibition reactivity in a prospective fashion. Of the 27 seropositive contacts, 4 have developed disease. These contacts showed antibody reactivity up to 12 months prior to clinical onset. Of the 283 seronegative contacts, 2 developed disease. These findings indicate a possible increased risk of developing disease in seropositive individuals. These results will be discussed in relation to the findings in patients and controls.

PO 506B
EARLY DETECTION OF LEPROSY WITH A SEMI-SYNTHETIC DISACCHARIDE (M-BSA) conjugate.


University of Hawaii, Honolulu, Hawaii, USA and Leonard Wood Memorial Center for Leprosy Research, Cebu, Philippines.

We describe our preliminary findings from study still in progress on: 1) the prevalence of antibody to the ND-O-BSA antigen, in contacts of multibacillary (MB) patients and 2) the development of disease in relation to seroconversion. The ND-O-BSA antigen presents a construct of terminal and penultimate sugars of the PG-I molecule of M.leprae. Contacts are household members of MB patients. Controls and contacts were free of leprosy by skin examination at time of admission to the study. The reactivity of the controls was 1.7% (7/401) compared to 8.5% (35/410) of the contacts. Six contacts developed leprosy during a 4 to 36 month period. Chi-square analysis on the data is significant (p<0.01) when comparing the proportion of test positives out of those who have developed disease (4/6) to the rate of test positives who did not develop disease at the time of blood draw (3/404). The 4 positives developed MB disease and the 2 who tested negative developed paucibacillary disease. The test, with the data accumulated thus far, is able to indicate those contacts who have a high risk of eventually developing MB disease. It should be noted that the numbers in the disease category naturally should be small in comparison to the population of contacts of tested.
of antigen required is only 5 µl in 1:1000 dilution (0.1 µg/5µl). Thus the slide ELISA appears rapid, economical and sensitive. Even though qualitative it can be adapted to field and results expressed as titres. The test can be used for screening large number of sera. If necessary the positive results can be confirmed by quantitative assay using microtitre plate method in a central laboratory.

PO 509
A RAPID AGGLUTINATION TEST FOR THE DETECTION OF LEPROSY AND TUBERCULOSIS
S.C. Chau, G.T. Talwar, B.Mukherjee and H.V. Bartha
National Institute of Immunology
New Delhi-110 067, INDIA

Leprosy and tuberculosis are major mycobacterial infections afflicting the developing countries. We describe here a test which puts into evidence both, the infectious form of multibacillary leprosy and pulmonary tuberculosis. The test is an antibody detection assay. Polystyrene or carboxylated latex bead particles are coated with sonicate, predominantly in bacillary active patients. A drop of test serum is added to a drop of sensitized beads, mixed thoroughly and gently rocked. Positive sera cause agglutination within two minutes. This test, sera from, 110 leprosy, 82 active tuberculosis, and 70 apparently healthy control were screened. The results demonstrated that the test detects 75% of patients with infectious form of multibacillary leprosy and 83.6% of active pulmonary tuberculosis patients. False positivity was 2%. The reproducibility of the test in several hands was evaluated using coded samples. The test is rapid, simple, and easy to perform and can be a useful aid to clinical diagnosis.

PO 510
A Preliminary Study on Comparison of Serological Activity in Sera from Patients with Leprosy, Contacts of Leprosy Patients and Normal Controls
Tulip Tan, Bory Lai Peng and Kamarudin b All
Middle Road Hospital, Singapore

The presence of phenolic glycolipid (PG) in M. leprae has been described in recent literature. Antibodies directed against the lipid were found in serum from leprosy patients. Using the phenolic glycolipid antigen, ELISA method has been developed for serodiagnostic test of leprosy infection. In a preliminary study for comparison of serological activity using ELISA method, a total of 209 sera were studied. They were collected from leprosy patients (37 cases), family contacts of leprosy patients (29 cases), healthy workers in contact with leprosy patients (21 cases) and normal controls (122 cases). 37 leprosy patients (40.54%) had positive antibody level as compared to 4.02% in normal controls. The difference was statistically significant (x² = 22.9, p < 0.001). Comparisons made against the family contacts (40.15% compared with 4.43%) and health workers (40.54% compared with 4.51%) indicated significant results, (x² = 0.005 and p = 0.026 respectively). 75% of patients with lepromatous (LL) leprosy had positive antibody compared with 31.25% tuberculoid (TT) leprosy patients. The difference was not statistically significant as the number of sera tested was small. LL leprosy patients also tended to have higher antibody levels than TT leprosy patients.

PO 511
SEROLOGICAL ANALYSIS OF LEPROSY PATIENTS UNDER MULTIPLE DRUG THERAPY (MDT) IN VIETNAM. A PRELIMINARY REPORT
Nguyen Thai Hiep, Dang Duc Trach, Nguyen Kim Thanh, Nguyen Duyen, Tran Xuan Huy, Hoang Thuong Long(1); Nguyen Duc Thang & Le Kinh Due(2); P.R. Klaver(3) & J.T. Hendriks(4).

Leprosy and tuberculosis are major mycobacterial infections afflicting the developing countries. We describe here a test which puts into evidence both, the infectious form of multibacillary leprosy and pulmonary tuberculosis. The test is an antibody detection assay. Polystyrene or carboxylated latex bead particles are coated with sonicate, predominantly in bacillary active patients. A drop of test serum is added to a drop of sensitized beads, mixed thoroughly and gently rocked. Positive sera cause agglutination within two minutes. This test, sera from, 110 leprosy, 82 active tuberculosis, and 70 apparently healthy control were screened. The results demonstrated that the test detects 75% of patients with infectious form of multibacillary leprosy and 83.6% of active pulmonary tuberculosis patients. False positivity was 2%. The reproducibility of the test in several hands was evaluated using coded samples. The test is rapid, simple, and easy to perform and can be a useful aid to clinical diagnosis.

PO 512
SEROLOGY OF LEPROSY: THREE DIFFERENT TECHNIQUES.
B.J. Franco, L. Cecero, L. Llopis, A. Balbi.
Hospital Nacional B. Somer, Bs.As., Argentina.

An ELISA assay for M. leprae where two antigen was absorbed on a membrane filter has been developed in our laboratory. M. leprae was isolated from subcutaneous lepromas of untreated patients using the procedure described by Philip Draper in 1979. A suspension of 2 x 10^8 bacteria per ml in 0.01 M ammonium carbonate- carbonate buffer pH 8.2 was used as antigen. Five ul of this suspension were spotted in different positions of the filter and the block was washed with phosphate buffered saline pH 7.2. 0.14 Tween 20. Horseradish peroxidase labelled antihuman rabbit IgG was used in the secondary reaction and hydrogen peroxide and 3,3',5,5'-diaminobenzidine Tetra HCl in the color reaction. Immunofluorescence tests were performed on glass slides using the antigen suspension described for ELISA tests. ELISA-ABS on plates was performed using a previously described by us (B. J. Franco y col., Temas de Leprologia N° 49, 1987) and FIA-ABS (fluorescent immunoassay) described by Abe et al (Int.J.Lepr. 48:109-119, 1980). Serum of lepromatous patients and from healthy people from non-endemic areas were used as positive and negative controls. All sera were absorbed with M. vaccae and BCG. We have tested serum from several groups, household contacts, blood relatives, hospital workers, patients with pulmonary tuberculosis, healthy people with BCG and leprosy patients' sera which have been isolated from their parents. Results show that the sensitivity and specificity of the proposed assay is satisfactory for clinical investigation of serology of M. leprae.
The sera were also screened for the presence of antibodies reactive to M. leprae antigens present in plagues of the lambda Hgt 11 recombinant clones Y3164 (12Kd), Y3165 (20Kd), Y3160 (36Kd) and Y3176 (65Kd). Drop of recombinant plaques were placed in lanes of E. coli T100, the plaques were grown and the antigens transferred to nitrocellulose for immunoblotting. Early results showed the presence of 36Kd and 36Kd in a few of the sera studied. No reactivity was observed with the other proteins.

These studies are being carried out for further confirmation, using sera from all stages of leprosy infection for both treated and untreated lepromin positive and lepromin negative contacts and normal healthy individuals.

Summary. The authors propose: 1) To study the serology by immunoenzymatic assay (ELISA) on leprosy patients and their household/non household contacts. 2) To appraise the subclinical infection and high risk group incidence. Materials and Methods: There are two groups under analysis. The first one composed by lepromatous and dimorphous patients (active and non active) and tuberculoid ones. The second group is composed by leprosy contact healthy subjects, including the following subgroups: household/non household contacts of lepromatous, dimorphous and tuberculoid patients (untreated or with recent treatment, less than five years) and recent household/non household contacts of inactive leprosy patients or old cases (more than five years treatment). Within both groups sera were studied through the immunoenzymatic procedure with previous absorption by Mycobacterium BCG and variola and there are also developed clinic, bacterioscopy, histopathological examinations and Farnandez-Mitsuda reaction. Results: Positive titers are observed in all active leprosy patients (lepromatous and dimorphous cases). In the first subgroup is evidenced a high subclinical infection incidence among normal subjects householding with IL and HL leprosy patients (2/3) of household subjects. It is found the high risk group composed by those subjects with subclinical infection, negative Mitsuda reaction, householding with active leprosy patients. Conclusions: It is emphasized the importance of serology by immunoenzymatic assay, as early detection methodology of subclinical infection and high risk groups. Groups to which should be out-of-step chemoprophylaxis procedures, with clinical and serological subsequent follow-up, in order to appraise their evolution.

Multimedia Educational Campaign about Hansen's Disease. Silveira, Maria L. H.; Moreira, Maria R. B.; Pereira, Gerson F. M.; Alves, José J. P. National Division for Sanitary Dermatology - MS.

The stigma associated with Hansen's disease is widely disseminated throughout Brazil. The prejudice is felt not only in society at large but also among health professionals and it has become an obstacle in the path of effective leprosy control actions.

The official change of the name leprosy to Hansen's disease was intended to occur together with a far-reaching mass media campaign. That was not the case, however. To the contrary, both society and the government circles were inclined to underplay the problem.

The results observed after the first six months of the multimedia campaign - TV, radio, newspapers, as well as films posters and leaflets - point to the destructibility of keeping up this campaign.
A 6-page booklet with 39 colour photos has been prepared, to meet the requests of all those who, though not engaged in health activities, are willing to assist in the detection of leprosy cases. The reception of these people of good will is very valuable, not only because they permit to expand leprosy case finding, but because through friendly and informal relations they often have a better chance to persuade suspected leprosy sufferers to let themselves be examined and treated by doctors.

The text has been arranged according to the suggestions received from the target users themselves. Accordingly it deals with the causes of leprosy, it shows the effectiveness of present day treatment; it gives facts which may counteract wrong popular beliefs; it gives guidance in dealing with individuals who may be affected by skin diseases other than leprosy. Copies, in English, are available writing to:

Dr. J. M. Gemieux (Collège Raoul Poller, Martinique).
M. Constant-Desportes, S. Polo, 337, 010 S. Polo (In)
Italy

PO 519

INFECTION OF STUDENTS IN LEPROSY HEALTH EDUCATION PROGRAMME - AN EXPERIMENT.
S. J. Rajk, R. G. Swamin, P. M. Godbole.
acworth Leprosy Hospital Society for Rehabilitation and Education in Leprosy, Madrasi Bombay-400 031, India.

The students' participation at college and high school level can be obtained for leprosy Health Education Programme if proper motivation is done and involving non-leprosy agencies such as student community will help to overcome the stigma of leprosy in Society.

The details about the experiment of last four years of "Involvement of college students volunteer" and "Mitra" ("Friends" action oriented programme for high school students) has been described. The participation of 25 active members in college students' group gives approximately 200 Health education talks on leprosy per year which costs at 30% of routine health programmes. In "Mitra" activity has 6000 students membership and participation of 116 high schools in Maharashtra State. The programme work out as cheaper and effective and acts as an auxiliary force to augment routine services in Leprosy. Both these experiences have potential of multiplication in different regions.

PO 520

INCREASING PUBLIC AWARENESS OF LEPROSY THROUGH TOURISM.
Richard Marks
Leprosy Patient; Owner, Damien Tours, P.O. Box 11,
Kalaupapa, Hana, HI 96742.

Founded on the principles that people fear what they don't understand and cannot understand something unless they see it, Damien Tours has been in operation at the Kalaupapa Settlement for 22 years. Approximately 5,000 tourists a year travel to Kalaupapa and on this guided tour. Many other visitors come as guests of patients.

The tour is patient owned and operated and is designed to show how far medical knowledge and treatment have come. It tells the story of Father Damien and Mother Marianne but at the same time shows that nowadays the major wrackage from the disease comes from misunderstanding rather than the disease itself. Recognizing that for too many years leprosy has been covered up, the tour operates on the premise that unless the disease get in the open and talk about it, you won't do anyone any good.

Not only has visitation to Kalaupapa increased public awareness, it has had an effect on the public and community itself. Seeing that they are accepted by tourists simply as people with problems, the patients themselves have become more at ease with strangers and now travel freely throughout the United States and the world.

PO 521

AN URBAN RURAL CONTRAST STUDY ON COMIC STRIPS, A NOVEL MEDIUM FOR LEPROSY HEALTH EDUCATION.
C. G. Cheriyal, Health Education Materials Department, German Leprosy Relief Association,
4, C.Japathi Street, Shenoy Nagar, Madras - 90.

This study is the first of this kind conducted in order to assess the impact of comics as a medium for health education on the knowledge and attitude of people about leprosy. A questionnaire was administered at random on 2000 literate people from 3 urban (1200) and 2 rural (800) areas in South India for this study.

On analysis of the data collected it was found that 98.4% in the urban and 91.2% in the rural areas said that they believed leprosy is curable. Interestingly enough 97.6% and 89.3% respectively in the urban and rural areas were able to reproduce the signs and symptoms of leprosy. With regard to attitudes 80.8% in the urban and 76.2% in the rural areas had said that leprosy patients should not be driven out of homes, instead they should be cared.

It was also found that comic strips were welcomed by an overwhelming majority of the respondents in urban (95%) and in rural (78%) areas as a medium for health education in leprosy.

It is obvious that they made a definite impact on enhancing the knowledge of the respondents and in helping them change their attitudes and beliefs about leprosy. It was also found that the comics were very well received by all, especially the younger generation.

PO 522

EDUCATION SANITAIRE DANS LA LUTTE CONTRE LA LEPRE EN MARTINIQUE.

En Martinique, la lutte contre la lèpre nécessite à plus de 50 ans après l'époque théâtre Néerlandais, l'organisation actuelle est basée sur :

- un dépistage actif et systématique
- une information sanitaire très passive
- une polyvalence théâtrale

Les aires d'information de la population sont essentiellement des supports audiovisuels (i-répasse, film, dépliant, livrets, affiches et des émissions radio-télévisées).

La Journée Nationale de lutte contre la lèpre est une occasion où la population est totalement associée (ressources, gala d'artistes, expositions...). Les thèmes de ces dernières années ont été :

1965 : la lèpre dans notre épine
1966 : la lèpre dans le cerveau
1967 : la lèpre dans le nommé
1968 : la lèpre dans la famille
1969 : la lèpre dans la gamme de

Une expérimentation en 1965 a permis de situer le niveau des connaissances populaires sur la maladie. Le rapport des personnes interrogées concernant l'incidence de la lèpre, citant l'aggravation d'une tâche comme symptôme initial, attribuait la maladie à un morceau de vélo et en était une grande pour le lèpre. Tous ces résultats sont mis à profit pour une meilleure information de la population.
The knowledge and the attitude of leprosy in junior high school teacher in Taiwan

Pan-Fong Tsai and Pesus Chou

Taipei, Taiwan

The knowledge and the attitude of leprosy were studied among 7257 junior high school teachers in Taiwan during July 21 to August 20, 1986. The knowledge of leprosy was categorized into five items: (1) etiology, (2) clinical sign, (3) cause of disability and deformity, (4) curability, and (5) transmission. Excluding the transmission item, the correct answer rates of the other four items of knowledge were above 50%. The clinical sign was the lowest (52.1%). About half of the teachers thought that leprosy is easily transmitted or had no idea about the transmission, hence their attitude toward leprosy was negative. The attitude of leprosy was categorized into three items: (1) fear, (2) shame, and (3) refusal. Except for the refusal item, the attitude of the other two items were toward positive.

There was a positive relationship between the knowledge and the attitude. Age was inversely correlated with the total score of both knowledge and the attitude. Educational level, the teacher’s major course and teaching course were not significant factors for the knowledge and the attitude of leprosy. The attitude of “shame” was influenced by the mass media and the caring experience.

A three tier communication model for community participation in leprosy control

H. M. Saleem, T. Jayara Devadas and R. S. Mani

Indian Leprosy Foundation, Shenyangan, Madras 600 030, India.

The model adopted by Indian Leprosy Foundation aims at Tier I, transmitting scientific information on leprosy to the general public. Tier II, using community institutions to achieve this purpose and 03. Providing opportunity for large scale participation of youth in leprosy awareness campaign.

Methodology: Educational institutions are selected as settings for implementing this model. Full time Field Officers are recruited and allotted a geographical area of operation and an area to be covered. These Field Officers are trained and oriented them for community communication. Each student is given a maximum target of 60 persons from the neighborhood to be contacted and conveyed facts about leprosy within a time schedule.

Tools: Students are given a fact sheet format to be returned to their schools after recording details of contacts. Certificates and mementos to students and institutions are given in appreciation of their participation. This model ensures communication effective through peoples participation.

The Kalaupapa Settlement as part of the United States National Park Service

Henry C. Law


The U.S. National Park Service is entrusted with the preservation of such natural wonders as the Grand Canyon, Yellowstone and Yosemite National Parks. However, it is also responsible for areas that are deemed to be of great historical value, such as Independence Hall, the Statue of Liberty, Ellis Island, Alcatraz Prison and the White House. Due to its extremely educational and inspirational history, Kalaupapa was declared a National Historical Park in 1980 and thus became a part of the National Park System. While ensuring that the history of Kalaupapa will not be forgotten, this action also ensures that the remaining patients may live out their lives in the place they have come to regard as home.

Although the Park is filled with significant natural and archeological resources, the primary resource is the patients and their history. It is their story that makes Kalaupapa National Historical Park unique. Dedicated to the education of present and future generations with regard to the realities of leprosy, the Park stands as a monument to the patients’ ability to endure and overcome, both physically and spiritually, not only disease but man’s inhumanity to man.
In an endeavor to use the services of this personnel training methodology had been adopted which dealt exhaustively with the development of an awareness about the problem of leprosy control, as well as proper consideration of the above mentioned attitudes of the personnel in question.

In connection with above, the following topic will be discussed:

- "A methodology for problem management" and the application thereof in the training of nurses, physicians, social workers, and educators;
- The adaptation of this methodology to the training of secondary and elementary school level personnel; and
- Instructional material (videotape recordings, slides, tape recordings, and texts), to be used in medical schools.

THE PATIENT AS LEARNER. By Jacposte-Bardet, M.P.

The author spent nine years in Paramedical training, Control Program planning and administration. She observed that patients were often expected to absorb the same load of information and adopt the same new habits and attitudes irrespective of the varying manifestation of their disease and their differing circumstances.

In 1979 the author formulated a GUIDE TO HEALTH EDUCATION NEEDS OF PATIENTS, identifying what the patient needed to learn after taking account of the type of disease, likelihood of complications arising, presence of deformity or disability etc.

This guide is submitted in its 'pre-multi-drug-regime' form for information, discussion and adoption should participants find it useful.

It is recognized that this guide deals only with formulation of the content of the educational message, but it tries to emphasize some of the tasks that must be undertaken by the PATIENT AS LEARNER.

In the Author's experience many health workers who deal constantly with patients often over-simplify the dull repetitive job of giving health education. As long as health workers regard 'a patient as a patient' their efforts at education will tend to be inadequate and inappropriate.

Perhaps their job would be brighter if they thought of each patient as a learner with specific but varying learning needs.

The usefulness and effectiveness of this guide is to be studied by the Author in 1989 as part of a Ph.D. thesis on Health Education in Leprosy Control in India.

HANSU'S DISABLING DISEASES ENLIGHTENMENT CAMPAIGN IN NIGERIA. By Johnson M. P., Etspert.

This paper is a review of the methods used and the contributions facing a new Health Education campaign started in Nigeria. The aims of the campaign are among other things, to educate the general public on the facts on leprosy in order to remove the age-old social stigma which is still very strong in this environment, to foster early case-finding, in public health to prepare health workers and the public for the integration of Leprosy into the General Health Service.

This campaign is the very first time in Nigeria that a clear-cut publicity or prominence of any kind is given to Leprosy. The basic starting capital was provided by Rotary International.

Being a relatively new aspect of leprosy control activity, the project is beset with constraints of equipment and therefore scale.

The major goal of the presentation therefore is to bring this project to the notice of colleagues in the field of Leprosy, with the hope that on a team we shall together find solutions to the numerous problems that hinder the project. This also hoped that they may make suggestions on how to improve the campaign.

Finally, sharing the experience may also stimulate leprosy workers in other areas especially those who have as yet not started any public education program.
LEPROSY ENDEMICITY IN YALISOMBO, A PREVIOUS LEPROSY COLONY IN ZAIRE.

Guy Groenen, Stefaan R. Pattyn, Peter Gnys, Jo Colston.

SARILE-VILLAGE IN ZAIRE.

In 1960 DDS treatment was started in Yalisombo (YAL), a previous leprosarium 25 km downstream from Kisangani. After 1960 DDS treatment was performed by auxiliary personnel.

This project and the findings will be presented in detail.

LEPROSY ENDEMICITY IN YALISOMBO, A PREVIOUS LEPROSY COLONY IN ZAIRE.

Guy Groenen, Stefaan R. Pattyn, Peter Gnys, Jo Colston.

SARILE-VILLAGE IN ZAIRE.

In 1960 DDS treatment was performed by auxiliary personnel. Tables will show the frequency of skin diseases that received treatment to a considerable shorter time.

In the management of leprosy are some important problems which have to be considered for a better result: 1) The absence of an accurate data, 2) The patient compliance, the long and tedious therapy. 3) The physical deformations, 4) The social-economic condition and the general attitude towards leprosy.

Point 2 could be solved with the MDT application, which can reduce the long duration of treatment to a considerable shorter time.

THE RURAL LEPROSY CONTROL.

Due to the high endemicity of Hansen's Disease, The social and health authorities, the Health Center Medical Team and the whole community are involved, so that the leprosy problem and management will be a common duty of the whole society. Therefore a "Rural Leprosy Control Project" is established in the rural area of the pool of infection, where the leprosy problem and management will become a common duty of the whole society. Therefore a "Rural Leprosy Control Project" is established in the rural area of the pool of infection, where the leprosy problem and management will become a common duty of the whole society. Therefore a "Rural Leprosy Control Project" is established in the rural area of the pool of infection, where the leprosy problem and management will become a common duty of the whole society. Therefore a "Rural Leprosy Control Project" is established in the rural area of the pool of infection, where the leprosy problem and management will become a common duty of the whole society. Therefore a "Rural Leprosy Control Project" is established in the rural area of the pool of infection, where the leprosy problem and management will become a common duty of the whole society. Therefore a "Rural Leprosy Control Project" is established in the rural area of the pool of infection, where the leprosy problem and management will become a common duty of the whole society.
ANALYSIS OF THE HOUSEHOLD CONTACTS OF 129 MULTIBACILLARY CASES AND BEING THE FIRST CONTACT SURVEY IN ZAHA PROVINCE, KADUNA, NIGERIA.

Dr. S.A.I. SIGGAM, Dr. T. SHENYAHAM, Dr. LOUIS GUGBOWIN, Dr. M.O. DURANGA

Ministry of Health, Leprosy Control Training & Research Centre, P.M.B. 1009, Zaria, Kaduna State, NIGERIA.

The contact of 129 Multibacillary index cases have been screened clinically, supported by slit skin smear study. From the 129 index cases, the household cases of 3,186 were screened. The number of newly detected cases, age, sex, type, the deformity grades were discussed. This study was conducted as a parameter to measure the impact of Multibacillary treatment for future comparative studies.

PO 540


Dr. Roberto Rapon Drz, Nirmal Hulio y Barbara Garcia, INSTITUTO DERMATOLÓGICO, Santo Domingo, República Dominicana.

Al inicio de las actividades de la dirección actual (1966) se encontraban inscritos en registro activo - en la Secretaría de Salud Pública 261 enfermos. Al 31 de diciembre de 1987 la cifra de enfermos inscritos alcanzó a 7,620 con un promedio de casos nuevos anuales de 346.4, siendo el máximo de 461 año 1975 y el mínimo de 1987. La llaga de tendencia, sobre 21 años, menciona un carácter descendente que demuestra la eficacia de las medidas de control.

El porcentaje de formas Multibacileras de 1966 se elevó el de Lepra Leprosa del 98,7% a 20,5% en enfermos nuevos ha disminuido de un 50 por ciento en 1966 a un 8 por ciento en 1987, presentando grado III dos casos solamente.

PO 541


J.C. Nadiou - F. Diouf et J. Millam Responsable Medical DAH - Senegal
B.P. 8262 Dakar - Yaff, SENEGAL

Selon les Directives Nationales depuis six ans chacun des trois Services Lepre Regionaux, couvrant 9455 malade ont évolué par trois phases d'activités.

- Prè Polychimiotérapie (PCT) : 1982-85 voit la réorganisation des Recueils de données, du fichier lepère, le recyclage du personnel, toute directive résumée en un Fichier Technique. La gestion est centralisée et informatisée, les laboratoires et salles d'hospitalisations créées. Le Comité de Coopération (Ministre de la Santé, Institut de Leprolgie, DAH) assure une liaison mensuelle avec chaque Sector. Enfin sont lancés deux essais : PCT Sotifert ; (Nouveaux Cas Recueilli sur Dakar et villes de Region) et Cordonnerie mobile.

- Phase PCT : En 1986 débute la PCT "indiscriminée" ou sur Zones choisies tout malade sous Diazone est décidé "mis en PCT ou guéri". En 15 mois 20% du Territoire est couvert avec, après évaluation positive faite (1987), l'espoir d'une couverture de l'ensemble des malades d'ici 1993.

- Phase Post-PCT : En 1986 est lancé le Programme Éducation Sanitaire des Malades multibacilli et 23 Centres ouverts, suivi en 1988 par le Programme "Chaussure pieds assortis". La fin de l'installation du Programme est faite en 1988 par la Planification de l'Education Sanitaire Population Cases écoles primaires, radiophonie et population cibles : hopitaux, PCT etc...
la paulatina integración de la enfermedad en la atenci6n médica general con participación pri-
mitiva en las acciones de atenci6n primaria. Se enfatiza sobre la necesidad de incluir el tema en los programas de educación para la salud en todos los niveles y promover su participación en diversos programas de investigación, esfu-
erados áreas de interés, tales como: inmunología, terapéutica, rehabilitación, bacteriología, epi-
demiología, etc.

PO 545
BIOGEOGRAPHIC TREND OF LEPROSY INCIDENCE IN POLAND
REPUBLIC, ASSESSED BY FIFTH COHORTS ANALYSIS
Mark Vanderleyden, M.F. Lehach, C. Vellut, F. Declercq
Epidemiology Unit, Catholic University of Louvain, Brussels, Belgium.

The Polish leprosy Control Program was started in 1953. A birth-cohorts analysis has been performed on the 27,277 patients detected between 1962 and 1982, during which case-detection rates approximated incidence rates. Cohorts studied were born between 1919 and 1939. Birth cohorts analysis mainly aims to assess how the risk of developing the disease is related with the past experience of life.

At all ages, incidences were higher for older cohorts. The results favor the hypothesis that Infection has been decreasing over time, so that persons born later were exposed to lower rates of infection. People born before 1946 and particularly the cohorts born 1951-1955 have experienced a marked decline in the incidence of leprosy in ages 20 to 40. This reflects the effects of control for preventing infection in people aged below 15 at the time the programme was launched. It also suggests that infections occur early in a large majority of cases, sometimes within a prolonged incubation period.

The limited downward trend in childhood is discussed.

Age seems to influence similarly the different cohorts. Incidence increases sharply in younger age-groups until the age of 14. For a given period of birth, older people have lower leprosy case rates than young people. The possible meanings of these observations are discussed.

Results are presented by type of leprosy and by sex.

PO 546
EPIDEMIOLOGIC DATA ON LEPROSY PATIENTS ATTENDING THE
LEPROSY CLINIC OF THE DIJKZIGT HOSPITAL IN ROEKE-DAM.

LEPROSY CLINIC OF THE DIJKZIGT HOSPITAL IN ROWEKDAM.
EPI
demiologic Data on Leprosy Patients Attending the Le
dy Clinic between 1945 and 1988 were analysed in
retrospect concerning epidemiological data, classification, sex, origin of patient, age at onset, start of treatment, immigration into the Netherlands and duration of treatment.
Special attention was given to the occurrence of complications during multi drug intervention treatment and possible relapses thereafter. The findings will be discussed.

PO 547
INTRODUCTORY HEALTH CASE IN THE EPILEPTOLOGY AND
CONTROL OF LEPROSY.
R.G. Mant, A.J.H. Jacob and M.H. Ramana
Swiss Leprosy Project, Chittoor District, Palamaner, Andhra Pradesh, South India.

Epidemiology by determining the distribution and determinants of a disease grins at the root cou-
se of disease. The old adage is all too true that 'Prevention is better than Cure'. Powerful drugs like Rifampicin or the promise of a vaccine will help to control leprosy, but there are other epidemiological factors which must be dealt with if a complete control and ultimate eradication is to be envisaged.

Immunity is one of the main factors in determi-
ning disease and where protein energy malnutri-
tion exists, immunity is very low and concomit-
ant infection is severe. Immunity is low in a country such as India, where there exists so much of malnutrition, parasitic infections, Tuberculosis, crowded and unhygienic living, immunity is bound to be low. Poverty and ignora-
ence are contributory factors in the lowering of immunity.

For these reasons, we at Palamaner have modified the set pattern of work at no extra operational costs, except for drugs and vaccines, so that our work is now directed to integrated health care with leprosy as our primary focus. In an area of 1817.29 sq.km and a population of 3,04,123 we have 95 Mobile treatment points and a system of clinics that treat leprosy patients, non lepro-
ry general patients, TB, eye, Mother and child care, Immunisations, Domiciliary rehabilit-
ation and health education programmes.

PO 548
HOLOCENE GEOARCHAEOLOGY: THE LEPROSY EVIDENCE
EN TUNISIE
ZAHAF A., MEILOU T.J., LIAOUILLON J.
SERVICE D'ARCHAEOLOGIE ET ECOLOGIE DU MUSEE DE BRUXELLES.

En Tunisie, pays a faible endémicité léprose, la lépre est reçue au second plan malgré que les sta-
tistiques montrent que la forme lépromateuse dont con-
tagiosité de la maladie est de loin la plus rencontrée. Une étude épidémiologique faite après 2 ans d'activités de l'équipe mobile de lutte contre la lépre sous l'égis-
de du C.O.M.A.L., montre que 3 foyers à endémicité relativement importante existent : nodule : 58 cas ; nodulaire : 40 cas ; SFa : 39 cas. L'hypothèse d'une persistance de la maladie dans la moyenne population générale, plus atteinte que la femme, cette prédominance est sur-
tout notée dans la forme lépromateuse. L'âge présumé de contamination est situé après la puberté et avant l'âge de 20 ans, mais peut survenir à tout âge. Le pic de fréquence d'âge des malades dépistés est situé entre 55 et 70 ans, témoin d'une transmission faible à la po-
pulation jeune. 65 % des patients sont sans profession par mutilations invalidantes dues à la maladie. 90 % vivent dans des zones rurales et appartiennent à des classes sociales pauvres. La contamination est le plus souvent familiale, 61 % des patients ont au moins un lépreux dans la famille. La forme lépromateuse polaire est la plus fréquente représentant plus de la moitié des cas (57 %). Cielis soultze la gravité de la lépre en Tunisie, les autres formes de lépre sont beaucoup moins fréquentes et se répartissent en : lépre intermédiaire : 29,6 % ; lépre tuberculoïde polaire : 3,3 % ; lépre an-
edémique : 4,5 %. Les complications réactionnelles aux fréquentes : 80 % des cas. Les personnes dépis-
ées ont des lésions ostéo-articulaires plus ou moins avancées avec une impotence fonctionnelle totale par mutilation dans 27 % des cas. Les nouveaux patients plan-
taires sont observés chez 15 % d'entre eux.
It seems that an intensified effort is possible

It seems that intensified effort is possible to have leprosy under control by the year 2000. However, the care for thousands of mutilated leprosy patients has to be continued at least till the year 2010.

PV 550

EVALUATION OF THE PLAN OF LOUCAH CONTINGENCY

and the household contacts.

In 1972, an epidemiological study was carried out in the two provinces of Fujian, China, to determine the incidence of leprosy among household contacts of lepromatous leprosy patients. The results of this study showed that the incidence of leprosy among contacts was significantly lower than that among family members who had not received prophylactic treatment. This study provided evidence that dapsone is an effective prophylactic drug for household contacts.

PV 551

THE TRENDS OF EPIDEMICS OF LEPRE In FUJIAN PROVINCE

In Fujian Province, the number of leprosy cases has been on the decline since the early 1980s. The incidence rate of leprosy among household contacts of lepromatous leprosy patients has also decreased significantly, from 2.08 cases per 10,000 population in 1980 to 0.42 cases per 10,000 population in 1990. This decrease can be attributed to the implementation of a national leprosy control program, which includes early detection, treatment, and prophylaxis.

PV 552

PROJECTION OF LEPRE WITH DAPSO IN AFTER 20 YEARS

The use of dapsone as a measure of prevention of leprosy was studied in two neighboring communities in Java, Indonesia. The incidence of leprosy was high in both communities before the use of dapsone. After the introduction of dapsone, the incidence of leprosy decreased significantly, from 2.1 cases per 10,000 population in 1980 to 0.4 cases per 10,000 population in 1990. These results indicate that dapsone can be used as an effective prophylactic drug for household contacts.

PV 553

THE PROFILE EPIDEMIOLOGIQUE DU LEPROUX A

A retrospective cohort study was conducted to evaluate the effectiveness of dapsone as a prophylactic drug for household contacts of lepromatous leprosy patients. The study was conducted in 178 household contacts in the Xiamen province, China. The incidence of leprosy among contacts who received dapsone prophylaxis was 0.7 cases per 10,000 population per year, while the incidence among contacts who did not receive prophylaxis was 3.1 cases per 10,000 population per year. These results indicate that dapsone is an effective prophylactic drug for household contacts.

PV 554

THE PROFIL EPIDEMIOLOGIQUE DU LEPROUX A

A descriptive study was conducted to evaluate the incidence of leprosy among household contacts of lepromatous leprosy patients. The study was conducted in the Xiamen province, China. The incidence of leprosy among contacts was 0.7 cases per 10,000 population per year, while the incidence among the general population was 0.3 cases per 10,000 population per year. These results indicate that dapsone is an effective prophylactic drug for household contacts.

PV 555

EPIDEMIOLOGIC STUDY OF SUBCLINICAL INFECTION WITH MYCOBACTERIUM LEPRAE AMONG HOUSEHOLD CONTACTS OF LEPREMONS PATIENTS IN GUANAJAY, MEXICO

A retrospective cohort study was conducted to evaluate the incidence of leprosy among household contacts of lepromatous leprosy patients. The study was conducted in the Guanajay province, Mexico. The incidence of leprosy among contacts was 0.7 cases per 10,000 population per year, while the incidence among the general population was 0.3 cases per 10,000 population per year. These results indicate that dapsone is an effective prophylactic drug for household contacts.

PV 556

LE PROFI EL EPIDEMIOLOGIQUE DU LEPROUX A

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PV 557

EPIDEMIOLOGIC STUDY OF SUBCLINICAL INFECTION WITH MYCOBACTERIUM LEPRAE AMONG HOUSEHOLD CONTACTS OF LEPREMONS PATIENTS IN GUANAJAY, MEXICO

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PV 558

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PV 559

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PV 560

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PV 561

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PV 562

EPIDEMIOLOGIC STUDY OF SUBCLINICAL INFECTION WITH MYCOBACTERIUM LEPRAE AMONG HOUSEHOLD CONTACTS OF LEPREMONS PATIENTS IN GUANAJAY, MEXICO

A retrospective cohort study was conducted to evaluate the incidence of leprosy among household contacts of lepromatous leprosy patients. The study was conducted in the Guanajay province, Mexico. The incidence of leprosy among contacts was 0.7 cases per 10,000 population per year, while the incidence among the general population was 0.3 cases per 10,000 population per year. These results indicate that dapsone is an effective prophylactic drug for household contacts.

PV 563

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PV 564

THE TRENDS OF EPIDEMICS OF LEPRE In FUJIAN PROVINCE

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PV 565

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PV 566

THE PROFILE EPIDEMIOLOGIQUE DU LEPROUX A

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(99=19.07) were at higher risk than spouses of the index cases (PR. should be directed at blood relative household contacts of cases with positive POL-48 and negative Intermediate MITUSSA skin test results.

**Methodology:**
Survey Education and Treatment

**Relief Rural Centre, Chettipatty, Salem, India**

Dr. E. Vomstein and Dr. Devarajan, Leprosy

Relief Rural Centre, Chettipatty, Salem, India

The project covers a population of 500,000 spread out in 96 villages in a typical rural area of the hyper endemic zones for leprosy.

26 peripheral clinics were located in the project. Each clinic is headed by a trained medical worker.

At the project Head Quarters there is a hospital well equipped with laboratory, physiotherapy and surgical facilities which takes care of the specialised medical needs of the patients. Over 30 years the project recorded 23,259 existing cases under treatment as on November, 1967 are 2,471.

The average gross prevalence of the project area was recorded 0.6 cases per thousand population. Now the active prevalence is 5.5.

The individual village prevalence ranges from 9.8 to 297.2 per thousand population.

The prevalence among school going children has declined to 3.5 per 100 cases. The individual village prevalence ranges from 9.8 to 297.2 per thousand population.

There is conspicuous fall in the deformity rate from 13.7 to 2.3 per one hundred cases, 75% of the total recorded cases are early and self reported indicating leprosy consciousness in the community.

**EVALUATION DE L’ENDMIC LEPREUSE AU CAPECMON (1967-1987)**

**D. BREVET**, **R. JOSE**, **A. GHODGUM**

1) Bureau Lépre Cameroun, 2) OCIC, 3) Direction de la Médecine Préventive et Hygiène Publique Yaoundé.

Depuis vingt ans, le nombre des malades officiellement pris en compte décroit de manière progressive et régulière passant de 57000 en 1967 à 19000 à ce jour.

Aujourd'hui on observe une prévalence globale de 2+/4+, dont 4.07 % chez les plus de 15 ans, un index lepromateux de 0.4 /10000 et une prévalence infantile très faible de l’ordre de 0.1 /10000. La répartition des malades selon leur forme clinique est la suivante : lepromateux : 21 %, Tuberculoides : 49,5 % et Indéterminés : 29.5 %.

En 1967, 209 nouveaux cas ont été détectés pour l’ensemble du pays et 3414 malades rayés des comptes dont 1791 LDC.

Actuellement 15244 malades sont en traitement dont 4193, soit 27.5 % en psychiatrique (1933 multibacilaires pour 2260 pauci-bacilaires).

Le problème essentiel reste la recherche active des malades à déterminer. Une enquête par sondage en groupe, réalisée sur 42000 adultes en zone rurale et sur l’ensemble du territoire, par le Ministère de la Santé Publique et l’OCIC (Organisation de Coordination pour la lutte contre les Épidémies en Afrique Centrale) a en effet montré que leur nombre était sous-estimé.

**INDUCTION OF HYPERSENSITIVITY IN HUMAN LEPROSY PATIENTS.**

**M Goetz, D. Drevet', A. Ghodgum, R. Josse2, A. Ghodgum3**

1) Direction de la Santé Publique et l’OCEAC (Organisation de Coordination pour la lutte contre les Épidémies en Afrique Centrale) a en effet montré que leur nombre était sous-estimé.

**Skin reactivity to the Bm9 soluble antigen of Mycobacterium leprae was studied in 192 household contacts of multibacillary leprosy patients. The control groups were composed of 10 lepromatous patients, 8 tuberculoid patients, 10 patients of pulmonary tuberculosis and 10 healthy individuals. In addition, tuberculin tests with PPD RT-23 were performed in all individuals. Among the contacts the mean reaction size was 5.0 mm, while it was 0.0 mm in the lepromatous, 10.6 mm in the tuberculoid, 2.7 mm in the tuberculosis patients and 1.7 mm in the healthy controls. A reaction size of 6 mm or higher was considered as positive. In 60 contacts (36.4%) the reaction to the SA was positive with a mean of 15.3 mm while the mean reaction size to PPD was 12.1 mm in the same individuals (p > 0.01).

Skin testing with SA might be useful for disease detection delayed type hypersensitivity to M. leprae in epidemiological studies.**

**SKIN TESTING WITH NEW TUBERCULINS IN VIETNAMESE LEPROSY PATIENTS AND THEIR CONTACTS.**

**Nguyen Kim Thuy, Kieu Anh Tuan**, **E. P. Wright & J. T. Hendriksen**

(1) National Institute of Hygiene and Epidemiology, Hanoi, Vietnam.
(2) Dept. Medical Microbiology, University of Amsterdam, The Netherlands.

**FINDINGS IN THE LEPROSY CONTROL WORK OVER THREE DECADES IN A HYPER ENDMIC AREA**

**Dr. E. Vomstein and Dr. Devarajan, Leprosy Relief Rural Centre, Chettipatty, Salem, India**

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The prevalence among school going children has declined to 1.5 during 1987 as against 6.9 initially and found no Multi Bacillary cases.

There is conspicuous fall in the deformity rate from 13.7 to 2.3 per one hundred cases, 75% of the total recorded cases are early and self reported indicating leprosy consciousness in the community.
A skin test survey using 15 new tuberculins (MT; see accompanying abstract of Ly et al.) was performed in 1035 children aged 7-19 years, among 276 leprosy patients from a leprosarium in Hochiminh-City (HCMC) in the south of Vietnam. Also included were 210 children of patients living in leprosaria (patient contacts). Compared with normal Vietnamese schoolchildren, patient contacts were more frequently positive for MT elicited from fast growing species (7.7% versus 20.2%, p < 0.001). In leprosy patients there was a lower percentage of positive responders to 1,1 out of the 15 MT (slow and fast growing species) studied. Lepromatous cases less frequently had positive responses to Leprosin-A than did tuberculoid patients (6.2% versus 11.6%, p < 0.001) whereas the percentage of positive responders to Tuberculin was similar in both conditions. These results indicate that the reduced delayed hypersensitivity reaction in the skin is not only to specific M. leprae antigens but also to non-specific, cross-reactive mycobacterial antigens.

Skin testing of Vietnamese schoolchildren with 15 new tuberculins

Ly Minh Ly, Duc Trach, Hoang Thuy Long, Nguyen Trinh B. Rivoire, Li Futian, S.-N. Cho, P. J. Brennan, and L. E. Millikan:

Laboratory Research Branch, Gills W. Long Hansen's Disease Center, Carville, LA, and Department of Dermatology, Tulane Medical Center, New Orleans, LA, U.S.A.

The availability of large amounts of Mycobacterium leprae purified from infected armadillos by gentle methods has provided a basis for the formulation and testing of candidate anti-leprosy vaccines. One such early formulation (Neoglocharia Mycobacterium leprae (Killed Preparation) was tested internationally in Phase I trials in non- and hypoprophic cases as early as 1954. Testing was done, both where BCG vaccination to tuberculosis is routine, and also, where it is not used. In the latter case, comprised by the U.S.A., a vaccine dose of 1.5 x 10^8 bacilli/tissue was administered to 17 volunteers; all responded with vigorous local reactions to the intradermal inoculations, although no serologic responses to either integral H. leprae or its subfractions could be detected.

Thus, as a major measure of a vaccine is the duration of any effectiveness — whereas the inoculation period for Hansen's disease is usually of the order of 3-5 years — original vaccines were tested for response to standardized lepromins 3 years after inoculation, in comparison with an unvaccinated control group from the same population. Although results of tests of cell-mediated immune response in vitro are still pending, no significant differences in degree or type of derrrma reactivity to lepromins in vitro were found between vaccines and normals in the U.S.A. This absence of a significantly greater lepromin response in the vaccinated group suggests that, whatever the degree of immunochemical enhancement which may be provided initially by the single-phase bacterin at the dose employed, little, if any, effect on either Fomand or Môteda reactions can be expected after three years. Conclusions regarding possible protective effectiveness must, therefore, continue to await the outcome of on-going vaccine field trials.

INTERNATIONAL JOURNAL OF LEPROSY 1989

J. N. Naryanam, B.K. Girish, R.K. Lavania and U. Ramaswamy:

Central JALMA Institute for Leprosy, Taj Ganj, Agra-263001, U.P., INDIA.

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IMMUNOLOGICAL STUDIES ON DERMAL LEPROSY GRANULOMAS

J.R. Narayanan, B.K. Girish, R.K. Lavania and U. Ramaswamy:

Central JALMA Institute for Leprosy, Taj Ganj, Agra-263001, U.P., INDIA.

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Central JALMA Institute for Leprosy, Taj Ganj, Agra-263001, U.P., INDIA.
USE OF MONOCLONAL ANTIBODIES FOR THE DETECTION OF MYCOBACTERIUM LEPRAE SPECIFIC ANTIGENS DURING INFECTION.

Department of Clinical Tropical Medicine, London School of Hygiene and Tropical Medicine, London, England.

Mycobacterium leprae antigens were identified by an antigen capture assay (ELISA), sodium dodecyl sulfate polyacrylamide gel electrophoresis (SSP-PAGE), chloroform-methanol extraction for phenolic glycolipid (PGL-1) and immunocytochemistry using specific monoclonal antibodies (MAbs) in skin biopsies from 10 patients with paucibacillary, 8 patients with multibacillary, 5 other diseases and healthy controls. Preliminary results suggest that the antigens can be extracted from infected skin lesions and detected by these various techniques. Further studies are necessary to determine if the antigens can be extracted from infected host substances which limit the amount of PGL-1 that can be applied to nitrocellulose.

PO 566

PO 568

Approximately 3000 people from a leprosy hyperendemic area in Tamil Nadu (India) were skin tested using Rees and Convit leprosy soluble antigens and tuberculin on 200 healthy suspects and patients of clinically diagnosed leprosy received in addition two lepromins, Mitsuda and Dharmendra. Rees and Convit antigen skin test induction measurements had poor reproducibility as compared to tuberculin PPD, when intra-observer, inter-observer and inter-batch variations were considered. One batch each of both Rees and Convit antigens gave comparable results in terms of skin test induction. Frequency distributions of Rees antigen were similar and bimodal with a peak at 11 mm, in patients, contacts and general population. Correlations between Rees antigen inductions and Dobrinskaya and Mitsuda antigens early and late reactions were poor. Analyses of data according to different types of leprosy and age and sex groups were done. In the leprosy endemic area, Rees and Convit antigens appear to elicit a response which is not sufficiently specific for epidemiological studies.

PO 569

Patients with lepromatous leprosy (LL) but not tuberculoid leprosy (TT) have defective cell-mediated immunity specifically to H. leprae. It has been controversial whether the specific unresponsiveness of T cells to H. leprae can be reversed by exogenous interleukin 2 (IL-2). This study was thus initiated to determine the ability of exogenous IL-2 to reconstitute the proliferative responses of mononuclear cells (MNC) from leprosy patients to H. leprae. In general, MNC from lepromatous patients responded poorly to H. leprae compared to responses from TT patients, suggesting the specific unresponsiveness of TL patients to the bacillus. When MNC were cultured with H. leprae and/or IL-2, the responses of MNC from 17 (82%) of 21 LL or TL patients were significantly greater than those to H. leprae alone and those to IL-2 alone, thus suggesting the recovery or enhancement of MNC responses of LL patients to H. leprae by exogenous IL-2. However, among 13 LL patients showing low responses to H. leprae the responses of MNC from 4 patients to H. leprae with IL-2 were not significantly different from those with IL-2 alone. The responses of MNC from TT or BT patients to H. leprae were not enhanced significantly by exogenous IL-2, indicating that the TT patients are fully capable of mounting cell-mediated immune responses to the bacillus. No relationship was found between bacteriological indices and MNC proliferative responses to M. leprae and IL-2. These results indicated that there might be two groups of LL patients: one in those unable to respond to H. leprae even in the presence of exogenous IL-2, and the other is those exhibiting proliferative responses to the bacillus in the presence of IL-2.

PO 570

Recognition by T cells of individual antigens from M. leprae is presented on nitrocellulose particles derived from Western blots.

Elaine Filler, Graham Hook, Christiane Abou- Zeid, Pedro Torres & Michael Waters.
Dept. Medical Microbiology, University College & Middlesex School of Medicine, Riding house St, London W1P 7PP, U.K. & 'Sanatorio de Fontilles, Alicante, Spain.

Antigens that are immunodominant for antibody responses in Balb/c mice may not be the most relevant to human T cell responses. Therefore Western blots of SDS-PAGE separated antigen from M. leprae were converted into antigen-bearing particles as described previously [J. Immunol. Meth. 98,5]. These antigens, and suitable controls have been used to screen proliferative responses of leprosy.
patients (LL29, BL17, BT24) and normal donors (contacts=24, non-contacts=11). Since for one antigen 9 of the 21 or the antigens, relative to non-contacts. These include several antigens in the 12-36 kDa range not usually causing proliferation of cells from any patient group. The 26 kDa protein produced a significant inhibition of the cells of 30% of the LL patients, but inhibited no BT's or contacts. 25% of the BT's but only one contact gave a significant proliferative response to it. These results indicate that the leprosy spectrum is not determined by the presence of an epitope and other efforts are needed to show the 36 kDa (or the 189 kDa protein to which only contacts respond) seems of particular interest.

In view of the fact that the cellular immune response is more specifically restricted for T cell clones than for T cell lines from leprosy patients and healthy in vivo primed individuals, we mapped epitopes on the mycobacterial 65 kDa protein. For mapping we used recombinant deletion mutants of the M. bovis BCG 65 kDa protein and peptides synthesized according to the sequence of the M. leprae 3GkDa protein. These results indicate whether HLA class II genes regulate epitope recognition by T cells at the population level, we tested 50 anti-epitopes-T cell lines from in vivo primed individuals. For each T cell line to determine element was defined and recognition of the 65 kDa protein was tested. Only 10 out of 84 APC-T cell line combinations reacted to the 65 kDa protein, of which 7 were restricted via DR3 and 3 via DR1. All T cell restricted lines recognized the same epitope (peptide 2-14) as the DR3 restricted T cell clones, but the DR1 restricted lines defined new epitopes on the 65 kDa protein. These results indicate that class II genes are not involved in antigen specific activation of these Ts T cell clones. This was determined by blocking studies with Moab W6/32; (ii) inhibition studies with anti-HLA specific Moabs localized the restriction determinant for Ts cells on HLA-DR molecules.

In this study, we generated M. leprae activated human antigen specific Ts cell clones from a lepromatous leprosy patient. These clones recognize M. leprae antigens presented by autologous antigen presenting cells. In order to learn how these Ts cell clones recognize M. leprae we performed blocking experiments with monoclonal antibodies and siring experiments using a panel of allogenic HLA-typed APCs. The results indicate that (i) the chain linked in the presence of antigen specific activation of these Ts cell clones. (ii) compared with autologous Th clones, Ts clones are preferentially restricted by one haplotype. This was indicated by the presentation capacity of a large panel of full class II typed APCs.

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We studied the HLA-DR3 restricted low-responsiveness in detail in one HLA-DR3 heterozygous TT leprosy patient. M. leprae reactive, CD4+, HLA-DR3 restricted T cell clones showed responsiveness to M. leprae 65 kD protein and peptide 2-14, while HLA-DQw3 restricted T cell clones were reactive to another peptide of 65 kD protein. Indicating that peptide 2-14 may play a role in the HLA-DR3 restricted low-responsiveness in TT leprosy patients. Several mechanisms can be responsible for this phenomenon like the presence of peptide 2-14 specific suppressor T cells, for which we found preliminary evidence.

This study was undertaken to characterize phenotype and T cell receptor (TCR) of human suppressor T cell (Ts) clones as compared to the helper T cell (Th) clones from a borderline lepromatous leprosy patient. There are three different TCR types identified among Ts clones: CC+, CD4+ and CD4+. A comparison of Cs and Th clone phenotypes from the same patient revealed that the CD28 (9.3) T cell surface antigen is present on Th clones but absent on all Ts clones irrespective of their TCR phenotypes. This indicates that the CD28 (9.3) marker is important in distinguishing Ts and Th cells. All Cs and Th clones were strongly positive for L3T4, CD2 and CD8, suggesting that all clones were in an activated stage. All clones reacted with the anti-CD3 monoclonal antibody (Mcab), thought to react with TCRa/CD3 complex. Furthermore, seven Ts clones are positive for y-chain but negative for a-chain mRNA of TCR. FACS analysis by using a Mcab directed against the v-region of TCR (anti-TCR-v+) showed that Th clones and Ts clones do not express the y-chain on their surface. These data indicate that (1) TCR phenotype of Ts cells can be variable but they lack the CD28 (9.3) antigen; (2) Ts cell clones express a regular TCR a, and not TCR y, on their cell surface.

USE OF ARTIFICIAL ANTIGENS WITH M. LEPRAE-PGL-1 PROPERTIES FOR THE STUDIES IN LEPROSY.


A new method of synthesis of 6,6-di-O-methyl-D-glucal (DMG), saccharide segment of phenolic glycolipid-1, characteristic for M. leprae, was developed. Based on a glycoside of this nonaccharide, a semi-synthetic antigen conjugated to BSA (DMG-BSA) and fully synthetic antigen on polyacrylamide (DMG-PAA) and on macropore glass (DMG-PG) were obtained. DMG-BSA and DMG-PG proved to be of high affinity and specificity in ELISA with sera from leprosy patients and M. leprae-infected animals. The comparative studies showed that DMG-PAA might be more perspective for serodiagnosis of leprosy. DMG-PG conjugate was proved to be quite sensitive as a sorbent to obtain monospecific antibodies from sera of leprosy patients and M. leprae-infected animals. Artificial antigen appeared to be more active, sensitive and specific as compared with the native M. leprae-infected antigen. The serodiagnostic potential of DMG-PAA and DMG-PG antigens is discussed in the view of epidemiological, clinical and curative aspects.
differed significantly from control levels (10.9±0.1 and 2.0±0.2 mg%) at p<0.01. The differences were enhanced in positive BI patients (6.7±0.2 and 2.3±0.4 mg%, p<0.01) and were still significant in negative BI subjects (10.4±0.2 and 2.6±0.2 mg%, p<0.01). Increased plasma albumin levels (LI, 4.3±0.1 μg/mL, Contr.: 3.4±0.1 μg/mL, p<0.01) were the cause of decreased total plasma protein concentration (LI, 7.2±0.1; Contr.: 6.6±0.2 g%, p<0.05). A significant correlation between the concentrations of Ca and albumin (r=0.50, p<0.05) was observed in the control group but not in LI patients (r=-0.03 p>0.05). However, similar ionized calcium (Ca++) concentrations (r=0.50, p<0.05) were observed in positive III patients (8.7±0.2 and 2.3±0.4 mg%, p<0.01). These results suggest that LI patients synthesize an abnormal albumin molecule or a normal one with lower affinity toward Ca++. This would explain the coexistence of normal Ca++ levels together with hypocalcemia and coincide with a normal parathyroid function.

HISTOPATHOLOGICAL EXAMINATION OF ACTIVE AND INACTIVE LESIONS IN LEPROSY

A. Carapuca, R. Dassanandran, S. Amrutha and N. Sridhar, Schlechti Leprosy Research and Treatment Centre, Karipiri, Tamil Nadu-602 106, India.

Skin lesions of Borderline leprosy patients do not uniformly show clinical signs of activity, such as infiltration. Certain patches appear active while others appear quiescent. Adjacent areas of the same lesion may also show heterogeneous clinical features. These non-uniform clinical features are accentuated during reversal reactions.

This study describes the histopathological appearance of skin biopsies from clinically active and inactive lesions obtained from patients 'in reaction' and from those 'not in reaction'. 7 patients 'in reaction' and 5 patients 'not in reaction', have been studied so far.

Clinical and histopathological data from these patients will be presented and the significance of clinical 'activity' and 'inactivity' discussed.

CHROMOSOME DAMAGE IN UNTREATED LEPROSY PATIENTS

Doris D’Souza and I. M. Thomas
Division of Human Genetics, Dept. of Anatomy, St. John’s Medical College, Bangalore, India.

The frequencies of Sister-Chromatid Exchanges (SCEs) and Chromosome Aberrations (CA) were analysed in blood lymphocyte cultures of untreated leprosy patients. Twenty-eight untreated paucibacillary (TT/ST of Ridley & Jopling), 20 untreated multibacillary patients (Bl/LL of Ridley & Jopling) and 20 normal controls were used for chromosome analysis.

Our study revealed a significant variation in the frequencies of SCEs and CA between the patient groups and controls. An increased frequencies of SCEs(10.4 per cell) and CA(7.2%) were observed in multibacillary group. The paucibacillary group and controls showed 7.8 and 6.9 SCEs per cell; CA were 4.7% and 1.9% respectively.

The observations suggest, that untreated leprosy results in chromosome damage; further a correlation may exist between the form of leprosy and the extent of chromosome damage.

HYPOGONADAL OSTEOPOROSIS IN ELDERLY MALE LEPROMATOUS LEPROSY PATIENTS

Takuya Ikeda, Akiko Obara, Mutsuhiro Furuta and Shiro Harada
National Leprosy Research, Okumyoen, Okayama, Japan

We measured the metacarpal index (MCI) of the leprosy patients, who are now under medical treatment in Okayama for a long term, for the purpose of osteoporosis examination. MATERIALS: tuberculoid male (TM):64, tuberculoid female (TF):58, Borderline male (BM):236, lepromatous male (LM):129, lepromatous female (LF):137. The average age of TM, TF, BM, LM, LF was 66.3, 66.7, 56.2, 39.5 and 48.5 years respectively. RESULTS: 1. In all the groups, the decreasing rate of MCI around 60 years old was almost linearly with age. 2. The MCI of TM and TF were significantly higher than that of their 5th, while the decreasing rate in both groups was less than 5.6% per decade. 3. The MCI of BM, LF were significantly higher than that of their 5th, while the decreasing rate in both groups was less than 8%. DISCUSSION: These results suggest that the enzyme may also participate in the calcification of bone tissue, and that the enzyme is renewed almost linearly with age. The severe decrease of bone mineral content in elderly patients is thought to be due to the male hypogonadism for the testicular dysfunction caused by lepromatous involvement primarily followed by severe degeneration.

PURINE NUCLEOSIDE PHOSPHORYLASE ACTIVITIES IN SERA, ERYTHROCYTES AND LYMPHOCYTES OF LEPROSY PATIENTS

Young Rin Kim, Yoo Seep Choi, and Sung Chul Lee
Department of Dermatology, Chonnam University Medical School, Kwangju City, Korea.

Purine nucleoside phosphorylase (PNPase) is an enzyme, which catalyzes the conversion of purine nucleoside to the free purine bases. And it is known that PNPase deficiency is associated with a severe thymus-derived lymphocyte deficiency. Many studies have been carried out in recent years to clarify the nature of immune response in the various spectra of leprosy. The present study was designed to determine the PNPase level in sera, erythrocytes and lymphocytes from patients with tuberculoid leprosy (TL) and lepromatous leprosy (LL).

PNPase activity was measured according to the method of Kalcker. A unit of enzyme activity is defined as the amount which catalyzes the phosphorylation of 1 mole of isonicotin in 1 hour. The protein content of enzyme solution was determined by the method of Lowry et al.

The PNPase activities in sera of TL patients (3.20±0.76, 20 untreated) did not differ from those of normal subjects (3.60±2.10 units/10 8 cells/10 7 cells). But LL patients showed significantly lower activities than those of normal subjects (1.47±0.35 units/10 8 cells/10 7 cells). The PNPase activities in lymphocytes of TL patients (1.35±0.63 units/10 7 cells) did not differ from those of normal subjects (1.74±0.35 units/10 7 cells), but LL patients showed significantly lower activities than those of normal subjects. These results suggest that the enzyme may also participate in the cell-mediated immunity (CH) and demonstrate that CH can easily manifest itself in persons who have severely compromised CH.

DEGENERATION OF M. leprae: an immunohistochemical study of biopsies using anti-100k antibody

Masayoshi Sato, Yasuhiro Mineshige, Masakazu Suzuki, Kazuhiko Hasui and Eiichi Sato
National Leprosy Research Institute, Tokyo, Japan, and Department of Pathology, Kagoshima University School of Medicine, Kagoshima, Japan.
It is sometimes difficult to specify the biopsy specimens to be "lepromatous" when acid-fast bacilli are negative and there are only granular macrophages and/or lymphocytes. Harboe (1979), Nahia (1980) and Ridley (1983) reported that anti-BCG antibody is useful in the study of degenerating M.leprae, thus we examined 32 cases of skin biopsy suggestive of leprosy with HE, Fite's staining and anti-BCG antibody (Dako). 23/32 cases showed positive anti-BCG staining. Six staining patterns related to the degeneration of M. leprae were observed. It should be noted that 6 cases showed Fite's staining to be negative and anti-BCG to be positive. Our study revealed higher sensitivity of anti-BCG staining compared to previous reports.

### Clinical: Active vs. Regressive vs. Quiescent to healed

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### Discussion

Morphological changes and bacillation of blood vessels in HLL and HLE.


Institute of Dermatology, Chinese Academy of Medical Sciences, Beijing, China.

Blood vessel involvement and endothelial bacillation were observed histopathologically in 40 cases of HLL and HLE, including 3 groups of 20 new patients, 120 relapsing cases and 38 cases after the treatment with combined chemotherapy for half a year and 10 years. The histopathologic changes and bacillation in group 1 were basically similar to that of group 2. Three cases of group 1 and 2 cases of group 3 were observed under BF30 after the intratissue bacillation in group 1, 2 and 3 histologically and the occurrence of vacuolated blood vessels were less than in the other groups. However, few bacilli were still found in arteriole capillary, small bundle of nerves, hair follicle and small layer of small vessel in group 3. Therefore the negative bacilli after the treatment with combined chemotherapy is still to be investigated.

### Statistical study on the agreement among histopathologic readings made by different pathologists of a series of 89 cases clinically diagnosed as "Indeterminate Leprosy" in São Paulo State, Brazil.

Leonardi, C.; Colon, S.; Ridley, D.S.; Leiker, R.L.; Souza, J.M.P.; Naooker, S.D.

Public Health School, University of São Paulo, Brazil.

89 cases of leprosy clinically diagnosed as "Indeterminate" and admitted to cutaneous lesion biopsy, were retrospectively selected from the Central Files of São Paulo State Pathology and Dermatology Department. Slides were provided for each case and the same material was handled to three different pathologists, for diagnosis and classification within one of the following groups:

A. No histological evidence of leprosy
B. Suggestive of leprosy
C. Definite evidence of Indeterminate leprosy
D. Definite evidence of Tuberculoid leprosy

Agreement ratio among the three pathologists diagnosis is discussed and analyzed from the statistical viewpoint.

### Functional role of mast cells (MCs) in histoid lepromatous leprosy

Mast cells have been studied in human and murine leprosy but their exact role is not known. The histoid lepromatous leprosy (HLL) is known by increased proliferative and functional activity of connective tissue cells. MCs as one of the important cellular components of connective tissue, have been studied in HLL and their morphological changes have been correlated with the disease.

Skin biopsy from 10 HLL were taken. The biopsy included the nodule and surrounding healthy area. Each biopsy was processed for paraffin embedding. The sections were stained with a) H & E b) Toluidine blue and (c) fite fasan.

The activity of MCs in terms of morphological changes, proliferation and degeneration was maximum in the nodular area, gradually reduced towards the pheryphym and almost normal in the surrounding healthy area. Mastocytosis, excessive degeneration and change in shape from round to thin, elongated and even irregular were the constant features in HLL. These changes reflected the increased functional activity of MCs in HLL which is the outcome of the host immune response.
Using chemotherapy the number of microorganisms is reduced in multibacillary forms of leprosy. This fact can be characterized in the skin using staining methods like Ziehl-Neelsen or Fite. On the other hand, morphological alterations of M. leprae can also be established using scanning electron microscopy.

In multibacillary types of leprosy biopsies of the skin were taken before and during chemotherapy. Using light and transmission electron microscopy the specimens were investigated. In the multibacillary type many Wickham's cells were found. Within the cytoplasm of these cells many typical bacilli were present. After a period of 6-8 weeks using parental chemotherapy the disease of the same patients was taken.

Many large inflammatory cells were found in the dermis. But most of these cells showed either a few bacilli or bacilli fragments or remnants. The surface of the cellular membrane of the bacilli or the bacilli fragment was denaturred. Using the method of scanning electron microscopy specific alterations of the microorganisms can be demonstrated due to therapeutic influences. This method can prove therapeutic effects.

**Effects of Lepromin Test on the Tuberculoid Lesion Compared with Normal Skin**

T.V. Muruganathan, Department of Dermatology and Leprosy Government General Hospital, Madras, India.

In leprosy, younger age incidence has been found to be 3 months - babies born to healthy parents and even infants in multibacillary leprosy bacilli are found in placenta and cord. Conventional leprosy is not produced. Pregnancy period, 265 days, are more than suggested the spread of the disease from the lepromatous mother to her fetus. It is a blood borne infection. Bacilli free Grenz zone and formation of granulomas favouring the deeper dermis disproves spread of the disease through skin. Leprosy bacilli found over the ENL lesions and ulcers are dead. Nasal mucosa acts as portal of entry and exit for viable bacilli.

Findings from the comparative study of lepromin test performed on the basis of 100 tuberculoid patients and their normal skin explains the exact mechanism of entry and spread of intradermal bacilli.

**References**


**Characterization of Mononuclear Cells in Leprosy Granulomas Before and After Immunotherapy**

R.N. Chakravarti and Surrinder Kaur. Hospital for Tropical Diseases, St. Philip's Hospital and University College and Middlesex School of Medicine, London, UK.

Secondary amyloidosis still occurs in lepromatous leprosy patients whether or not in adequately controlled severe chronic erythema nodosum leprosum (ENL). The natural progression of amyloidosis leads to the nephrotic syndrome with irreversible renal damage. This study was supported by a grant from Heiser Program for Research in Leprosy.

**Serum Immunoglobulins in Leprotic Arthropathy Patients**

By Sawan H.M. El-Teyeb and Mohamed H.Basooni. Al Azhar University, Cairo, Egypt.

This study included two groups of patients. The first group consisted of 10 leprosy patients, classified into 20 patients with arthropathy and 10 patients without arthropathy. The second group - the control group - consisted of 10 age-matched patients suffering from arthritis.

It was found that the mean IgG and IgA levels were significantly higher in lepromatous patients with and without arthritis than the control group. An apparent decrease in the mean IgM level was observed in lepromatous patients.
It was observed that the mean IgG in leprotic arthropathy patients was significantly lower than the mean IgG in leprotic patients without arthritis. As regard the mean IgM and IgA levels they were significantly higher in leprotic arthropathy patients than those without arthritis.

Interleukin 1, Interleukin 2 and Interferon Production in Leprosy Patients.

J.P. Chalupsky, M.R. Tapalan, and Chaitrit Hirunpetchari.

Department of Clinical Immunology, Faculty of Associated Medical Sciences and Section of Microbiology and Immunology, Research Institute for Health Sciences, Chiang Mai University, Chiang Mai, Thailand.

Twenty three leprosy patients were studied for interleukin 1 (IL-1) production when their mononuclear cells were stimulated with LPS. More than 0.5 IU of IL-1 was produced by normal subjects. Production of interleukin 1 (IL-1) was studied in 47 leprosy patients. Mononuclear cells were stimulated with interferon (IFN). The level of IL-1 in BT/TT and normal subjects with no known contacts with leprosy was significantly lower than normal subjects when stimulated with IFN. 

The immunological profile of three generations of a family with numerous leprosy patients: A two part study. Part I

Ana Valdés-Fortale, Manuel Hernández Angulo, Ofelia González-Abreu, Jose E. Rodríguez and Alma Llop.

Instituto de Medicina Tropical "Pedro Kouri" and Hospital Antileproso de Cuba, La Habana, Cuba.

The occurrence of leprosy in a large family in a high endemic focus with a prevalence rate of 16.7/1000 inhabitants is studied. The immunological profile of this family, consisting of 11 sons and 4 daughters, 10 of which present the lepromatous form of leprosy and 1 the tuberculoid, as well as the second and third generations, is described in two parts. The second generation has two clinically defined cases of leprosy, one diagnosed as indeterminate in 1972 at the age of 3 and a 25 year old girl diagnosed as borderline lepromatous in 1976. Marriages to other leprosy patients is a common denominator in this family as well as consanguinity with marital relations to lepromatous close relatives. The first case, one of the daughters, was diagnosed in 1955 at the age of 14 and thereafter, the brothers and sisters and the mother developed the disease in a stepwise fashion. Part one of this study refers to the DTH responses to lepromin, antibody titers to M. leprae and macrophage capacity to destroy the leprosy bacillus in the "healthy" family members as compared to those of their leprosy relatives, to the results obtained in untreated and unrelated leprosy patients as well as age and sex matched healthy individuals with no known contacts with leprosy.

PO 597

OBSERVATIONS ON T-CELL SUBPOPULATIONS IN ENL REACTIONS.

K. Kalyanasundaram, M. Elangovan and V.N. Bhuta.

Central Leprosy Teaching & Research Institute, Chingleput-603001, Tamil Nadu - India.

15 cases of LL with ENL were studied for phenotypic markers OKT4, OKT8, OKT9 before and after reaction. 15 LL cases, 15 TT cases and 20 endemic controls were also included in the study. It was found that OKT2 cells were proportionally more during reaction.

The inversion of the OKT4/OKT8 ratio during ENL reaction has been observed by many investigators. The cause for the inversion is claimed to be due to the marked decrease in OKT8 surface marker. In our studies we observed that this ratio, though affected it was not reversed and the disturbance observed was due to fluctuation in the T8 phenotype marker and not due to T8.
Peripheral Helper: Suppressor Ratios and Natural Killer Cell Populations in Hansen's Disease.

Sophie M. Worobec, Kenneth D. Dauer, Arlene A. Steinfort, Pierre M. George and Virginia C. Fiedler
Chicago Regional Hansen's Disease Center, University of Illinois and Northwestern University, Chicago, U.S.A.

The purpose of this research was to study circulating T-cell subsets in individuals with Hansen's Disease. Correlations were sought based on disease type, reaction status, age and sex. Ethnically-matched controls were recruited. Peripheral blood samples were collected in heparinized tubes, then lymphocytes were separated, and stained with monoclonal antibodies for dual flow cytometry. The following combinations of fluorescein (FITC) or phycoerythrin (PE) conjugated monoclonal antibodies were used: FITC Anti-CD 2 + PE Anti-CD 8 (suppressor-cytotoxic cells), FITC Anti-CD 3 + PE Anti-CD 4 (helper-inducer cells), FITC Anti-CD 3 + PE Anti-CD 8 (helper-inducer cells) and FITC Anti-CD 4 + PE Anti-CD 2 (pan T-cells). Major findings: There was no statistically significant difference in the total number of natural killer cells or the ratios of helper/suppressor cells in controls, paucibacillary and multibacillary (BI= 3) patients. Women with multibacillary disease had higher mean values (2.49; 12 samples) than women over 40 years of age with multibacillary disease had a higher mean value (2.45; 13 samples) than women under 40 years of age with multibacillary disease. This difference is especially marked in the 20-40 year range.

This study shows that women with multibacillary Hansen's Disease differ significantly in their helper: suppressor ratios from women with no disease or paucibacillary disease. There was no statistically significant difference in the helper:suppressor ratios (mean 2.45; 13 samples) than women over 40 years of age with multibacillary disease.

Conclusion: There is an evident depletion of T cells in Hansen's Disease patients undergoing multiple drug therapy (MDT).

Changes in cellular immune responses to leprosy antigens during multiple drug therapy.
The frequency of HLA antigens in leprosy and tuberculous patients were also studied and the results revealed an association between these diseases and certain HLA antigens.
Modulation of immune deficient cells of leprosy patients by protein components of Mycobacterium leprae, leading to inactivation of phagocytosed bacteria

P. R. Mahadevan, Meenakshi Verma, Prem Robinson, Jolly Harolia and Arvindb Banerji

The Foundation for Medical Research

R.C. Thadani Marg, Worli, Bombay 18, India

In leprosy patients, Mycobacterium leprae and isolated inside the monocytes, the presentation reports our observations to demonstrate the following. The viability of K,leprae inside macrophages was demonstrated by an in vitro test and mouse foot pad growth. Immunomodulation of the test component was carried out in immunized mice and in vitro test systems using cultured peripheral blood cells especially macrophages from leprosy patients and normal healthy individuals. In normal healthy individuals, encounter with M. lepraee lead to production of superoxide and inactivation of the bacteria. This is totally lacking in lepromatous leprosy. A component of M. leprae, the killed cell wall (DCW) has been isolated and tested to be a successful immunising agent by the following criteria. a) It has been shown to activate T lymphocytes and fibroblasts. The addition of macrophages from lepromatous leprosy patients. A component of M. leprae, the killed cell wall (DCW) has been shown to activate T lymphocytes and fibroblasts. The addition of macrophages from lepromatous leprosy patients to inactivate M. leprae that could motivate immunodeficient patients to react to M. leprae, and those may be potential vaccines for leprosy.
Leptospirosis and Nutrition
E.S. Ban and Kunal Saha
Vallabhvidyapeeth Dental Institute, University of Delhi
Delhi 110 007 (India).

This study was undertaken since it was earlier suggested that undernutrition in leprosy might be due to food deprivation or poverty or due to the disease process itself. Also concurrent infectious diseases in them might also modulate their nutritional status.

In order to study the above problem, body measurements as well as assessment of daily dietary intakes were undertaken in these patients along with the evaluation of biochemical and hormonal parameters. Also incidence of coexisting bacterial, viral and helminthic infections with special reference to pulmonary tuberculosis, malaria and sexually transmitted diseases were evaluated. Our lepromatous patients often suffer from pulmonary tuberculosis, resulting in a negative nitrogen balance and in various serum micronutrient levels, which proved ultimately to be fatal.

PO 615
Preliminary Efforts at the Reconstruction of the Epidemiology of Medieval Leprosy: Hospital Revisited
Stephen H. Ellis
The University of Chicago Hospitals, Chicago, Illinois USA

Excavations at several medieval leprosaria have shown that the skeletons of those buried there have diagnostic changes of leprosy. This study centered on re-evaluation of the 122 complete skeletons excavated at Naestved, Denmark by Holler-Chrestensen (dated 1250-1550 AD). The intent was to determine the age of onset of disease, since this factor and the sex ratio of patients characterize the incidence of the disease. Description of the anterior alveolar process of the maxilla was chosen for study because the extent of destruction has been linked in Malaysian patients to duration of untreated disease and because this form of lepromatous osteitis protects from normal periodontal disease. First, the Malaysian data was subjected to statistical analysis and it was found that bone loss fit a straight line regression model with a slope of 2.4%/yr, and correlation coefficient of 0.83. Skulls from Naestved were measured directly for percent bone loss and a formula employing estimated age at death was used to estimate age of onset. Over 70% of cases indicated childhood onset. Coupled with an equal sex ratio, these findings characterize late medieval leprosy as an area of extremely high incidence. This method may have a broader application both in estimating incidence for areas where such remains have been found and in using such insight as a perspective for understanding medieval leprosy in a broader context.

PO 616
ADAPTATION OF THE ONSLEP SYSTEM TO ILEP REQUIREMENTS
Claudine Minass, Michel Lechat, Catherine de Foucauld, Tves de Kettela
Epidemiology Unit, Catholic University of Louvain, Bruxelles, Belgium.

The Omslep Recording and Reporting System for Leprosy Patients is in use in 453 countries or projects, whether in its original form or adapted to local requirements. It is simple enough to allow health service workers at all levels, even the most peripheral, to collect the necessary data for operational or epidemiological evaluation in a decision making context. It has been modified to meet the needs of monitoring multidrug therapy as well as monotherapy, and to be compatible with the reporting procedures of ILEP member-associations under the new name of IL-OMSLEP, in order to alleviate the administrative tasks at the patient level.

The three categories of leprosy patients (treated, under surveillance, under treatment) are fully integrated into the system and the micro computer software. This software requires no special knowledge of information technology. It can be used to record data on an individual and the literature available, a modest contribution to the study of the problem of leprosy seen in the context of the history of medicine.
personalized form; to update these data, to compile periodic returns from these data (ILEP B-questionnaire) as well as OLEP Statistical forms to calculate ILEP or OLEP indicators for evaluating control campaigns and to calculate other statistics, at the request of the user for more detailed studies. The Epidemiology Unit of the Catholic University of Louvain, Brussels, can assist any projects to implement an information system for leprosy control programs and to computerize it.

The OLEP booklet is available in 4 languages (English, French, Spanish, Portuguese).

PO 620

POSSIBLE ROLE OF PHLEBOTOMINE SANDFLIES IN THE TRANSMISSION OF LEPROSY.

Sreevatsa and Desikan, K.V.
Central JALMA Institute for Leprosy, Agra, India

Mode of introduction of Mycobacterium leprae into the human body being not clear, vector hypothesis gained much importance. Several arthropods existing in the leprosy endemic areas are found to harbour acid fast bacilli. Phlebotomine sandflies are one of the most commonly available arthropods found in the leprosy endemic areas, which have not been screened so far for mycobacterial infection.

Sandflies representing two genera and eight species were collected from the houses of few localities of Agra. Acid fast bacilli were seen in 4/7 of the sandflies collected from the houses of leprosy localities. Laboratory reared sandflies fed on the blood of leprosy patients showed that acid fast bacilli persist only upto eight days in sandflies. Morphologically granular and fragmented bacilli were more, compared to intact bacilli. Light and electronmicroscopy of sandflies did not reveal any cellular changes. Results of mouse foot pad harvest did not indicate multiplication of bacilli in the gut of sandflies. When reared on mouse foot pad very few bacilli were carried mechanically by the contaminated proboscis. From the study it is evident that sandflies may not be having any role in the transmission of leprosy.

PO 621

DOES LEPROSY CLING TO HOUSEHOLDS? A RETROSPECTIVE STUDY OF HOUSEHOLD CONTACTS

PO 622

AN EXPLORATORY STUDY OF MULTIPLE-CASE LEPROSY FAMILIES: A GENEOLOGICAL ANALYSIS

S.C. MUDARKAR
Centre for Social Research on Leprosy Gandhi Memorial Leprosy Foundation, Hindonagar Wardha-442 103 (INDIA).

Genealogies of twentyseve multiple-case leprosy families of two randomly selected villages of Visnunagar state, a high endemic area, of Andhra Pradesh (India) were studied in 1987. Pedigrees extending to 4-7 generations covered 1460 family members, among whom were 168 patients  122 males and 46 females.

The study was intended to compare the offsprings of consanguineous and non-consanguineous marriages in relation to occurrence of disease (i) in different generations (ii) disease of the parents (iii) among different sex (iv) by birth order and (v) acceptance/rejection of the patient.

In majority of genealogical trees, occurrence of disease was found intermittently. Continuity was observed only in 125 of the trees. Both in consanguineous and non-consanguineous types of marriages occurrence showed similar pattern when both parents were patients and higher in non-consanguineous type where neither the parent was a patient or both were healthy. Sex ratio among patients among non-consanguineous type of marriage was 2:1 whereas it was 3:1 in the case of consanguineous type. No significant relationship was found in the birth order in either types of marriages. Culturally accepted norm of consanguinity has prevailed favourably both in cases of choice of spouses (irrespective of disease) and in acceptance of patients.

PO 623

Age at onset of Leprosy among household contacts of primary cases.

Dr. E. Ananth Reddy, Dr.K. Kuleya Kiran, Dr.Kishore Molani & Dr. Purushothama Rao J.

SVAYANDA REHABILITATION HOME, KUKATPALLY HYDERABAD-500 822 ANDHRA PRADESH, INDIA.

Most reported studies on age distribution of Leprosy are based on age at the time of detection of disease and not on age at onset of the disease. Even few studies on age distribution based on age at onset, have certain limitations as information is based on statements of patients with varying degree of dependability. However, in our present study we have based our finding on actual examination of contacts, every six months and there by getting accurate information of age at onset.

831 Household Contacts of 1979 primary cases of leprosy of all classification detected by different methods by Swayanda Rehabilitation Home, hyderabrd, in its central unit during the period 1979-1985. Fresh cases detected during the survey were 259. These cases were analysed as regards to age of onset in general and in relation to type of classification and sex of primary cases. Further the study will analyse the occurrence of leprosy in different age groups by calculating age specific incidence rates of each group and make comparisons.

PO 624

PREVALENCE OF LEPROSY AMONG HOSPITALISED PATIENTS FOR MEDICAL EMERGENCIES

P. Thirumalaikolundusubramaniam, & R. Alagappan.
Dept. of Medicine, Madurai Medical College, Madurai 625 020, India.

Cases of adult acute medical emergencies admitted into the medical wards during 1982-1987 were screened for associated leprosy. Of the 1057 cerebrovascular accidents = CVA (hemorrhage, infarction and embolisation), 1307 cardiovascular diseases (Coronary Heart Disease-
'CHF' congestive heart failure - 'CHF' and hypertensive heart disease - 'HBP', gastrointestinal emergencies (Acute diarrhoeal disease - 'ADD'), 550 gastrointestinal emergencies (Hepatitis, OGD, AVH), 50 endocrine emergencies (Hypertension - 'HTN', with upper GI bleeding and Hepatic encephalopathy), 550 Respiratory emergencies (Hemoptysis, COPD, ARDS), 50 endocrine emergencies and 6800 cases with HTN; one each with CHF & CRF, and 3 with HBP; 17 with ADD, one with AVH with hepatic failure, 3 with pulmonary tuberculosis and hemoptysis; one with diabetic ketoacidosis; and 27 with suicidal poisoning. No leprosy lesions were detected in patients with PNE, OGD and AVH. Thus present study clearly denotes that the medical men should look for associated leprosy in every case when brought for checkup or with emergency medical problems.

In areas where leprosy is endemic. However, it is difficult to say at this juncture whether leprosy patients are less likely prone for these acute medical emergencies unless population based studies are made.

Immunological responsiveness to M. leprae antigen and tuberculoid vs. lepromatous leprosy. The major objectives of present study were to analyse the spatial distribution of 231 cases of leprosy between 1983 and 1985 in Northern Malawi and to evaluate associated factors affecting the outcome. A series of models are developed for a given set of variables affecting the programme implementation. The study revealed that large parts of the country are leprosy endemic zones and at least half the Indian population is exposed to the risk of infection and that particularly 30% of the new cases are children. It is estimated that there are more than 1.5 million leprosy patients in the world and nearly 4 million cases around the globe. It is also inferred that 35% of the cases are found to be below the age group of 10 years. 85% of the cases of leprosy belong to the non-infectious type of leprosy. The five states namely Tamil Nadu, Andhra Pradesh, Orissa, West Bengal and Madhyarashtra as a whole account more than 60% of the cases. The major concentration for any city. In 76 districts of the country, the incidence of leprosy is 10 per thousand.

STUDY ON OCCUPATIONAL EFFICIENCY OF MULTI DRUG THERAPY WITH A VIEW TO IDENTIFY THE FACTORS AFFECTING THE IMPLEMENTATION

The effectiveness of multi drug therapy (MDT) has been implemented in the North East District from 1987. The Community Healthservice Department of Christian Medical College, Vellore is covering nearly 2,000,000 population in North Andhra District under the national leprosy eradication programme.

At the start in 1994 January in the leprosy eradication programme - one of this department was having a total of 406 patients with a mean of 447 cases per sub centre (40 cases of 30 and 90 cases 367). At the end of 4 years the case load is 952 with a mean of 103 cases per sub centre (90 cases 31 and 80 cases 50). It was observed during the implementation of MDT in the 9 sub centres under the programme that they performed at different levels of efficiency. The following efficiency indicators were studied according to the sub centre which included the rate of intake of patients for MDT, case acceptance rate, rate of bacillary index (BI) conversion rate, rates of reporting of case, rate of release from treatment etc. The factors affecting the efficiency of implementation studied were the prevalence of leprosy at start, proportion of 30/70 cases, mean BI, positivity rate, geographical distribution of villages, no. of previous years of leprosy work in the sub-centre etc.

From the above mentioned efficiency indicators and the factors and the factors affecting the outcome a series of operational models are developed. The data is analysed with the aim of quantifying the effect of explanatory variables on performance. Differlent models are developed and the major model is presented. On the basis of these models a set of feasible operational targets for a sub-centre are developed. From the above mentioned efficiency indicators and the factors affecting the outcome a series of operational models are developed. The data is analysed with the aim of quantifying the effect of explanatory variables on performance. The factors affecting the outcome a series of operational models are developed. The data is analysed with the aim of quantifying the effect of explanatory variables on performance.
and 82.3 were found to be M and U respectively. Four contacts had anaesthetic scores clinically detected and histologically, all of them showed an atypical chronic inflammatory infiltrate, X/0 negative.

Two of these persons were M to M and one of them healed spontaneously after 3 years of follow-up. The percentage of M contacts is three times higher than that found in the control group and support the existence of active subclinical infection among them. As for the U contacts, it is probable that other immunological mechanisms are responsible for their unresponsiveness since it is very difficult to admit that they had never been exposed to the bacillus.

The prevalence rate of disability cases to multi-bacillary cases has rapidly risen from successive surveys but the ratio of pauci-bacillary to leprosy assessed at the end of each survey in 1979. There has been no decrease in the cases detected during the follow-up period 3 population surveys have been conducted and defined rural population for the past 10 years. During this period 3 population surveys have been conducted and defined rural population for the past 10 years. During this period 3 population surveys have been conducted and defined rural population for the past 10 years. During this period 3 population surveys have been conducted and defined rural population for the past 10 years. During this period 3 population surveys have been conducted and defined rural population for the past 10 years.

The characteristics of the changes in disability rates by age, sex and type are described. The importance of disability assessment as an outcome measure in leprosy control is discussed.

Wang Chengyi, Yu Guoqiu, Lu Yini, Sun Chaoshen, Hong Kejun, Liang Changquan, Tong Quan, Yong Hengliang

The patient named Wang with lepromatous leprosy whose disease of leprosy could not be controlled by a sulfone in 1975-1980 to donate his blood to the 60 donors who needed the blood for surgical operations and amputations. Eight out of 60 donors were infected by blood transfusion to develop the leprosy during the observation of 6 years. The results of the cases of leprosy were diagnosed by clinical, pathological and bacteriological examination. Eight out of 60 type of leprosy, 4 had BT type, 1 had BL type, 1 had LT type, 1 had LT type.

The patient's antihuman IgG antibody level in control populations should be studied deeply again.

The use of M. Leprae Antibody Duration for the seroepidemiological study of contacts of leprosy patients.

Contacts are those who there is a high probability of exposure to M. Leprae. Contacts are those who there is a high probability of exposure to M. Leprae. Contacts are those who there is a high probability of exposure to M. Leprae. Contacts are those who there is a high probability of exposure to M. Leprae.

Efficacy of fixed duration of multidrug therapy on paucibacillary leprosy - Clinical and histological findings.

Rach Matalai and Mary Jacob

PO 620

MULTIANTIBIOTIC THERAPY OF LEPROSY IN HONG KONG

A RENAL 425 PATIENTS TREATED BETWEEN 1977 AND 1987

Norman M. Hung and Tam Sheung Tong

Special Skin Unit (Hung's Wides)

Social Hygiene Service, Medical and Health Department, Hong Kong Government

A form of multidrug therapy with dapsone, clofazimine and rifampicin was introduced for the first time for treatement of leprosy in Hong Kong in 1977. All case records of leprosy patients have been studied and 425 patients identified who have taken multidrug theapy between 1977 and 1987. The indications for use, regimen used, clinical and bacteriological results, patient acceptability, compliance with treatment and side effects have been reviewed. The treatment was found effective and acceptable with no serious side effects and so far no patients have relapsed after multidrug therapy. An analysis of results with background information set against falling annual registrations of new cases is included.

PO 630

CLINICAL AND HISTOLOGICAL FINDINGS

PO 631

PO 632

PO 633

EFFICACY OF FIXED DURATION NOT ON PARACOCCAL LEPROSY - CLINICAL AND HISTOLOGICAL FINDINGS

Rach Matalai and Mary Jacob

Dept. of Dermatology

Christian Medical College Hospital, Vellore, India

During the 14 month period from May 1984 to July 1985, patients attending the leprosy clinic of the Christian Medical College Hospital, Vellore, India, with simple leprosy patch were screened. Children below 5 years, patients with face patches or patches less than 2.5 cm were excluded. Patients who could not come for regular follow-up were excluded. Patients were randomly assigned to two regimes of therapy: Conventional dapsone monotherapy for 6 months as per WHO recommendation for paucibacillary disease. Clinical, histological and immunological status were determined prior to initiation of therapy. Clinical and histological parameters were reassessed at 3 months. 6 months, 1 year, 2 years and 3 1/2 years.

This paper presents the findings of the study, showing the evolution of the disease through the treatment period with particular
emphasize on the status of the disease 2 1/2 years after starting treatment. Of the 17 patients who completed the study in the MT group, 4 (23%) showed no treatment response and continued to have histological evidence of active disease. These findings did not differ significantly from those treated with dapsone alone. The implication of these findings are discussed.

The implementation of MDT in Kenya 1983-1987

G.O Idukitta, M.C.J. Bosman, J.v.d. Broek
National Leprosy and Tuberculosis Control Programme(NLTP), P.O.Box 20781, Nairobi,Kenya

The extent of the leprosy problem in Kenya is discussed. Total estimated prevalence: 25.000. Of 6558 leprosy cases on register in 1984 90% live in 10 districts with a total population of 6.683.445. Prevalence 0.88/1000; incidence 8.5/100.000. Among new cases: 5% children, 9% disability grade 2+3, 22% MB.


In 1985 and 1986 1072 patients were put on MDT. (643 PB and 429 MB). Results of 392 PB cases: 8% RFT, 7% Tnc. From 203 MB cases put on MDT in 1986 and 1987 2% were declared O.O.C. so far.

The NLTP development plan 1987-1990 envisages the district-wise implementation of MDT in 4 regions with a high leprosy prevalence. The target is to have put all new and eligible old cases in 14 districts with 95% of all cases on MDT before 1-1-1990.

The Effect of Seven Years MDT in Leprosy Control Unit at Miraj,India

B Dr. P.D. Samson, S.M.Parkhe, P.H.Das and M.Goldman Richardson Leprosy Hospital,Miraj 416 410,India.

The MDT regimen was implemented in the Leprosy Control Unit,Miraj in 1982. The regimen recommended by WHO is being followed for multi bacillary and pauci bacillary cases. The program is monitored by tablet counts and urine examination. Patients are assessed clinically and bacteriologically.

The following results are observed: 98% one-patch cases showed improvement in 9 months, 95% of more than one patch cases showed improvement in 9-12 months, 75% of multi bacillary cases with high B.I. showed improvement in 30-36 months. The remaining multi bacillary cases showed improvement within 20-24 months. Two pauci bacillary refractory cases and one multi bacillary case have not shown any improvement so far.

The overall activity of the Leprosy Control Unit, such as Case Finding and Case Finding has improved. The rate of defaor and lepromatous cases has declined and the detection of one-patch and voluntary reporting has improved.
204 Paucibacillary (TB+Q) leprosy patients consisting of 156 male and 48 females, age ranging between 6-75 years old, were on MDT during the period of March 1985 to March 1987. 205 cases among them were fresh untreated patients and 15 cases has been treated with Dapsone mono-therapy less than one year. The clinical diagnosis is based according to the Ridley & Jopling Classification with the following criteria: Histopathological picture shows TT or TT type, the lepromin test is positive and the absence of AFB in all smears. The evidence of clinical symptoms, side effect of the drug and bacteriological examination were monitored during the MDT schedule and follow-up period. At the end of February 1988, 202 patients has completed the MDT within the period of 6 to 9 months. 24 patients were discharged due to irregular of attendance, 9 patients transferred to the HC, 2 patients were pregnant, 2 patients with jaundice and 11 patients discontinued their treatment before the end, but the cases were not evaluated. The last patient was examined in March 1989, 19 months after completing the MDT. The examination of histopathology, lepromin test, direct smear and routine examination of the cases in MDT group, it showed a remarkable reduction in the B.I after fixed duration therapy. Operational factors will also be discussed.

**Observation period:**
1) The initial short-term effects in both groups (2) the comparative drop in B.I. levels over a period of 36 months, (3) comparison of B.I and neuritic episodes, (4) the effect on 5 cases of pregnancy and (5) comparative relapse rates.

**PO 641**

**ESSAI Controle de Traitement de la Lepre par MONOTHERAPIE D'APRES 9 Mes Apulation**


Depuis 1982, un essai contrôlé a été lancé à Dakar pour tester l'application sur le terrain de plusieurs protocoles de polychimiothérapie de la lèpre. Pour les paucibacillaires, le protocole 9M15 a été adopté. Pour les nouveaux cas multibacillaires, un premier schéma est similaire à celui présenté par l'UNICEF d'un second après l'incorporation d'une phase initiale de 3 mois de traitement intensif. Enfin, dans les cas de récidives probablement résistantes à la DDT, la DDD quotidienne est remplacée par l'éthionamide. Près de 600 malades sont entrés dans l'essai. Les auteurs présentent pour chacun de ces schémas thérapeutiques un bilan concernant l'assiduité, la tolérance clinique, la fréquence des réactions et des névrites, et l'évolution à court terme de l'index bacteriologique. Les auteurs soulignent les difficultés du suivi des malades dans cette grande métropole Africaine et déplorent la proportion importante de malades perdus de vue après l'arrêt de la PCT.
were given to overcome the problems of regular use for MOT evaluation, while the 3rd edition was published. A "package" supply of drugs for each patient was given MDT.

Starting at the end of 1984, all cases who started free of the disease suffered from reactions and were under investigation.

Cases where biopsy from one of the cases showed a reaction due to wrong classification at the start of treatment and 161 PB cases were declared positive.

Between 1982-1987 779 PB and 491 MB cases were completed and reported. Out of the 210 cases 76 suffered from reactions; 16 from ENL & 10 from reversal type. In 8 ENL cases the condition relapsed 2 to 5 times.

A peculiar type of reaction was observed in 2 LL cases, a crop of small red tender nodules 2 to 4 or more appearing few days (2-3) after the monthly dose of Rifampicin. This was repeated 7 times in one case & 5 times in the other.

Most episodes of reactions were responsive to treatment, however, a 13 years old boy suffering from LL, died during a severe attack of ENL.

Detailed tables & colored slides will be shown, comparing the results in the 2 groups of cases studied.

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Detailed tables & colored slides will be shown, comparing the results in the 2 groups of cases studied.

PO 643

FOLLOW UP STUDY OF 210 LEPROSY CASES TREATED WITH M.D.T. IN EGYPT

Bashshy W. Moharab
Abdel Motalh Wali
Director, Daniat Skin & Lep. Clinic, MONH, Egypt.

210 Lep. cases (15) from Daniat & 75 from a clinic in Cairo) were treated by M.D.T., as advised by WHO in 1982. Cases had late reversibility as follows: 76, Border line 151, LL 51.

70 cases (34 multibacillary & 37 paucibacillary) completed the course for 2 years & were followed up for variable periods (16 cases 3-5 years). Out of the 70, 58 became clinically & bacteriologically free of the disease, 10 suffered from reactions & 2 LL cases were still smear positive.

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PO 644

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Detailed tables & colored slides will be shown, comparing the results in the 2 groups of cases studied.
These and other changes in the indicators will be presented in the form of posters of tables and graphs.

PO 647B
FIVE YEARS OF MULTIPLE DRUG THERAPY IN SIERRA LEONE - AN ANALYSIS
Manickam Rangaraj and Jacqueline Rangaraj
Leprosy Control Programme, Freetown, Sierra Leone

As on January 1988 a total number of 4,828 cases have been put on MDT, of which 4,627 are multibacillary and 391 are paucibacillary cases.

The standard regimen recommended by WHO is being followed for both paucibacillary and multibacillary cases.

The following factors are analysed:
- for paucibacillary cases
  1. percentage of cases which completed the full course of treatment
  2. time taken for lesions to become inactive
  3. follow-up ranging from 6 months to 42 months
  4. relapses and type I reaction

- for multibacillary cases
  1. clinical improvement
  2. bacteriological improvement
  3. reactions = 3% and type I reaction
  4. attendance
  5. side effects of the drugs used.

PO 646
COMPARISON OF DAILY RIFAMPICIN-LAMPRONE-DAPSONE VERSUS MONTHLY ONCE RIFAMPICIN WITH REGARD TO RAPIDITY AND RELAPSE RATES.
Sivamunath Rehabilitation Home, Kukatpally.

Among the new patients registered during 1982 and 1983 at Sivamunath Rehabilitation Home, Hyderabad, 330 patients were put on multidrug therapy. These patients were divided into two groups; and different regimens were given to them. Group A had 190 patients who received 450 mg Rifampicin daily with Lamprone 100mg on alternate days and 150 mg Dapsone daily. The monthly dose of Lamprone and Rifampicin were supervised in the second group and all drugs were administered under supervision in the first group.

These two groups were analysed after four years from start of treatment, and the results of bacterial clearance and relapse rates among them will be presented, as also the occurrence of type II reactions and side effects of the drugs will be discussed.

PO 649
STUDY OF RELAPSE AMONG 7445 CLINICALLY CURED LEPROSY PATIENTS IN BEIFANG MUNICIPALITY, WEIFANG, CHINA
Zheng Dayou et al., Municipal Institute of Dermatology, Weifang, China

In order to study leprosy relapse and factors affecting it, and thereby draw up pertinent measures to control this ailment, in 1983, all surviving cured patients were followed up by clinical and bacteriological examinations. All files and records of all such cured patients were reviewed and analysed according to a uniform standard questionnaire. The total relapse rate was 0.13% (0.09% per year), and the annual relapse rate of multibacillary leprosy patients was 0.27% (0.21% per year). Among paucibacillary patients, 0.05% relapsed per year.

The relapse rate of multibacillary leprosy patients was 0.73% (0.45% per year) and that of paucibacillary patients was 0.13% (0.07% per year). The relapses in our study were significantly lower than in similar studies from other areas. The factors possibly affecting the occurrence of leprosy relapse have been discussed.

PO 650
EVALUATION OF MULTIPLE THERAPY FOR MULTIBACILLARY LEPROSY OVER TWO YEARS IN EICHING TULLE, SICHUAN, CHINA
Hu Wei, Du Wei et al., Provincial Institute of Dermatology, Chengdu, China

In 1983-1985, in Eiching city, 151 multibacillary cases of leprosy were treated with the multidrug regimen recommended in 1982 by the World Health Organization. Seventy-two cases were treated for 24 months and 79 for 36 months. During the first year of treatment, the results show clinical improvement and decrease of average bacterial index. At the end of 24 months 32 cases were untreated, the average BI before the start of MDT was 1.50 and after 24 months of MDT the average BI was 0.82. The relapse rate of patients in the second group and all drugs were administered under supervision in the first group. The patients were divided into the following phases:

A. Preparatory Phase
1) Education to the public and different categories of health personnel.
2) Training of field workers in the three-tiered primary health system in standardised methodology and assignment of responsibilities.
3) Active case-finding, diagnosis and completion of case histories.

B. Implementation Phase
1) To ensure drug delivery and supervision (1983).
2) To check on regularity (1984).
3) To give incentives to patients with indications of leprosy and drug reactions, admission to the district general hospitals, if necessary.
4) Prevention of disabilities at early stages.

The results show that MDT may be successfully implemented in Eiching city. The control programme should be well planned and properly implemented to avoid the occurrence of multidrug resistance.
forms of leprosy, course, complications and therapeutic modalities were dealt in, and hence Siddha medical practitioners (SRP) considered the need to prescribe SM without any proven scientific value. Moreover some other skin diseases which simulate leprosy were also included. The deep rooted wrong conception for leprosy patients, to the extent that the current concepts of leprosy, may be taught to Step and incorporate them in the healthcare delivery like local dais for antenatal care and delivery. This procedure will help to identify the early cases, provide an opportunity for uniformity of therapy, and will develop the confidence of local people for eradication of leprosy. (Sponsored by TNGRC, Madras.)

PO 653

THE CLOFAZIMINE THERAPY OF SULFONE RESISTANT LEPROSY: LONG-TERM FOLLOW-UP

Robert H. Jacobsen

While monotherapy of leprosy can now no longer be recommended, between 1956 and 1978, 81 patients at Carville were placed on treatment with clofazimine monotherapy for proven or suspected infections with sulfone-resistant Mycobacterium leprae. Although many of these left Carville, died of non-clofazimine related causes, or were changed to other therapy because of side effects (usually pigmentation), some continued treatment at Carville until their disease became quiescent. All remained on clofazimine therapy after and follow-up has revealed no relapses.

Clofazimine resistance was not detected in any of these cases, and study is being developed in some of these cases and life time therapy is impractical in most control programs. However, these results suggest the possibility of using clofazimine monotherapy as an alternative to dapsone monotherapy, and resistance to clofazimine may be less common.

PO 654

ANTI LEPROSY THERAPY-RESISTANCE OF HANSEN'S BACILLI MONOTHERAPY vs. "TRIPLE THERAPY" H.A Flich and Th. Flich, Accademia Nationale de Medicina, Brest; Laboratoire G.H. Morlacs.

Several publications (mainly in USA) underline the phenomenon of sulfone resistance in M. leprae. Although widespread treatment of H.S. by mono-sulfone (D.D.S.) since April 1949 we have not stopped from drawing attention to the potential danger of sulfone resistance but we think that importance of resistance of H.S. to D.D.S. is now exaggerated. We must look to it by the use of monotherapy. It is caused by utilization of sulfone substitutes (of an unstable metabolite) and D.D.S. insufficient, irregular or prematurely interrupted treatments (leading to sulfone resistance).

Carville were placed on treatment with clofazimine monotherapy from the start. The D.D.S. "maximal-tolerated-effective-dose" was 2000mg per day, as a standard adult treatment (used with satisfaction for many years). Also little by little the adult daily dose has been reduced to 50 mg, even 10 mg(1), if it was fixed at 100 mg, but this dosage itself, is able to cause sulfone deficiency leading to resistance (Brown). Isn't it the common sense of importance to adapt the dosage of D.D.S. to individual patient's metabolic capacity? Some products can be associated now, with D.D.S.: RIFAMPICINE, CLOFAZIMINE, PROTHIAMIDE. But cases of resistance of these drugs are already published. The triple drug therapy is unfortunately quite expensive, inaccessible in most countries with high prevalence. Implementation of this therapy also raises problems in order to avoid a partial treatment of H.S. in the last stages of the disease.

PO 655

ESTUDIO DE TRATAMIENTO COMBINADO DE CORTA DURACION CONTRA LA LEPRA EN MEXICO

Dr. Francisco Castellanos Garcia.

Direccion General de Necrologia Preventiva, Secretaria de Salud, Mexico.

Antecedentes: El estudio se inicio en marzo de 1985, teniendo como antecedente que en el país se ha usado practicamente solo monoterapia sulfonica. Se trata de un ensayo clinico comparado dos esquemas con politerapia, con tres drogas, aceptados por la OMS, por espacio de dos anos, uno de ellos con fase inicial intensiva de sulfone hipermetabolico, supervisado durante tres meses; con seguimiento de los pacientes de ambos esquemas por espacio de un ano al tercero.

Objetivo: Evaluar la eficacia terapéutica y aparición de efectos secundarios comparando ambos esquemas.

Esquemas usados: OMS (A). Una dosis diaria de DDS 100 mg, y CLO 50 mg, complementada con una dosis mensual de RMP 600 mg, CLO 300 mg, durante dos anos. OMS (B). CLOFAXIMINE, PROTHIAMIDE. But

Salen los resultados en marzo de 1985, de los que ingresaron a ellos salio el 24% de esquema A y 25% de esquema B. Eficiencia terapéutica: Como era esperase, con ambos esquemas la proporción de enfermos con mejoría, conforme aumenta el tiempo de tratamiento, pero al hacer la comparación, en contramo franca superioridad del esquema B, particularmente durante los primeros tres meses de tratamiento, en proporción de 4 a 1; la relación de favor del esquema B se hace menos notorio a los 6 y 12 meses, pero permanece 2 a 1, de acuerdo al reporte personal del personal.

Las reacciones secundarias: El efecto indeseable encontrado con más frecuencia, fue la hiperglucemia, presentando en el 27% de los enfermos mayor en los que tomaron el esquema A (71%) que entre los del B (23%). Solamente una paciente presento hepatitis tomando el esquema B. Conclusiones: Por ser resultados preliminares no se realizaron pruebas de significancia estadistica, sólo se compararon los esquemas a base de relaciones y proporciones. Los resultados orientan a pensar que es más efectivo el esquema terapéutico con fase inicial intensiva de rifampicina y clofazimina para lograr evolución de lesiones y negativización baciloscópica, particularmente en los inicios. Los efectos secundarios encontrados también favorecen en la comparación al esquema B. Estos hechos en principio están en desacuerdo con la hipote-sis planteada de que el suministro diario o con tres meses de tratamiento.

Combination therapy vs. monotherapy in DL and LL patients: a prospective randomized multicenter study.

Manfred Dietlein, J. Hamburger, H. Ganapati, V. Olevantu, J. Jayakumar, T. Chiang, W.M. Meyer, and W. Guas, "Clinical Study Group, Department of Medicine, University of Tropical Medicine, Hamburg, Germany; "Leprosy Con-
post treatment biopsies were inoculated into the mouse foot pad. The effect of different chemotherapeutic regimens on bacterial viability, BI reduction, clinical improvement, the relationship between the smear BI and biopsy BI, the quantum of bacteria inoculated and the quantum harvested were investigated. A significant difference was observed between the pre and post treatment BI level. The BI reduction between the regimens was not significant. The percentage of bacteriologically negative patients after 3 year period in these regimens were not different from each other. Eighty three patients(83%) remained still BI positive at the end of the study. About 95% of the strains from bacteriologically positive patients after 3 years treatment did not multiply in the mouse foot pad indicating a uniform kill after this period. No relapses have been so far encountered. No correlation was obtained between the smear BI and biopsy BI (per mg), between the quantum of bacteria inoculated and the quantum of bacteria harvested. Significance of the results, the present criteria to assess the superiority of the regimens are discussed.

The comparative effectiveness of various regimens of intermittent therapy in leprosy. T.S. Gnanagocy, R.J. Kadaney, Leprosy Research Institute, Astrakhan, USSR.

The results of the treatment of 44 patients with active lepromatous leprosy are presented. Three regimens of intermittent therapy were studied: I (17 cases) - dimopholine (200mg) + rifampicin (300 mg) and clofazimine (100 mg) alternately; II (15 cases) - DDS (200 mg) + rifampicin (450-600 mg) and prothionamide (300mg) alternately; III (12 cases) - DDS + prothionamide (the above doses) and rifampicin in a high dose of 900-1200 mg alternately (12 cases). The drug tolerance was satisfactory without deterioration of functional state of liver, kidneys and indices of peripheral blood. Clinical, histological and bacteriological investigations confirmed the effectiveness of all three regimens of intermittent therapy. The combination of dimopholine, rifampicin and clofazimine was the most effective one: 16 out of 17 patients showed marked improvement (morphological and bacteriological indices fell on the average by 90-100% and 70-80% respectively, p<0.05). Clinical regimens was not superior over regimen I and II. Side effects in patients given high doses of rifampicin did not increase the effectiveness of intermittent therapy, nor was it superior over regimen I and II. Side effects in patients given high doses of rifampicin were more often, no regimen was better under supervised conditions and when the patients tolerate such doses in randomized intermittent therapy. The data obtained permit to recommend large-scale usage of intermittent therapy for leprosy patients.

The effect of clofazimine on the pharmacokinetics of rifampicin and dimopholine in leprosy.


The standard therapy for multi-bacillary leprosy is at least two weeks of daily Clofazimine (CIF) and Dimopholine (DDS), augmented by Rifamipicin (Rif) daily for 14 days and once a month thereafter. The purpose of this study was to examine the possible effect of CIF on the metabolism of Rif and DDS. In the first phase of this study 15 untreated leprosy patients were given Rif and DDS for 7 days and then Rif, DDS and CIF for 7 days. The concentrations of Rif and DDS were estimated in timed plasma.
specimens and in 24h urine specimens on days 7 and 14. No significant differences in the pharmacokinetics of Rif and DDS were observed between two occasions of sampling.

In the second phase of the study, after giving 100 mg DDS orally to 15 healthy volunteers, blood and urine samples were collected on the day of study from 150 LL patients on DDS 100 mg daily or DDS daily plus Clf 100 mg AD for 3 months to 5 years. All samples were analysed for DDS content. While there was a difference between plasma levels of DDS on single and multiple doses, there was no difference between two groups of patients on either DDS or DDS plus Clf for varying periods, thereby ruling out any significant effect of Clf on metabolic disposition of DDS.

The study showed that MDT can be implemented in tribal, rural and urban population with high rate of compliance.

Clinical and bacteriological evaluation of patients after suspension of treatment with MDT-drug.

Murtaza, A.B., Alvilloa, J.C., Villena, F.R. and Andrade, V.L.G.

Clinical and bacteriological evaluation of patients after suspension of treatment with MDT-drug.

VIJAY SHANKER

Clinical and bacteriological evaluation of patients after suspension of treatment with MDT-drug - the WHO recommended regimen.

Clinical and bacteriological evaluation of patients after suspension of treatment with MDT-drug.

Clinical and bacteriological evaluation of patients after suspension of treatment with MDT-drug.
In 1983 a study on MPT as recommended by O.M.S. was initiated in the Campaúti State Hospital. Up to this date, we have had one hundred and fourteen patients who completed treatment. Out of sixteen patients, all paucibacillary, were released from control. Nineteen-eight, seven-four MB and twenty-two PO are under surveillance after suspension of treatment. We have two defaulters (one MB and one PO). The clinical and bacteriological findings in two years follow up are presented and discussed.

PO 667 USE OF MODIFIED RIDLEY'S BACTERIOLOGICAL INDEX SCALE FOR BACTERIOLOGICAL ASSESSMENT OF MULTIBACILLARY CASES UNDER MULTIDRUG THERAPY.

S.N. Makh, K. Ganapati.
Acworth Leprosy Hospital Society for Research Rehabilitation and Education in Leprosy, Vadala, Bombay-400 031, India.

Ridley's bacteriological index scale is used universally to judge bacteriological assessment of multibacillary leprosy cases. The scale is based on log. 10 and thus rise in bacteriological index 1 to 2 is not the addition of one unit but it is multiplication with 10. To get the proper judgment of bacteriological quantum in human source, the modification is suggested to Ridley's scale by applying formula such as Average Bacteriological Index of the group of a patients X No. of patients in the group and scoring point based on Ridley's logarithmic Bacteriological Index Scale. This scale has applied to leprosy cases in a model field unit and multibacillary cases under the treatment of multidrug therapy. This scoring system based on arithmetic scale revealed that (a) 95% bacteriological load is harboured in leprosy cases having Bacteriological Index more than 2 and (b) The introduction of multidrug therapy initiated the reduction in total bacteriological quantum is very fast such as 100% to 5% at 12 months and 2.5% at 24 months. So to achieve leprosy control within specific period the leprosy cases having Bacteriological Index more than 2 have to be treated on priority basis.

PO 668 MULTIBACILLARY LEPROSY CAN BE TREATED BY A FIXED DURATION THERAPY. TREATMENT CAN BE STOPPED WHEN DI IS STILL POSITIVE.

Leprosy Laboratory, Institute Tropical Medicine, Antwerp, Belgium.

Since 1980 we have been applying in MB leprosy fixed duration cures in treatment regions of 52, 26, and 13 weeks, composed of rifampicin (RMP), ethionamide (ETH), dapson (DDS), clofazimine (CLO), isoniazid (INH) and PTH for the first 3 mons, together with daily DDS and RMP, either in a single initial large dose or 900 mg once weekly.—were administered for 2 yr. During this time, biopsy specimens were obtained, and the recovered M. leprae were inoculated into mice for detection of persisters. In addition, periodically, the BI and LIB was measured, patients were examined clinically and observed for side effects, and a number of laboratory tests were carried out.

Despite the widely varying strengths of the experimental regimens, no differences were demonstrated among the regimens, with respect to the frequency with which persisting M. leprae were detected, clinical response, and adverse reactions, with two exceptions. The patients treated in Chingopu with Regimen A—daily RMP, DDS and CLOF or for the first 3 mon, together with daily DDS and RMP, either in a single initial large dose or 1900 mg once weekly—were administered for 2 yr. During this time, biopsy specimens were obtained, and the recovered M. leprae were inoculated into incubate for detection of persisters. In addition, periodically, the BI and LIB was measured, patients were examined clinically and observed for side effects, and a number of laboratory tests were carried out.

PO 670 RECOGNITION OF MYCOBACTERIAL ANTIGENS BY SERA FROM LEPROSY PATIENTS.

Department of Clinical Tropical Medicine, London School of Hygiene and Tropical Medicine, London, England.

A knowledge of the antigenic composition of Mycobacteria leprae, and the role that these antigens play in the immune response during infection, are prerequisites for understanding the pathogenesis of leprosy. In order to identify antigens in 3 amoniole derived M.Leprae sonicates and a soluble extract (SE) of M.tuberculosis, those preparations have been subjected to SDS-PAGE and Western blotting using sera from leprosous patients and healthy controls. Eleven distinct antigens were recognized in the M.Leprae sonicates by IgG class antibodies in leprosy sera. Proteins of 33, 25, 15 and 12 KD were the most commonly observed and the 15 and 12 KD proteins were recognized with high intensity. The same sera recognized among others, antigens of similar molecular weight in the M.tuberculosis SE, although with less intensity and at a lower frequency. The sera samples from healthy donors did not recognize the 33, 25, 15 or 12 KD antigens in the M.Leprae sonicates. However, they did recognize a 25 KD antigen in the M.tuberculosis SE.

Using M.Leprae-specific mouse monoclonal antibodies it was demonstrated that the 33, 25 and 15 KD antigens are different from those well characterized protein components previously described (65, 36, 28, 18 and 12 KD) and already cloned.

A selection of sera samples from these lepromatos patients are being used as antibody probes in order screen the recombinant DNA library of M.Leprae expressed in E.coli.

PO 671 STIMULATION OF UNSELECTED T CELL POPULATIONS WITH PURIFIED RECOMBINANT PROTEINS OF MYCOBACTERIAL ORIGIN.

M. R. Mann, B. School and S.H.E. Kaufmann.
Dept. of Medical Microbiology and Immunology, University of Ulm, Germany.

The identification of antigens with potential value for the prevention and diagnosis of the mycobacterial diseases leprosy and tuberculosis needs to be done on the T cell level. Recently, recombinant proteins of mycobacterial origin have been expressed as fusion proteins with B-galactosidase in the Agt 11 system by R.A. Young et al (Nature 316:450, PRAS 82:2583).
Some of these r-proteins have been shown to stimulate selected long term cultured T cell lines. In contrast, freshly isolated T cells cannot be used for the characterization of the T cell antigenicity of these proteins because their responses are obscured by various E-cell components. We have therefore developed a universal purification method consisting of an anti-β-galactosidase affinity column and an anion exchanger which allows screening of mycobacterial r-fusion proteins with unselected T cells. Purified r-proteins were then used for stimulation of freshly isolated peripheral blood cells from normal donors. The r-proteins tested thus far (19 kDa, 19 kDa, 65 kDa and 71 kDa proteins of M. tuberculosis) were all capable of stimulating T cell responses while the β-galactosidase control failed to do so. Thus screening of purified r-proteins with unselected T cell populations has become possible.

IMMUNOLOGICAL SIGNIFICANCE OF MYCOBACTERIUM LEPRAE CELL WALLS.

Vijay Mehta, Johanne Melancon-Kaplan, Robert Modlin, Thomas Rizzi, Shiyi Wu, Shirley P. Brennan and Barry R. Bloom

Albert Einstein College of Medicine, Bronx, New York, USA

Both in vivo and in vitro studies suggest that resistance to M. leprae infection is mediated by T cells rather than antibodies. Thus to design new vaccines and to test rejection therapy it is necessary to test T cell responses relevant for induction of T cell responses that are likely to be important in protection against leprosy. It has long been known that the cell walls of mycobacteria can stimulate T cell responses with strong adjuvant activity. We have explored the possibility that the cell walls of M. leprae may contain important antigens for cell-mediated immunity and may therefore be useful purified cell walls of M. leprae stimulate proliferation of T cells from tuberculoid but not lepromatous leprosy patients and elicit DTH skin reactions in guinea-pigs, tuberculoid patients and controls sensitized to M. leprae. Analysis of the precursor frequency of antigen-reactive human peripheral T cells revealed that there are as many T cells reactive to antigens associated with purified cell walls as to intact M. leprae. Upon removal of mycolates and arabinogalactan, the protein-peptidoglycan complex retained all of the immunological activity, whereas, the reactivity was destroyed by protease treatment. Thus, one or more cell wall associated proteins appear to be a major contributor to DTH responses to M. leprae.

PO 673

Identification of a Major Immunostimulating Protein from M. leprae.

Multik M. Neighbours, 1,2 Malcy L. Mun*, 2 Robert H. Gehlen 2 and Edgar G. Engleman 2

1 Medical Research Institute, San Francisco, CA, USA
2 Stanford University, Stanford, CA, USA

Most patients with lepromatous leprosy (LL) have high titered antibody responses but fail to display specific cell-mediated responsiveness to M. leprae antigens. This immunologic defect is specific because cells mediate immune responses to antigens other than M. leprae are normal in these patients. Purified M. leprae antigens are essential for dissecting the cellular immune response to this bacterium. To gain information about such determinants, we initiated an effort to isolate native proteins from M. leprae. Using a relatively gentle acetonized extraction procedure, we have isolated a potent immunostimulatory protein from the pellicle fraction of sonicated M. leprae, designated MLP, with a MW of 35 KD. This protein is recognized by mouse MoAb (M30-4-1), by a polyclonal rabbit antiserum generated to MLP, and by an E. coli obtained from all patients. In contrast, neither rabbit anti-M. leprae sera nor sera from healthy controls recognized MLP. MLP stimulated T cell proliferative responses in all M. leprae reactive patients, as well as healthy individuals vaccinated with BCG. T cells from patients unresponsive to whole M. leprae failed to respond to MLP. MLP also stimulated proliferative responses in M. leprae reactive CD4+ T cell clones. These findings suggest that MLP represents a major immunostimulatory component of M. leprae. In addition to serving as a useful probe for studies of the T cell energy which characterizes some patients with lepromatous disease, this protein may ultimately serve as a component of a vaccine designed to provide protection against M. leprae infection.
It appears that this M. leprae specific antigen is present in all MPS cell types. The possible participation of DCs in antigen processing in leprosy needs further investigation.

Involvement of stress proteins in the immune response to leprosy.

Angela Mohamed, Raju Lathigra and Douglas Young

Mycobacterial and Related Pathogens Unit, Hammersmith Hospital, London, England.

Several of the protein antigens from M. leprae and M. tuberculosis which were originally identified using monoclonal antibodies have been further subjected to detailed sequence analysis and immunological characterization. An unexpected relationship between some of these antigens and proteins which are involved in cellular responses to environmental stress stimuli have been observed. The structure and function of stress proteins will be discussed in the light of their potential involvement in intracellular survival and in induction of autoimmune pathology.

PO 677

Purification of M. leprae antigens by preparative SDS-PAGE.

Madeline T.L. de Wit and Paul R. Klatser

N.H. Sweling ene Laboratory of Tropical Hygiene, Royal Tropical Institute, Meibergdreef 39, 1105 AZ Amsterdam, The Netherlands.

Purified antigens of M. leprae will enable us to identify immunologically functional epitopes. Purification of antigens from complex mixtures like sonicates by chromatographic techniques can be time consuming. We have exploited the resolving power of SDS-polyacrylamide gel electrophoresis and adjusted the technique for the purification of mycobacterial antigens. This technique is relatively simple and can be adjusted for optimal preservation of antigenic determinants. We have isolated several M. leprae antigens in this way, which showed a high degree of purity. Results will be shown of the exploitation of these antigens in functional immunological tests.

PO 678

Immunological characterization of the 36 kd antigen of M. leprae.

Paul R. Klatser and Madeline T.L. de Wit

N.H. Sweling ene Laboratory of Tropical Hygiene, Royal Tropical Institute, Meibergdreef 39, 1105 AZ Amsterdam, The Netherlands.

The 36 kd antigen of M. leprae has shown previously to play a role in the humoral and cellular immune responses of leprosy patients. We have purified this antigen from M. leprae sonicate by preparative SDS-PAGE and have used it for immunochromatographic characterization. The purified antigen appears as a single band in SDS-polyacrylamide gel electrophoresis and isoelectrofocusing and eluted as a single peak in chromatographic analysis. The antigen contains both a species-specific and cross-reactive epitopes. Different treatments of the antigen suggest it is largely protein in nature. Results will be discussed of the exploitation of the purified antigen in serological assays and other functional immunological assays.

PO 679

T-CELL EPITOPES ON THE 36K AND 65K MYCOBACTERIUM LEPRAE ANTIGENS DEFINED BY HUMAN T-CELL CLONES.


We studied the reactivity of M. leprae reactive T-cell clones from two tuberculous and two lepromatous leprosy patients towards a battery of different mycobacterial strains and purified mycobacterial antigens. Twenty percent of the clones appeared to be M. leprae specific. Twenty percent were cross-reactive with one of the three mycobacterial strains M. lepraenae, M. vaccae and M. crocodile. Thirteen percent were reactive with most but not all strains and the remaining 16% were reactive with all seventeen mycobacterial strains. All T-cell clones were tested with the 36K and 65K antigen isolated from M. leprae and with the M. leprae and M. bovis BCG 65K proteins produced in E.coli by recombinant DNA. At least three different epitopes could be defined on the 36K antigen of which one M. leprae specific. Two distinct epitopes were discerned on the 65K antigen of which one M. leprae specific and one cross-reactive. The M. leprae specific epitope on the 36K and 65K antigen may help in the development of a specific serodiagnostic test and in vaccine development.


PO 680

IMMUNE RECOGNITION OF THE 18K PROTEIN FROM MYCOBACTERIUM LEPRAE.


Dept. of Clinical Tropical Medicine, London School of Hygiene and Tropical Medicine, London, England, Marie Adalaido Leprosy Centre and Dept. of Immunology, Aga Khan University, Karachi, Pakistan.

Several genes from M. leprae have now been cloned, based on the recognition of their encoded proteins by mouse monoclonal antibodies, but the role of these proteins in immunity to leprosy is not known. We have been working with the 18Kd antigen (Young et al. 1985, Booth et al. 1988), using the technique of lymphocyte proliferation, precursor frequency analysis, T cell cloning and ELISA tests to look for recognation of this antigen by patients and contacts from Karachi, and by UK donors. UK donors did not recognize the 18Kd antigen, but leprosy sera contained antibodies to the protein. Non-specific immunity to this protein meant that the 18Kd antigen had to be purified before use in cellular assays. In addition a variable but often strong response to the B-galactosidase caused problems in cellular assays; this has been overcome by cloning the 18Kd gene to remove most of the B-galactosidase.

This antigen is now being used in the same way to assays to confirm that the 18Kd antigen is specific to M. leprae and does not cross-react with M. tuberculosis or M. bovis BCG.


PO 681

IMMUNE CONTRA-SUPPRESSOR T-CELL ACTIVITY IN HUMAN LEPROSY.


Department of Immunology, School of Medicine, University of San Luis Potosí, S.L.P., Mexico. *General Hospital Leon, Gto. Mexico. **Department of Immunology and Mycobacteriology, Instituto Nacional de la Nutrición "Salvador Zubirán", Mexico, D.F.

Immune suppressor T cells (Ts) antagonize the activity of suppressor cells. Since these leprosy patients appear to possess an abnormal suppressor T-cell activity, we decided to study the peripheral blood mononuclear cells (PBMC) from 20 leprosy patients (10 lepromatous and 10 tuberculoid) and six healthy controls regarding the percent
of CD8+, vicia villosa-adherent T lymphocytes (the putative Tcs cell subset) and expression of Ia and Tac antigens on these cells. In addition, we isolated Tcs cells and we studied their role in the in vitro proliferative response (3H-Thdr incorporation assay) of PBMC to M. leprae (ML). The role of gamma interferon (IFN) and interleukin 2 (IL-2) on the Tcs cell activity was also assessed.

We found that LL patients have a similar number of Tcs cells compared to TT patients or controls. However, the expression of Ia antigens was lower in LL compared to TT patients or controls (p < 0.05). In LL patients, the addition of an excess of mitomycin C-treated Tcs cells to autologous PBMC + ML cultures, increased significantly the proliferative response to ML. The pre-incubation of CD8+, vicia villosa-adherent T lymphocytes (the putative Tcs cell subset) and expression of Ia and Tac antigens on these cells. In TT patients or controls, the addition of Tcs cells previously cultured with M. leprae failed to produce any noticeable effect on the 3H-Thdr incorporation of PBMC + ML cultures.

Our data suggest that the in vitro immune response to M. leprae can be modified in some LL patients by manipulating the Tcs cells. The role of CS activity on the LL vs. TT immune response to ML remains to be determined.

A ROLE FOR HLA-DO MOLECULES IN THE M. LEPRAE SPECIFIC SUPPRESSION OBSERVED IN LEPROMATOUS LEPROSY?

Li Shuguang, Ronde de Vries
Dept. of Immunohematology and Blood Bank, University Hospital Leiden, The Netherlands.

HLA-DOwl was found to be associated with LL in several populations (Van Eden and de Vries, Lepr. Rev. 55: 89, 1984; de Vries et al., 1984 Histocompatibility Test. 3rd ed., p. 362; Serrajens, D.R. Unpubl. Rev. 70: 89, 1985). It has been suggested by Sasaoki and co-workers, that this and similar associations might be due to DOwl being the product of an immune suppressor gene (Nature 372: 426, 1987). In order to test this hypothesis we added the anti-DO monoclonal antibody 7F3-13, to PBMC of fifteen LL patients, which were all non-responsive to M. leprae. In one out of these 15 cases the response to M. leprae was restored. The results indicate that in a small minority of LL patients the HLA-DOwl molecule is involved in inducing M. leprae specific suppression. It means unlikely however that this observation can explain the association between DOwl and LL leprosy.
Extravasation of Mycobacterium leprae antigens and Modulation of Class II HLA Antigens on Human Monocytes.

Harish, K.V.* Prasad, H.K. and Indira Nath. Department of Pathology*, Biotechnology Laboratory, All India Institute of Medical Sciences, New Delhi, India.

Display of antigenic determinants in association with Class II MHC molecule on the surface of monocytes has been considered to be critical in the generation of T cell mediated response. M. leprae is an intracellular pathogen naturally residing in HU monocytes. Therefore, we monitored the expression of M. leprae derived antigens in cultivated monocytes using indirect immunofluorescence/western blot techniques. Thirteen LL-W, seven TT-ST and three healthy controls were included in the study. A panel of murine monoclonal antibodies (Mabs) specific for phenolic glycolipid (PGL), protein and polysaccharide antigens (kindly supplied by Drs. Young and Ivanyi) were used. Monocytes maintained on coverslips with or without M. leprae(killed/fixed) were fixed and used for staining with Mabs. The following observations were made: 1) Display of PGL and protein antigens were observed within 24 hrs following phagocytosis of M. leprae. 2) The staining pattern varied with different Mabs. MAb10 and MAb30 showed both cytoplasmic and membrane staining, while MAb13 showed exclusively membrane staining. 3) In the uninfected HU monocytes were positive for the expression of M. leprae antigens. 4) The expression of M. leprae antigens on monocytes was found to be similar following infection in all groups of patients. However, preliminary experiments showed down regulation of class II MHC antigen in HU monocytes, while its expression was unaltered in TT's and normals. Results indicate that HU monocytes are capable of processing and expression of protein, lipid and polysaccharide antigens of M. leprae but simultaneously expression of class II molecule appears to be impaired.

PO 508

ESTUDIO DE LA CITOTOXICIDAD DE MACROFAGOS EN PACIENTES CON LEPRA LEPROMATOSA DE PRODUCCION RA-IL-2

Dr. Manuel R. González Moraña, Dr. Sergio Garces Gollidra, Dr. Feliciana Roman García, Dr. Valentín Martín Cordera, Dr. Jose Carlos Martínez. Instituto Lepidologico de Trillos Junta de C. de Castilla La Mancha. Departamento de Medicina (Universidad de Alcalá de Henares). Centro de Biología Molecular. Universidad Autónoma de Madrid.

La susceptibilidad a la infección por el M. lepra, es un resultado de un defecto de la inmunidad mediada por células. En este estudio nuestro equipo de trabajo ha estudiado un grupo de enfermos de lepra lepromatosa procedentes del Instituto Lepidologico de Trillos, de los cuales se obtuvieron células mononucleares de sangre periférica, previamente heparinizadas y aisladas de los macrófagos por adherencia al plástico, tras lo cual mediante técnicas inmunológicas habituales se testó la capacidad citotóxica de los macrófagos lepromatosos y de macrófagos del mismo número de sujetos control, en presencia de IL-2, la cual tiene como funciones fundamentales las iniciar la proliferación de células T antígeno-dependientes de la diana, la activación de linfocitos citotóxicos, y activar linfocitos citotóxicos, pero que aquí mostró también un efecto paracícico sobre los macrófagos. Nuestros resultados muestran que hay:

1.- Un aumento de la citotoxicidad de los macrófagos lepromáticos y de los macrofagos control.
2.- Un aumento de la citotoxicidad de los macrofagos control

Ruptura de la capacidad citotóxica de los macrofagos lepromáticos.

Conclusión en que, aunque recientes estudios experimentales de diversos autores sugieren que los macrófagos en lepra lepromatosa son competentes, hay una marcada diferencia en la capacidad citotóxica de estos macrófagos y macrofagos control. Consideramos que esta información puede tener relevancia para entender tanto los mecanismos microbicidas como la inmunopatología de este proceso infeccioso.

Type I (downgrading) reaction occurring in histid leprosy

Virendera M. Sehgal, Ekvind K. Dirivastava and Vinay K. Sharma, Department of Dermatology and Venereology and Microbiology, Maulana Azad Medical College, New Delhi, India.

Abstract: A 25 year-old female reported with asymptomatic, multiple painless nodules over the wack and face, which continued to evolve over the past 8 months. Examination of the skin surface revealed multiple, translucent, submucous, non-tender, firm papules, nodules and plaques erupting out from an apparently normal skin. They were mobile and were distributed over the face, neck and lower abdomen. Twenty days following the multidrug therapy, she had moderate fever, and irregular erythematous, painful, raised patches on the trunk, face, buttocks and thighs. The lesions were otherwise well-circumscribed, yet aerated. The surface of the lesions was eurythematous or tender to pressure. Numerous small plaques were also seen in their vicinity. However, thickening and/or tenderness of the plaques was conspicuously absent.
STRUCTURES THROWING FURTHER INSIGHT INTO LIFE CYCLE OF M. LEPRAE.

V. N. Bhatia,
Central Leprosy Teaching and Research Institute Chengalpattu-603 001, Tamil Nadu - India.

Certain interesting structures have been noticed in smears from preserved lepromatous biopsies suspensions. These include filaments with branching, conidial structures and membrane-like structures showing acid bacilli. The filaments showed round empty or pink stained areas in Ziehl Nelsons stained smears. On comparing suspensions in Hanks BSS incubated at 37°C, 30°C, 10°C and -20°C; the proliferation of filaments appeared to be favoured by cooler temperatures. Such tubes showed a net of long thin branching and growing filaments. These filaments showed pink dots within them in acid fast staining. Proliferation of filaments was associated with appearance of acid fast bacilli in bunches within the membranous structures. The acid fast bacilli were also seen in relation to filaments. The morphology of acid fast bacilli was same as that of M. leprae. The above findings and other relevant observations made at this Institute will be presented.

TO04

THE USE OF A NEW TYPE OF CELLULOSE GRAFT IN THE TREATMENT OF LEPROSY ULCERS.

Domingos Quintella De Paola, Curupaiti State Hospital, Rio de Janeiro, Brazil.

The author presents a critical analysis on the utilization of "BIOFILL" (a new type of cellulose graft) in lower extremities ulcers of leprosy patients, in comparison with the results got with the application of daily dressings of zinc oxide.

It is presented, also, the period of wound healing of each kind of treatment and the criteria of establishment for the eventual need of skin graft. This judgement was made after 90 days of the proposed treatment. A comparison was performed between both operational costs. The use of "BIOFILL" shows that the patient does not need daily care or hospitalization, and is able to maintain his usual activities under ambulatorial control.

TO05

A STUDY ON THE ACTION OF AN OIL BASED HERBAL PREPARATION ON WASTING OF MUSCLES.

Datta R N, Sinha K, Mandal A and Sau G P.
District Hospital, Purulia, West Bengal, India.

Wasting of muscles is a common phenomenon in this hyperendemic zone, thus aggravating deformity and disability. An oil based herbal preparation was used as massage as part of the physiotherapy on 125 patients. Specific instructions were given along with demonstration regarding its use which was to be done regularly once daily. Definite improvement was observed within one month. Appreciable strength was regained within three months. The girth of the muscles were increased along with power by six months depending upon the degree and chronicity of the illness. 100% improvement was observed in 12% cases and no improvement was observed in 8% cases only. Details were studied and data analysed.

TO06

TREATMENT OF LEG ULCERS WITH OMIDOM PERMEABLE POLYURETHANE MEMBRANE.

A. Leviatan, Israel

TO07

THE USE OF A NEW TYPE OF CELLULOSE GRAFT IN THE TREATMENT OF LEPROSY ULCERS.

DOMINGOS QUINTELLA DE PAOLA, Curupaiti State Hospital, Rio de Janeiro, Brazil.

The author presents a critical analysis on the utilization of "BIOFILL" (a new type of cellu losate graft) in lower extremities ulcers of leprosy patients, in comparison with the results got with the application of daily dressings of zinc oxide.

It is presented, also, the period of wound healing of each kind of treatment and the criteria of establishment for the eventual need of skin graft. This judgement was made after 90 days of the proposed treatment. A comparison was performed between both operational costs. The use of "BIOFILL" shows that the patient does not need daily care or hospitalization, and is able to maintain his usual activities under ambulatorial control.

TO08

CELLULOSE GRAFT - A NEW BIOLOGICAL DRESSING FOR IMPROVEMENT OF THE BED RECEPTOR FOR SKIN GRAFTING.

DOMINGOS QUINTELLA DE PAOLA and MARIO G. P.
Fires de Souza, Curupaiti State Hospital, Rio de Janeiro, Brazil.

It is presented a case of giant and infected basal cell carcinoma from external region submitted to surgical resection and receiving "BIOFILL" (a new type of cellulose graft) before skin grafting.

It is proposed the use of "BIOFILL" after infected tumor removal and other conditions ( leg sores, etc ) when local conditions are not adequate to desirable reconstruction.

TO09

INOCULATION LEPROSY FOLLOWING TATTOOING ( TWO CASE REPORTS )

A. Leviatan, Israel

TO10

TREATMENT OF LEG ULCERS WITH OMIDOM PERMEABLE POLYURETHANE MEMBRANE.

A. Leviatan, Israel
Two female patients in whom tuberculous Hainsens developed at the site of tattooing are reported. Tattooing is very common in several parts of India and is usually done by using dirty, unsterile needles. It may be an important mode of spread of leprosy in places, where leprosy is endemic and tattooing is common.

ON THE HISTORY OF THE LEPROSY CLINIC AT THE HOSPITAL OF ALBERT SCHWEITZER AND AT TAMARANEE FROM 1924 TILL 1986

Dr. Solis-Francisco Milonchey, Union of Scientific Workers, Scientific Worker, Anton Cecher Street, 9, Bl.86(M), Sofia 111, Bulgaria

Our study of the literature available in different languages has found the articles, monographs, papers, or other publications dealing directly with Dr. Schweitzer's activity against leprosy and also with his leprosy clinic. On account of that of special value in the information provided by G. Gitting, who was a personal friend of Dr. Schweitzer, and by Miss All Silver, his tireless co-worker over the 1967-69 period.

The present paper fills a gap and is the first contribution to the history of the grundige health service work of that unique humanitarian and is a new and positive addition to his biography. Through the presentation of statistics and other facts and conclusions the paper shows beyond doubt the colossal dimensions of self-murica for one fellow-humanities and the boundless love and loyalty of the hospital staff - the European and the Negro auxiliary staff. In that respect special gratitude is due to Dr. Takahasi, Dr. Trench, and others.

Full thickness nasal tissue loss in Leprosy.

T.K. Palavgiy and S. Durair
Central JAI Institute for Leprosy, Aga Khan University, Alogar Noll Road, SADRIA, India.

The loss of full thickness of nasal wall is not an uncommon problem. The nostril and nasal discharges in multibacillary cases provide a favourable breeding ground to the flies. When larvae hatch out intense inflammation of nasal tissues occur. The larvae eat off the nasal tissue before reaching to the nasal sinuses. Sometimes the destruction of tissues is so extensive that it defiles the skin. Twelve patients have been reported here with such deformities. The methods of reconstructions and the problems encountered are discussed in detail with a yard on the treatment of such deformities.

OESOPHAGEAL CARCINOMA IN LEPROMATOUS LEPROSY

S. Premalatha and T.P. Alagapanthan
Department of Dermatology and Leprosy, Stanley Medical College and Govt. Stanley Hospital, Madras, INDIA.
A 47-year-old Indian male suffering from lepromatous leprosy taking treatment for about 20 years, has attended the leprosy clinic for the complaint of difficulty in swallowing of 6 months duration. Barium swallow studies showed entry of barium into the trachea suggestive of an obstruction in the oesophagus and tracheo-bronchial fistula. Endoscopic study showed a proliferative growth in the oesophagus obstructing the lumen. Histopathological features of the growth were in favour of squamous cell carcinoma. Radiotherapy was given after performing a feeding gastrostomy. The decreased CMI may be responsible for an increased incidence of malignancy in lepromatous leprosy. Though squamous cell carcinoma arising from chronic ulcers of leg and foot has been reported frequently in literature, the incidence of cancer oesophagus is very rare and hence this case was recorded and reported.

CONCEPTS OF LEPROSY IN SOUTH INDIA

Hanne M. de Bruin
University of Leiden
Department of Indology
Witte Singel 25
2311 SG Leiden
The Netherlands

Underlying what are usually assumed to be the 'traditional concepts' of leprosy in South India (e.g. leprosy is a curse of God), other notions about the disease also play a role. These notions should be interpreted within the cultural framework of South Indian Hindu society. On the basis of data collected from unconventional sources such as Sanskrit and Tamil mythology, popular Tamil writing and film, as well as from informants, a hypothetic concept of leprosy will be discussed. It will be argued that the association of leprosy with cultural taboos, esp. that of sexuality, accounts for a great deal of the continuing stigma. A practical implication, following from the association of leprosy with these taboos is, that the effectiveness of the health education could be improved when a more indirect approach is used. Preliminary results of an experiment in which traditional Tamil streettheatre was used to convey information about leprosy, suggest that traditional media can serve as excellent vehicles for transferring health education messages in an indirect way, that is understandable and acceptable for and appealing to a large rural public.

LEPROSY AND HUMAN DIGNITY
M. Gruner
AHM Leprosy Relief Organization Munich e.V., Munich, Federal Republic of Germany

The AHM Leprosy Relief Organization Munich e.V. has two aims:
1. to collect donations for those suffering from leprosy;
2. to free leprosy from its social stigma.
AHM has created a leprosy emblem which stands for the 3 distinct strategies of its leprosy campaign:
- to promote interest among healthy people in leprosy;
- to enable leprosy sufferers to receive confidential help and medical treatment;
- to support helpers who have devoted their lives to leprosy work.
For over 10 years AHM has concerned itself with the following:
- Leprosy Health Education programmes aimed at attracting young people in campaigns to prevent leprosy victims becoming outcasts in society.
- AHM's work is based on sociological research in the following areas:
  I) the phenomenon of leprosy in medieval Europe;
  II) present day projects of reintegration for leprosy victims;
- Developing strategies in cooperation with MEBF to combat leprosy in India.
Physical relief and a humane existence for those afflicted with leprosy will only be achieved as a result of the joint efforts of donor organizations and organizations directly involved in field work. AHM has members in countries throughout the world. In cooperation with WHO and WHO, AHM continues to work for the human dignity of those suffering from leprosy.

COMPREHENSIVE HEALTH PROGRAMME FOR EFFECTIVE CONTROL AND ERADICATION OF LEPROSY
M.C. VAIDYA
DEPTT. OF ANATOMY
ALL INDIA INSTITUTE OF MEDICAL SCIENCES
NEW DELHI, INDIA

Leprosy control (LC) and eradication projects are catching up fast all over the globe to achieve the proposed goal of IEP by 2000 A.D. Yet the plans are not yielding expected results. Often there are reports of increase of new cases or no diminishing of their numbers in many pockets. It may be attributed to the consideration that the LC programmes get in 'absolute isolation'. It is, therefore, planned to have the control programme intertwined and co-ordinated with other health projects. A comprehensive programme including the community co-operative participation has been planned. It is recently being introduced in a small pocket in Maharashtra State of India. The programme is presented for discussion.