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A REVIEW OF THE PRESENT TREATMENT OF LEPROSY IN THE LEPROSY INSTITUTIONS OF THE U.S.S.R.¹

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The Communist Party and the Soviet Government take exceptional care of the health of the workers. The Soviet authorities have achieved remarkable progress in the treatment of a great many diseases, including some which had hitherto been thought incurable or extremely difficult to cure. The continuous development of our chemico-pharmaceutical industry has produced the most modern synthetic preparations which have been used in the treatment of many infectious diseases. New perspectives have been opened up: we can look forward to the complete elimination of a host of infectious diseases. Leprosy has ceased to be a sad exception to the general rule.

The organization of leprosy treatment and research in prerevolutionary Russia, being solely dependent on voluntary contributions, can of course in no way compare with the state-organized system created by the Soviet health authorities. This is reflected in the statistics for the disease and in the very character of its development.

Leprosy is a complicated and multiform disease, but doctors do not always realize the burden and dimension of the infection which it brings to the human body. The integument and the mucous membrane are affected first, and to the greatest degree.

At the end of 1950, in all the leprosy institutions of the U.S.S.R., 48 per cent of the cases—almost one-half, that is—were suffering from ulcers of the skin, while 38 per cent had mucosa lesions—the latter, comparatively, in particularly serious cases. These lesions led to nasal deformity, constriction of the glottis, aphonia and asphyxia, and to avert the last tracheotomy had to be performed. According to the statistics of the Leprosy Institute, 2 per cent of all patients in the leprosarria required tracheotomy each year.

¹ Reprinted from the *Sbornik Nauchnykh Rabot po Lepre* (Astrakhan) **2** (1957) 3-15. Translation arranged and supervised by Dr. James Ross Innes.

Even in the very early stages of tuberculoid and indeterminate leprosy (in the lepromatous type they occur later) neurological symptoms appear in the form of specific polyneuritis with all its inherent characteristics: anesthesia, atrophy, contracture of the fingers, paresis of the feet and other manifestations. Parallel with this involvement of the peripheral nervous system, osseous lesions are also observed. Such lesions are most marked in the outermost parts of the upper and lower extremities. Dystrophic and inflammatory developments lead to orthopedic deformities and to considerable decline in the efficiency of the motor system.

Of the total number of patients in the Leprosy Institute in October 1955, 24 per cent were suffering severely from contractures, mutilations, and perforating foot ulcers, not counting those with less marked lesions of the basic motor system. The lesions of the basic motor system are one of the frequent causes of complete invalidism in leprosy patients.

Ocular lesions occur frequently, for the most part in the early stages of leprosy. Thus, according to the 1953 statistics from the leprosaria, 32 per cent had partial and 7.2 per cent complete ocular lesions, 39.2 per cent in all. In the Abinsk and Tersk leprosaria on January 1, 1954, 12 to 13 per cent of the patients were blind in both eyes, and in the Upper Kubansk leprosarium the figure was as high as 24 per cent.

Infections of other organs and systems occur more rarely, but the progressive development of the disease may often have serious effects. Functional disturbances of the liver and kidneys appear at a comparatively early stage. Kidney affection takes the form of chronic lipid and subsequently of amyloid-lipoid nephrosis. Affection of the liver usually takes the form of chronic leptotic hepatitis. In cases with a long history where there is amyloid degeneration of the kidneys there is usually degeneration of other organs: liver, suprarenals, spleen, stomach, intestines; and the usual result is the death of the patient.

Leprosy affects the endocrine system, for the most part in the form of functional disturbance of the endocrine glands. The most marked effects occur in the lepromatous type. The most important of these functional changes concern the anterior lobe of the hypophysis, the sex glands, the suprarenals, and the thyroids. Infantilism, sterility and gynecomastia occur quite frequently, especially in lepromatous cases.

The widespread infection of the skin, mucous membranes, peripheral nervous system, bones, eyes and visceral organs indicates the serious nature of the disease and the complicated treatment it requires.

The persistent attempts of many research workers down through the centuries to find a cure for the disease remained unsuccessful. At the end of the last century hydnocarpus oil began to be used for the treatment of leprosy. Unlike all the other vegetable oils, this oil con-

tains unsaturated fatty acids with cyclic molecule construction; this property had a beneficial effect on the organism of the leprosy patient.

In spite of its comparatively modest and in many cases frankly problematic therapeutic effect on the patient, chaulmoogra oil long enjoyed the reputation of being the only remedy for leprosy. It is only in quite recent times, beginning in 1943, that it started to be replaced by synthetic preparations of the sulfone group of drugs.

The basic sulfone is 4-4'-diaminodiphenyl sulfone, synthesized in 1908. Its antibacterial properties have long been known, but because of its toxic nature its use was at first restricted to veterinary medicine. In 1939, attention was paid for the first time to its antituberculosis properties, and in 1941 the sulfone drugs—like many other antituberculosis drugs—were tried out on leprosy cases. The use of these preparations (DDS and Sulphetrone) began in all the leprosy institutions of the U.S.S.R. in the second half of 1951.

These preparations of the sulfone type have a considerable effect on the leprosy process; they stay the development of the disease in both its initial and its more advanced stages. At the present time they are considered to be the best and most effective remedy for leprosy.

The use of sulfones cures lesions of the oral mucous membranes and the nasopharynx, leads to improvement of lesions of the skin, decreases the number of bacilli in the body, and in some cases—as yet small in number—leads after long application to the complete disappearance of bacilli from the active lesions.

The concomitant effects of sulfone treatment must be taken into account. Of these effects, anemia and general weakness should be mentioned first of all. To eliminate anemia, systematic treatment with blood restoratives is recommended (glandular, liver and vitamin preparations). Stomach and intestinal disturbance, hepatitis, and toxic dermatitis also occur.

Treatment by sulfone preparations may cause some exacerbation of the leprosy process, but only to a moderate degree, and in the majority of cases this is not an obstacle to the continuance of treatment. In cases of severe reaction, sulfone treatment has to be discontinued and antiallergy remedies used.

Besides the sulfones, other preparations have been used in recent years. The one most frequently used is Tibione (thiosemicarbazone). The experience of the Leprosy Institute and other leprosy institutions has shown that Tibione is an active remedy in leprosy of both the lepromatous and tuberculoid types. Tibione has been used successfully in the Leprosy Institute and in the Kazakh, Irkutsk, Tersk, Uzbek, Turkmen and several other leproseries. Rudchenko and others consider that Tibione, used in conjunction with hydnocarpus oil, is the most effective medication for the treatment of the tuberculoid type of leprosy.

On the other hand, sulfone treatment in combination with hydnocarpus oil gave worse results than when sulfone was used alone, according to reports from the Abinsk leprosarium and the Zagor clinic reports a greater frequency of complications when this method is used. Khoblya, of the Kazakh leprosarium, however, finds this treatment more effective than sulfone alone.

At the present time, sulfone preparations are the basic means of leprosy treatment, but it must be admitted that the results which they produce are not entirely satisfactory. In the majority of cases, after regression of clinical symptoms the lepromin reaction remains negative, and this indicates the possibility of a return of the disease. The search for methods of raising the resistance of the body to leprosy infection by vaccination is therefore fully justified and research is being carried out by Makismova at the Rostov clinical experimental leprosarium and has been begun at the Leprosy Institute in conjunction with leprosy section of the Central Committee of the Medical Institute. By means of the Stefansky vaccine the Rostov clinical experimental leprosarium has achieved transformation of a negative lepromin reaction to a positive one, which promotes clinical recovery.

Vorob'eva and Naumova at the Leprosy Institute have carried out treatment tests on patients with suspected leprosy with material supplied by the Astrakhan prophylactorium. The results of this treatment were positive.

As unspecific auxiliary remedies in the treatment of leprosy, Soviet leprologists have used the biostimulants invented by Pilatov, and Gubarev's preparations of oxydiphtherine acid. The grafting of vegetable and animal tissue and also the introduction of extracts during the course of treatment gave positive results in a considerable number of cases. Strength and cheerfulness increased, in certain cases of neuritis pains died away, and there was an increase in the strength of the muscles and the movement capacity of the joints. Treatment with biostimulants in the broad sense of the term has been carried out in the Abinsk, Ukraine, Tersk, Kazakh, Irkutsk and Turkmen leprosaria, and also in the Leprosy Institute. In the report of the Ukrainian leprosarium for 1953 we read:

"Of those patients treated with sulfone preparations alone there was improvement in 52% of cases, whereas 92% of those treated with sulfone preparations in conjunction with tissue therapy showed improvement."

Perineural and endoneural injections of oxydiphtherine acid, and especially its gamma fraction, kill the pain in acute and subacute neuritis if the condition is not accompanied by general exacerbation.

Among the many synthetic preparations produced by our chemical and pharmaceutical industry, much use has been made in recent years of phthivazid, which is isonicotinoyl-3-methoxy-4-hydroxybenzal, and which has a beneficial effect on the lepromatous process complicated by

active tuberculosis. The beneficial effect of pthivazid on the tuberculous process is accompanied by a notable improvement in the leprosy. This is mentioned in the reports of the Leprosy Institute and of the Kazakh and Abinsk leprosaria. The Irkutsk leprosarium obtained good results with pthivazid in cases with a long history of aggravated leprosy.

Of the other substances used recently in the Soviet leprosaria, the following should be mentioned:

1. Tubazid—a hydrazide of isonicotinic acid—was used in the Leprosy Institute and the Zagor clinic without positive results. It leads to aggravation of the disease.

2. PASK, biolan, misol, misolan, peloidin, tezan, BTS, VTS, Sheh-58 VNIKhFI, chlorosulphone-214, the antireticular cytotoxic serum of the academician Bogomolets—these were tried in many leprosaria, PASK the most thoroughly. These preparations, however, failed to have any positive effect and some of them even led to worsening of the leprosy condition.

3. Leprol with “tissulin,” prepared by Zholkevich, was tried in the Leprosy Institute (6 patients) and in the Zagor leprosy clinic (9 patients). In some cases the preparation produced a temporary improvement, but this was followed by a worsening of the condition of the patients.

4. Dorokhov’s antiseptic-stimulant was tried out in the Zagor clinic and the Latvian leprosarium, but without positive results.

5. Gordeev’s fluid used locally was tried in the Baku leprosarium, and antem (a preparation for the treatment of external ulcers) was used in the Latvian leprosarium, but the results with both were negative.

6. Gramisidin was tried out in the Abinsk leprosarium, in the Zagor clinic, and in the Kara-Kalpak and Astrakhan leprosaria. It eliminated secondary infections but had no further effect.

Apart from those substances used to act specifically on the causal organism, great importance is attached to the treatment of those organs and systems affected during the course of the disease. Specific therapy, far from excluding the use of nonspecific therapy, makes it on the contrary wholly necessary. I. P. Pavlov, in his work “Experimental therapy as a new and fruitful method of physiological research,” brings out in particular the importance of the therapy of bacterial infections.

During the course of leprosy there may occur reactions, acute and subacute neuritis, inflammation and plastic changes in the eye tissues, changes in the mucous membranes of the upper respiratory tract, functional disturbances, and disturbance of the basic motor system.

The treatment of the reactions of leprosy has seen many substantial changes in recent years. Apart from all the well known antiallergy drugs—calcium chloride, magnesium sulfate, sodium hyposulfite, potassium antimony tartrate, urotropin—antibiotics and hormone preparations are also used—penicillin, testosterone-propionate, adrenocorticotrophic hormone, cortisone and insulin.

A great deal of attention needs to be paid to cases of acute and sub-acute neuritis in which there are severe pains, destroying the patient's equilibrium. It is not easy to eliminate the pain symptom. The following are used to do this: the whole range of the novocaine group, an internal infusion of 0.5-1 per cent novocaine, salicylic preparations, and pyramidon; in some areas treatment is given with hot compresses. Studies by Verbina at the Leprosy Institute show that a good method of getting rid of the pain in leprotic neuritis is perineural injection of the gamma of oxydiphtherine acid. For the treatment of reaction and the elimination of neuritic pain the Leprosy Institute and the Kazakh leprosarium have used drug-induced sleep with positive results, although the effect was not always lasting.

Ulcerous conditions of the skin, arising as a result of breaking down of infiltrates and often having a long, torpid history, are healed comparatively quickly when treated with present-day synthetic drugs. However, neither the sulfones nor the thiosemicarbazones have a positive effect on the trophic perforating ulcers.

For the treatment of trophic ulcers of the soles of the feet (unless these are connected with bone changes—leprous osteomyelitis), Berentsev suggests a thick plaster of paris bandage. This has been used in the Leprosy Institute and in the Tadzhik leprosarium. The ease which a plaster binding gives to the extremity leads to a healing of the ulcer which is quite often permanent. After healing obtained in this way, treatment may be followed up by prescribing suitable prosthetic footwear. As with trophic ulcers, so in the treatment of leprotic osteomyelitis we are restricted to palliative measures. The surgical removal of infected bones is as yet the only way of relieving the suffering of the patient.

The treatment of eye infection in leprosaria has been as follows: To decrease a painful syndrome use has been made of salicylic preparations and infusions of 0.25 per cent novocaine. Sometimes it is necessary to have recourse to narcotics. Surgery as a means of stopping the growth of infection in the eye tissues has not given positive results. In cases where leprous development has stopped, iridectomy has to a certain extent restored the affected functions of the eye.

Although the use of the new synthetic preparations prevents the occurrence of serious ocular complications, which in the past led to such frequent and serious consequences, nevertheless account must be taken, firstly, of those patients unable to take sulfone treatment, and, secondly,

of those patients with complications. Sulfone preparations may sometimes cause aggravation in the ocular tissues. At the first sign of the most insignificant clinical symptoms of aggravation, measures must be taken quickly to effect their disappearance. Iritis and iridocyclitis produced by sulfone treatment have been successfully reduced following 5-10 injections of the patient's own blood.

At the present time specific lesions of the mucous membranes quickly respond to treatment with sulfones. In cases of large cicatricial lesions of the laryngeal mucous membrane, and serious cases of stenosis, tracheotomy is performed.

Some restricted use has been made of physiotherapeutic methods of treatment: ultra-violet rays, electro-treatment, UVCh, and paraffin therapy. These are valuable auxiliary measures and are used in resolving large, compact infiltrates on the extremities, in kidney pains of leprotic neuritis, and in trophic and perspiration disturbances. Orthopedic treatment was begun for the first time in the Leprosy Institute in 1951, in the form of physiotherapy, occupational therapy, massage, corrective splints, orthopedic footwear, etc. Positive results were obtained in 80 per cent of cases. This type of therapy should come into widespread use in leprosy institutions because, in the present state of development of treatment methods, it is extremely useful for developing contractures and deformities.

To review present-day agents and methods of treatment in the leprosy institutions of the U.S.S.R. is to see how great the changes have been in this field by comparison with the recent past, when treatment was confined almost exclusively to the use of hydnocarpus oil. Soviet leprologists have found that the best and most effective measure is combined, long-term treatment, even though it be intermittent. Leprosy treatment today is a complex affair, for only in this way can it be hoped to achieve success. An analysis of the results of treatment in the different leprosaria and in all the leprosy institutions of the U.S.S.R. testifies to obvious successes in this field.

Of all the patients registered at the Leprosy Institute up to October 1955, 48 per cent have been discharged to outpatient treatment. These patients were without active manifestations of the disease; bacilli were not found in scrapings of the nasal mucosa, or in tissue juice from places with previous lesions, or in the lymphatic glands; and no traces of activity were found in sections of biopsy specimens from the skin. Of the total of discharged patients, 91.3 per cent were suffering from tuberculoid leprosy, 0.8 per cent from the indeterminate form, and 7.9 per cent from the lepromatous type.

In the eight years of its existence the Rostov clinical experimental leprosarium has been able to discharge for outpatient and dispensary treatment 74 per cent of the patients it has treated.

The total of patients discharged to continue their treatment as outpatients under dispensary observation in all the leprosy institutions of the U.S.S.R. in 1953 was twice as large as in 1950. Here, without a doubt, can be seen the beneficial effect of the introduction of the sulfone preparations. The reports of all leprosaria, without exception, evidence the positive effects of the sulfones on leprosy. The general results of treatment may be judged from the following summarized statistics from five leprosaria and the Leprosy Institute (in percentages of the grand totals of patients treated).

<i>Results</i>	<i>1950</i>	<i>1953</i>
Improvement	24%	67%
Deterioration	26%	7%
No change	50%	26%

A great improvement in the results of leprosy treatment has been achieved, and this is shown particularly clearly when the statistics of individual leprosy institutions are studied. Thus, the results of treatment in 1953 at the Leprosy Institute were as follows: Of all patients treated there was improvement in 85 per cent, no change in 12 per cent, and deterioration in 3 per cent.

There was also a sharp decrease in cases of ocular complications, especially iritis and iridocyclitis, which in the past led to partial and complete loss of sight. The effectiveness of sulfone therapy on individual manifestations of the disease is shown by the following statistics. Of the total of patients treated in 1950 in the leprosy institutions of the U.S.S.R., 48 per cent had leprotic ulcers of the skin and 10 per cent had mucous membrane lesions. There was a decrease of more than one-half in the number of patients with skin ulcers, and mucosa lesions were almost four times less prevalent. The healing of leprotic mucous membrane lesions led to a decrease in the number of cases of tracheotomy.

At the same time as the decrease in ulcerous lesions there was a decrease, and quite frequently a complete disappearance, of leprosy bacilli in the scrapings from the nasal mucosa and in the tissue juice of skin lesions. This is of great epidemiologic significance. We now have the prospect of the epidemiologic neutralization of leprosy patients in a comparatively short time, and of discharging them in greater numbers for outpatient treatment.

Treatment is becoming the basic factor governing success in our battle against leprosy. At the present time we cannot tolerate the lack of understanding and utterly unjustifiable conservatism which continues to be shown by some medical workers, and even by the doctors in charge in certain leprosaria, in the problems affecting leprosy treatment. Our urgent task is the improvement of treatment in leprosaria

and its organization on the basis of the present-day achievements of medical science. The treatment of patients in some of our leprosy institutions is unsatisfactory and requires improvement.

In the majority of leprosaria, ocular, otolaryngological, surgical and other forms of specialist treatment are carried out by consultants on call; only in certain leprosaria are there doctors specialized in one or other of these fields.

The complicated and multiform nature of the affections arising from leprosy infection create great difficulties in the treatment of the disease and require a complex of different measures.

In the last few years the arsenal of substances used in treatment has been added to, side by side with new synthetic preparations which have a beneficial effect on the course of the disease.

In a comparatively short time epidemiologic neutralization of the patient is achieved and also, in a proportion of cases, the subsequent clinical recovery of the patient.

It is true that organized treatment in leprosaria is impossible without well-equipped clinical and diagnostic laboratories with qualified staff, without extensive use of the physical methods of treatment (orthopedic, ocular, otolaryngologic, roentgenologic, stomatologic), without systematically conducted autopsies, and without histopathology research.

Each leprosarium should arrange well-managed sections in which wide use is made of water, mineral-spring mud, electricity, and light treatment.

Our task is to reinforce the leprosaria with specialist staffs from those leprologists who have received their training in the Leprosy Institute and other leprosy institutions.

In the formulation of new methods of treatment, attention must be paid to the fight against complications arising from the treatment of the patient.

In the search for new synthetic substances for the treatment of leprosy, it would be advantageous to organize a special chemical laboratory at one of the central chemico-pharmaceutical institutes in order to study the connection between the chemical structure of matter and its influence on the leprosy process; this might make possible the synthesis of new drugs having greater therapeutic effectiveness on the disease.

In the matter of research into methods of increasing body resistance to the leprosy infection, great attention deserves to be paid to the work of the Rostov clinical experimental leprosarium and that of the leprology section of the Central Committee of the Medical Institute in conjunction with the Leprosy Institute.

Considering the long time spent by patients in leprosaria and their capacity for work, thought should be given to the organization of workshops and the creation of work tasks on a broad basis. Prescribed

periods of work in the open air, requiring strenuous muscular effort, are an important factor in making the treatment successful.

Since we have a considerable number of patients who, although epidemiologically neutralized, are subject to further treatment, we should organize treatment not only in leprosaria but also, in those cases where isolation is not necessary, make treatment available at their permanent places of residence.

With new therapeutic resources available, we should study the problem—and come to a decision in the near future—of the possibility of prophylactic treatment for those people who had been in contact with a patient showing suspected leprosy symptoms.

At the present time, in connection with the successes achieved in leprosy therapy, the principle of differentiated accommodations for patients according to the seriousness of their infection should be rigorously brought into effect. For the blind and disabled, and those with incurable infections, special sections should be set up, sufficiently isolated and with separate dining and other facilities; it would be better still to organize separate leprosaria for such cases.

The carrying out of the measures here mentioned will require adequate material and technical backing, a higher degree of qualification and specialization among leprosaria doctors, and a full complement of medical staff.

The Institute for the Study of Leprosy should organize and continue research, in conjunction with other leprosy institutions, on the new preparations produced by the chemico-pharmaceutical industry for the treatment of leprosy. Together with the Rostov clinical experimental leprosarium and the leprology section of the Central Committee of the Medical Institute, we must continue research into methods of treatment and active prophylaxis in its immunobiologic effect on the body with the aim of increasing its resistance to infection.