Lepr. Rev. (1976) **47**, 79-86

Abstracts

1. MICROBIOLOGY

1. SHEPARD, C. C., LEVY, L. & FASAL, P. **Further experience with the rapid bactericidal effect of rifampin on *Mycobacterium leprae*. *Am. J. Trop. Med. Hyg.*,** 1974, v. 23, No. 6, 1120-1124.

"The effect of rifampin therapy in leprosy was studied in two clinical short-term trials in which skin punch biopsy specimens were taken at regular intervals for the inoculation of mice in order to monitor the decrease in proportion of viable *Mycobacteriu leprae* in the patients' lesions. In a trial of rifampin in a dosage of 600 mg daily, the bacterial viability fell to undetectable levels in the first specimen taken after the start of therapy (at 3-4 days in 4 patients, 7-8 days in 9, and 14 days in 2). Dapsone-treated controls required 20 to more than 112 days for the same change. In a trial of a single dose of 1500 mg rifampin, the viability fell to undetectable levels in the first specimen taken after the start of therapy also (at 3-5 days in all 14 patients)."

2. NARAYANAN, K., MANIA, S., BEDI, B. M. S., KIRCHHEIMER, W. F. & BALASUBRAHMANYAN', M. **Experimental transmission of leprosy to animals: a preliminary note on attempt to transmit leprosy to the Indian pangolin *Manis crassicaudata* Geoffroy.** *Lepr. India,* 1974, v. 46, No. 3, 135-139.

The Indian pangolin has scaly armour and a low body temperature, and resembles the armadillo in some respects. Bacilli from a patient with lepromatous leprosy were inoculated into the animal; the result is to be reported separately.

C. S. Goodwin

3. DESIKAN, K. V. **Fate of *Myco. leprae* inoculated into foot-pads of mice.** *Lepr. India,* 1975, v. 47, No. 1, 9-14.

"During the first 3 months after inoculation of mice with *Myco. leprae* harvest of the footpads do not reveal any bacilli. The fate of bacilli during this period is not understood. Study has been conducted to assess the bacillary population in the footpads during this period. It has been found that the number of bacilli falls down to less than half the original number in 24 hours. After 72 hours, only 20% of the bacilli are recoverable. At the end of 8 weeks, harvest from the footpads are practically negative for acid fast bacilli. The possible causes of this steep fall are discussed."

2. IMMUNOLOGY AND PATHOLOGY

4. NAVALKAR, R. G., PATEL, P. J. & DALVI, R. R. **Immunological studies on leprosy: separation and evaluation of the antigens of *Mycobacterium leprae*. *J. Med. Microbiol.*,** 1975, v. 8, No. 2, 319-324.

"Chromatographically separated antigens of *Mycobacterium leprae* were tested for their ability to elicit skin reactions in guinea-pigs sensitized with homologous and heterologous mycobacteria. Of the 3 antigen-positive fractions obtained, one showed specific activity and the other 2 cross-reactivity, as indicated by studies of hypersensitivity and passive cutaneous anaphylaxis.

"The fraction exhibiting specificity contained only one antigen, which was protein in nature, whereas the other 2 fractions contained more than one antigen and possessed both protein and polysaccharide constituents. Because the single-antigen-containing fraction showed both positive skin and PCA reactivity, the suggestion is made that this fraction may contain either an antigen with 2 determinants or may contain 2 antigens that are not easily distinguishable by immunodiffusion methods."

C. S. Goodwin

5. McDOUGALL, A. C., REES, R. J. W., WEDDELL, A. G. M. & WAJDI KANAN, M. **The histopathology of lepromatous leprosy in the nose.** *J. Path.*, 1975, v. 115, No. 4, 215-226.

The recent revival of interest in nasal involvement in leprosy stems from a series of papers which have demonstrated the enormous output of bacilli from the nose that may occur in patients with the lepromatous form of the disease which is comparable to the output from an open case of tuberculosis. The present histopathological study is based on 151 nasal biopsies from 35 patients in Central India, all except 4 of whom had active lepromatous infections. Biopsies of 4 patients with borderline leprosy showed no signs of nasal involvement. In all the 31 patients with lepromatous leprosy, many acid-fast bacilli were found in at least one of the biopsy specimens, the bacilli always being associated with a cellular infiltrate but not with any particular anatomical site in the nose. They were frequently more numerous than in other parts of the body, with a higher percentage of solid (viable) forms than in skin. The main but not the only host cells were macrophages, though the infiltrate was pleomorphic. The number of organisms in blood vessels and lymphatics was striking; it was thought that the direction of movement of bacilli was from endothelial cells into lumen. Frequently these vessels were observed close to the surface epithelium and sometimes they had ruptured. Although there appeared to be various escape routes for bacilli, their discharge was due mainly to secondary infection in the presence of an expansile lepromatous infiltrate, together with simple trauma to the surface epithelium. This discharge is thought to be the main source for the epidemiological spread of *Mycobacterium leprae*. The paper is illustrated with 13 photomicrographs on 6 plates.

[See also *Trop. Dis. Bull.*, 1974, v. 71, abstrs 1028, 1999 and 2521; Rees and Ridley, *Bacteriology and pathology of leprosy*. In *Recent advances in clinical pathology*, Series Six, 1973, edited by S. C. Dyke, Churchill Livingstone.]

D. S. Ridley

6. CLOSS, O. ***In vitro* lymphocyte response to purified derivative, BCG, and *Mycobacterium leprae* in a population not exposed to leprosy.** *Infection & Immunity*, 1975, v. 11, No. 6, 1163-1169.

"Lymphocytes from 14 BCG-vaccinated donors, 7 tuberculin positive and 7 tuberculin negative by skin testing, were stimulated in vitro with 4 mycobacterial antigens, purified protein derivate (PPD), PPD/BCG, whole BCG bacilli, and whole *Mycobacterium leprae* and also with *Candida* antigen and phytohemagglutinin. The response was measured by incorporation of ^{3}H-labeled thymidine. The response to PPD, PPD/BCG, and BCG was found to correlate with the result of skin testing with tuberculin. The tuberculin-positive group also responded more strongly to *Myco. leprae*, whereas the 2 groups did not differ significantly in their response to *Candida* antigen or phytohemagglutinin. These findings indicate a certain degree of cross-reactivity between BCG and *Myco. leprae*. The use of the lymphocyte transformation test to measure antigenic cross-reactivity is discussed."

7. PAUL, R. C., STANFORD, J. L. & CARSWELL, J. W. **Multiple skin testing in leprosy.** *J. Hyg.* Cambridge, 1975, v. 75, No. 1, 57-68.

"Groups of patients with lepromatous and tuberculoid leprosy and hospital staff from 6 leprosaria in East Africa and 'non-contact' groups of villages or staff from general hospitals have been skin tested with 10 reagents. These were prepared by ultrasonic disintegration from *Myco. tuberculosis, Myco. duvalii, Myco. chelonei* and 7 other species identified in the Ugandan environment. Comparisons were made of the percentages of positive reactors in each study group for each reagent. The 'specific' defect of lepromatous patients was found to apply to a variable extent to 6 of the species tested, but not to *Myco. tuberculosis, Myco. avium* or *M. 'A*'*. The defect applied most noticeably to *Myco. nonchromogenicum* and *Myco. vaccae,* suggesting that they are more closely related to *M. leprae* than are the other species tested. The reagent Chelonin produced unexpected and anomalous results in the lepromatous group. It is suggested that this was due to an unusually slow clearing of Arthus' reaction."

W. H. Jopling

8. KWAPINSKI, J. B. G., BECHELLI, L. M., HADDAD, N. & SIMAO, E. T. **Impairment of reactivity to lepromin by mycobacterial antigens related to, or identical with, *Mycobacterium leprae.*** *Can J. Microbiol.,* 1975, v. 21, No. 6, 896-901.

"Three hundred and twenty young children were injected with Bacillus Calmette-Guérin (BCG) saline, or with one of the mycobacterial cytoplasmic antigens related with *Mycobacterium leprae.* At an appropriate time thereafter they were tested for dermal hypersensitivity to the antigens and for reactions to lepromin.

"Whereas all the antigens induced cell-mediated immunity, the incidence and intensity of late response to lepromin were significantly reduced in children preinjected with the cytoplasmic mycobacterial antigens, as contrasted with increased lepromin reactivity in the BCG group and with the findings in saline-injected children."

W. H. Jopling

9. BEIGUELMAN, B. & PISANI, R. C. B. **Effect of DDS on phytohemagglutinin-induced lymphocyte transformation.** *Int. J. Lepr.,* 1974, v. 42, No. 4, 412-415.

"The influence of DDS on PHA-induced lymphocyte transformation was investigated in leukocyte cultures from 2 samples of healthy Caucasoid individuals. In one sample the sulfone-treated cultures differed from the controls in that they contained 0.4 μg/ml of tissue culture medium plus PHA. In the other sample, the treated cultures contained DDS in concentrations of 4 μg/ml, 8 μg/ml and 16 μg/ml.

"The frequency of lymphocyte transformation induced by PHA was significantly reduced by DDS in all concentrations used. The data obtained are a strong indication that the plasma levels of dapsone among leprosy patients may contribute to the depression of the blastogenic capacity of their lymphocytes when stimulated by PHA."

W. H. Jopling

10 AZULAY, R. D. **Lepromin retesting as a factor of lepromin test positivation.** *Int. J. Lepr.,* 1974, v. 42, No. 4, 428-430.

"Repeated lepromin applications in guinea pigs induce a sensitization demonstrated by the progressive intensity of the reactions in subsequent tests.

"The peak of the lepromin reaction in guinea pigs is reached between 2 and 7 days, sooner than that which occurs in man (peak at 21 to 30 days). The lepromin reaction in guinea pigs is, therefore, shortened."

P. A. Jenkins

3. CLINICAL ASPECTS

11. IVESON, J. M. I., McDOUGALL, A. C., LEATHEM, A. J. & HARRIS, H. J. (1975). **Lepromatous leprosy presenting with polyarthritis, myositis, and immune-complex glomerulonephritis.** *Br. Med. J.* **3**, 619.

This is a case report on a Pakistani patient admitted to a general hospital in the UK with acute widespread polyarthritis accompanied with night sweats and fever. Reiter's disease and polyarteritis nodosa were excluded when as a result of muscle tenderness in the legs biopsies of striated muscle and skin revealed changes typical of lepromatous leprosy with large numbers of *Mycobacterium leprae.* Serum showed IgG-IgM cryoglobulinaemia without antiglobulin activity, and in the recovery phase renal biopsy showed a resolving proliferative glomerulonephritis with linear IgG and IgM immunofluorescence and granular deposits of C3. Clinical signs subsided rapidly under steroid treatment and subsequent progress on anti-leprosy drugs was uneventful. The term erythema nodosum leprosum is inadequate and misleading as a title for a common and important immune-complex reaction of lepromatous leprosy, in which numerous body systems may be involved.

From Authors' Summary

12. BARTON, R. P. E. **Lesions of the mouth, pharynx and larynx in lepromatous leprosy.** *Lepr. India,* 1974, v. 46, No. 3, 130-134.

In a study of the mouth, pharynx and larynx in patients with lepromatous leprosy, the author, working in Dichpalli, India, describes his observations. The cooling of these regions by the flow of inspired air is a significant factor in providing suitable conditions for the multiplication of *Mycobaterium leprae,* hence the involvement of the palate in patients who are mouth breathers because of nasal obstruction.

W. H. Jopling

13. GANAPATI, R. & DESIKAN, K. V. **Simultaneous occurrence of lesions of different types of leprosy in a patient—a case report.** *Lepr. India,* 1974, v. 46, No. 3, 148-151.

An Indian woman was admitted to the Central Leprosy Teaching and Research Institute, Chingleput, as a case of lepromatous leprosy, but detailed examination revealed a number of atypical skin lesions and thickened peripheral nerves. Histological studies showed lepromatous changes in nodules and borderline changes in atypical lesions, and the authors suggest that multiple biopsies in patients presenting with clinically dissimilar lesions would contribute to a better understanding of the immunological instability in borderline leprosy.

W. J. Jopling

14. SHESKIN, J. **The case for invisible leprosy.** *Int. J. Derm.,* 1975, v. 14, No. 5, 345-346.

The author briefly reports 3 instances of lepromatous leprosy diagnosed in Israel (out of a total of 262 patients known to be suffering from leprosy), in whom no recognizable and diagnosable skin lesions were said to have been present until, during an episode of erythema nodosum leprosum, lesions appeared that were typical and bacteriologically positive. [In such patients, tell-tale evidence of past leprosy, now quiescent, is almost invariably present in either the skin or the peripheral nerves or in both.]

S. G. Browne

4. THERAPY

15. PALANDE, D. D. **The ulnar nerve in the lower arm in dimorphous leprosy—some observations.** *Lepr. India,* 1974, v. 46, No. 3, 182-187.

This is a description of the findings in 38 leprosy patients at the Sacred Heart Hospital, Sakkottai, who required surgical exploration of one ulnar nerve because of intractable pain. External decompression was carried out in all cases and deep anterior transposition in some. There was no worsening of paralysis as a result of surgery and 17 patients experienced complete relief of pain.

W. H. Jopling

16. PATTYN, S. R. & SAERENS, E. J. **Minimal inhibitory dosage of rifampicin in intermittent treatment of *Mycobacterium leprae* infection in mice.** *Zentbl. Bakt. I. Orig., Ser. A,* 1975, v. 231, No. 4, 503-507.

"The total minimal inhibitory dose of rifampicin determined in the experimental mouse model, was found to be 10 mg/kg body weight, administered once a week for 6 weeks or once every 2 weeks for 12 weeks.

"From these and other results it is suggested that administration of RMP in human treatment can be reduced to a total amount of 7.2 g either as a 600 mg dose once a week for 12 weeks or as a 900 mg dose once a week for 8 weeks.

"At present these regimens can only be used as an introductory treatment for multi-bacillary cases and are still too expensive for developing countries, but their efficacy should be evaluated in the field as sole treatments in tuberculoid cases, since they could signify a substantial economy for the management of the majority of leprosy infections."

C. S. Goodwin

17, RODRIGUEZ, J. N., ABALOS, R. M., REICH, C. V. & TOLENTINO, J. G. **Effects of the administration of B663 [G30,320, Lamprene, clofazimine (Geigy)] on 3 groups of lepromatous and borderline cases of leprosy.** *Int. J. Lepr.,* 1974, v. 42, No. 3, 276-288.

47 leprosy patients in the Philippines were included in this trial, which was of 2 years duration. They were divided into 3 groups: group 1 consisted of 18 patients with relapsed lepromatous leprosy who were given clofazimine 200 mg/day for 6 days a week; group 2 consisted of 15 patients (8 lepromatous and 7 borderline) who were given clofazimine in similar dosage; group 3 consisted of 14 patients (7 lepromatous, 6 borderline, 1 indeterminate) who were given 100 mg dapsone daily for 6 days a week.

The reader will find it very difficult to gain a clear impression of the results of this study, but, if he makes a concentrated effort, will adduce that clinical response was satisfactory in all groups, but bacteriological and histological improvement was better in groups 1 and 2. Dark pigmentation of skin lesions was noted, but it was less marked in borderline lesions. With regard to erythema nodosum leprosum (ENL) reactions, clofazimine had a beneficial effect; whereas ENL was no problem in groups 1 and 2, it complicated treatment in 5 patients in group 3.

It is surprising that in assessing bacteriological improvement the authors report only on the bacteriological index and make no reference to morphology.]

W. H. Jopling

18. PEARSON, J. M. H., REES, R. J. W. & WATERS, M. F. R. **Sulphone resistance in leprosy. A review of one hundred proven clinical cases.** *Lancet,* 1975, July 12, 69-72.

"An account is given of the first 100 consecutive proven cases of sulphone resistance in leprosy, detected in Malaysia between 1963 and 1974. Proof of resistance was clinical in 80 patients and

was obtained by drug-sensitivity testing in mice in 96 patients; 76 cases were proved both clinically and experimentally, and there was no discrepancy between the 2 methods. Sulphone resistance was confined to patients with lepromatous-type leprosy—i.e., patients with a large bacterial population. Clinical evidence of relapse due to drug resistance appeared 5-24 years after the start of sulphone treatment. Low dosage favoured the appearance of resistance; therefore regular treatment of lepromatous leprosy with dapsone in full dosage is recommended. The attainment of 'skin smears negative for leprosy bacilli' is no test of cure of lepromatous leprosy."

W. H. Jopling

19. McLEOD, J. G. *et al.* **Nerve grafting in leprosy**. *Brain,* 1975, v. 98, Pt 2, 203-212.

The authors, writing from Australia, describe a nerve-grafting technique designed to correct sensory loss in leprosy. Median, ulnar, sciatic, and posterior tibial nerves were removed from cadavers within 24 hours of death and stored in physiological saline at 0-10° C for up to 2 weeks. They were then cut into suitable lengths and the diameters were measured. The nerves were freeze-dried, placed in individually sealed double-layered polythene bags and, after irradiation, stored at 4° C. Strips of infant dura mater were similarly prepared, and were subsequently fashioned into cylinders of varying lengths and diameters to be used as cuffs to hold nerve grafts in position. 23 nerve grafts were inserted into the peripheral nerves of 14 leprosy patients suffering from sensory loss: 10 into median nerves, 8 into posterior tibial nerves, 4 into ulnar nerves, and 1 was a branch graft from a median nerve proximally to both median and ulnar nerves distally. Azathioprine was given to each patient for immunosuppression. Results were good in 2 grafts, fair in 7 grafts, and poor in 8 grafts, 6 were failures. Although there was no return of motor function, no patient was worse clinically after operation than beforehand.

The authors consider these results encouraging but emphasize that the technique of nerve grafting in leprosy is only in the developmental stage and its limitation must be appreciated (See also *Lancet,* 1975, Aug. 2, 216.)

W. H. Jopling

20 NEBOUT, M. Bilan de huit ans d'autotraitement des lépreux du secteur no 3 de Moundou (Tchad). **[Results of 8 years' self-treatment of leprosy in the third sector of Moundou (Chad).]** *Bull. Soc. Path. Exot.,* 1974, v. 67, No. 5, 484-494. English summary.

The author writes enthusiastically—and convincingly— of the advantages of the scheme of self-treatment of leprosy introduced into certain countries of farancophone Africa. He describes the results of the first 8 years. functioning of the scheme in the country that pioneered it, the Republic of Chad.

Concurrently with the organization of the mobile teams supervising the out-patient leprosy treatment/control scheme, went the transformation of the oldstyle leprosy settlements into acute leprosy hospitals to which patients could be admitted for short-term treatment or investigation. Laboratory cover was ensured by a microscopist competent to examine the nasal mucus and skin biopsies.

By reducing the number of visits of the mobile teams, the cooperation of the local village leaders was enlisted and retained, a factor considered to be essential in the outworking of the programme.

The total number of patients under treatment fell from 17,071 to 6291 in 8 years, and the number "disease arrested" reached 10,364.

The prevalence fell from 3.7 to 0.83%, and the annual incidence from 0.12 to 0.011%.

The author attributes the success of the scheme to the complete coverage of the population, adequate provision for treatment, temporary hospitalization of those with multibacillary disease, the cooperation of the administration services, and health education of the population.

S. G. Browne

21. TOLENTINO, J. G., RODRIGUEZ, J. N. & ABALOS, R. M. **Controlled long-term therapy of leprosy with B663 (Lamprene, clofazimine) compared with DDS.** *Int. J. Lepr.,* 1974, v. 42, No. 4, 416-418.

This is a continuation of a preliminary report published in 1971 [*Trop. Dis. Bull.,* 1972, v. 69, abstr. 1685], and covers a 4-year period during which 16 of the original 43 patients completed the study, 9 on clofazimine (Lamprene; B663) and 7 on dapsone (DDS). The 2 drugs were found to be comparable in efficacy and safety, but erythema nodosum leprosum reactions were less severe and less frequent in the B663 group. No resistance to either drug was encountered.

[It is frustrating for the reader who wants to know about dosages used in this trial to be referred to the preliminary report.]

W. H. Jopling

5. EPIDEMIOLOGY, PREVENTION AND CONTROL

22. CHATTERJEE, B. R. **Are children the most susceptible to leprosy?** *Lepr. India,* 1974, v. 46, No. 3, 197-200.

In the area monitored by the Jhalda leprosy control unit in West Bengal the incidence of leprosy in children is 3 times lower than in adults. The incidence in children reported by other workers is reviewed.

C. S. Goodwin

23. SHARMA, S. N. & SAXENA, V. B. **An epidemiological study of rural leprosy problem in Dharsiwa block of Raipur district (M.P.).—I. Prevalence pattern.** *Lepr. India,* 1974, v. 46, No. 3, 157-171. **II. Transmission trends.** *Ibid.,* 172-181.

I. 8738 people, comprising 88% of the population, were examined for leprosy in a district of Madhya Pradesh; 38 cases of leprosy were discovered, a prevalence rate per 1000 of 4.34. 24% of the patients had lepromatous leprosy and 45% of the others had nerve involvement; "bilateral involvement was common". The prevalence in children was 26 per 1000. 9 tables give details of the survey.

II. Of 92 villages in which there were patients with leprosy, 38 had patients with lepromatous leprosy. 7 tables give analyses such as the age of onset of leprosy, history of leprosy in the family, result of lepromin test, and ABO blood groups.

C. S. Goodwin

6. REHABILITATION AND SOCIAL ASPECTS

24. DWIVEDI, M. P. **A study of medico social problems of cured leprosy cases in the Pandri village of Raipur District, M.P.** *Lepr. India,* 1974, v. 46, No. 4, 245-252.

Although this study was made 5 years ago in the State of Madhya Pradesh, India, it is unfortunately still relevant not only to other areas in the Indian subcontinent but also to South-East Asia, South America and Africa. The subjects were 132 families, comprising 286 people, living near a leprosy hospital. Altogether 222 of them, having had treatment for leprosy, were now regarded as "cured". They had been rejected by their relatives, denied a welcome and work by their fellow-villagers, and existed in single-person or small family units in a typical Indian village (like the "*villages de post-cure*" of francophone Africa).

At least three-quarters of them were classed as beggars; and only 15% were literate.

Addiction to hemp, tobacco and alcohol was very common, tobacco chewing being the principal addiction of the women.

Over half of the residents who had had leprosy retained some degree of disability—often severe, and usually stigmatizing.

The medico-social problems posed by this village of leprosy beggars, typical of many, are briefly and objectively described. The deep-seated social rejection of deformed leprosy sufferers, which leads to a feeling of apathy and inertia on their part, may be perpetuated by institutionalization and by unscientific and inhuman attitudes both to leprosy and to its victims.

S. G. Browne

25. RANNEY, D. A. **Rehabilitation goals in leprosy surgery.** *Lepr. India,* 1974, v. 46, No. 4, 253-257.

Writing out of his experiences in Karigiri, South India, the author summarizes the physical, socio-economic and psychological problems besetting patients suffering from leprosy. About a third of the patients had some degree of disability, due to neglected leprosy, already present when they first came for diagnosis and treatment— an indication of the inadequacy of case-finding procedures. Lagophthalmos resulting from upper facial palsy, claw hand and ulcerated feet point the obvious moral.

The author rightly insists on the importance of appearance as well as of function, if a patient with established deformity is to be accepted back into his family and community as a working member. Surgical correction or removal of obvious stigmatizing lesions is one of the ways to achieve this. Education in the use of insensitive extremities, retraining at one of the special centres available, the provision of tools and appliances with specially adapted handles may all help the ex-leprosy patient to face life anew and help the community to accept him.

Fear and rejection are the psychological factors that explain much of the meagre results accruing from many leprosy programmes. The patient with multiple deformities may need a succession of skilled surgical interventions before he is able to take his place in society.

[In the face of this rather grim picture of the difficulties encountered in attaining the goals enumerated, the modern insistence on prevention of deformity by early detection and adequate treatment assumes a greater importance.]

S. G. Browne

Thanks are due to the Director, Bureau of Hygiene and Tropical Diseases, for permission to reprint Abstracts from *Tropical Diseases Bulletin,* August-October 1975.