

**HANSENÍASE: RESUMOS**  
**HANSENIASIS ABSTRACTS**

BACTERIOLOGIA, IMUNOLOGIA  
BACTERIOLOGY, IMMUNOLOGY

ABE, M.; MINAGAWA, F.; YOSHINO, Y.; OZAWA, T.; SAIKAWA, K.; SAITO, T. Fluorescent leprosy antibody absorption (FLA-ABS) test for detecting subclinical infection with *Mycobacterium leprae* *Int. J. Lep.*, 48 (2) :109-119, 1980.

The fluorescent leprosy antibody absorption (FLA-ABS) test was improved by absorbing the serum with suspensions of BCG and *M. vaccae*. This test was positive in nearly 100% of patients with bacteriologically positive forms of leprosy and in approximately 80% of tuberculoid cases but negative in 18 patients with pulmonary tuberculosis, in 50 healthy noncontacts, and in 136 of 138 non-leprosy patients in general hospitals. The 2 positive sera of the last group showed a cross-reaction with *M. smegmatis*, but *M. smegmatis* were incapable of absorbing the positive reactions to *M. leprae*. Therefore, the serological sensitivity and the specificity of the FLA-ABS test proved to be satisfactory for detecting subclinical infections with *M. leprae*. The test was positive in 57 of 62 (91.9%) household contacts of leprosy patients. The mean antibody titers were higher in infants, in grandchildren and children of patients, and in contacts of lepromatous patients than in comparison groups. Among 39 of these household contacts who were tested with lepromin, 7 showed doubtful Mitsuda reactions but were positive in the FLA-ABS test. Such cases should be carefully observed since they are apparently infected with *M. leprae* but have not developed cell mediated immunity. Among 15,000 school children in a leprosy endemic area, 173 children were tested with FLA-ABS because they had a palpable auricular nerve or a suspicious skin eruption. A positive reaction was found in 109 (63%) of them. The percentage of positivity was slightly higher in the villages than in an urban area, corresponding to a higher leprosy incidence rate in the former. The FLA-ABS test results showed no cor-

relation with the results of tuberculin tests or a history of BCG vaccination in these children. Their sera were also examined by indirect immunofluorescence with smears of BCG (BCG-FA test) and by the rubella virus hemagglutination inhibition test, and these tests showed no correlation with the FLAABS test. Among 58 sera in which both the FLA-ABS and the BCG-FA tests were positive, 57 sera did not react with 6 species of mycobacteria other than *M. leprae*; one serum did react with the other mycobacterial species, and this person was later found to have leprosy. From these observations it is presumed that the rate of subclinical infection with *M. leprae* in the schoolchildren in this area is at least 0.7% and is almost 200 times higher than the leprosy incidence rate in this area.

Authors' summary

ANDERSON, R. & GATNER, E.M.S. Changes in neutrophil motility accompanying dapsone and rifampicin therapy. *Lepr. Rev.*, 52 (1) :19-22, 1981.

Dapsone has been shown to stimulate the motility of normal neutrophils in vitro and the neutrophils of patients with lepromatous and tuberculoid leprosy in vivo. It is suggested that dapsone possesses immunostimulatory activity.

Authors' summary

BECHELLI, L.M.; HADDAD, N.; PAGNANO P.M.G.; NEVES, R.G.; MELCHIOR Jr., M.; FREGNAN, R.C. Double blind trials to determine the late reactivity of leprosy patients and unaffected persons to different concentrations of armadillo lepromin in comparison to human lepromin. *Int. J. Lep.*, 48(2) :126-134, 1980.

The authors carried out 3 double blind trials to determine the late reactivity of 103 leprosy patients and unaffected persons to

different concentrations of armadillo lepromin (160, 40, 20, 10, 5, 2.5, and  $x \times 10^6$  bacilli/ml) in comparison to human lepromin (40  $\times 10^6$  bacilli/ml). Their conclusions are as follows: 1) From the comparison of several concentrations of armadillo lepromin (160, 40, 20, 10, 5, 2.5, and 1 million bacilli/ml) to human lepromin (40 million bacilli/ml), it seems that the content of 1 million bacilli/ml would be the most adequate for current use in unaffected persons; it allows a substantial saving of antigen and could reduce the proportion of false positive reactions. 2) For leprosy patients the lowest concentration of armadillo lepromin tested was 20 million bacilli/ml, but when analyzing all the findings, it seems that lower concentrations (5, 2.5, and perhaps better, 1 million bacilli/ml) could be suggested for their testing in routine work, also avoiding false positive reactions in lepromatous patients. 3) The late reactions to armadillo lepromins (from 160 to 2.5 million bacilli/ml) were stronger than those observed in response to human lepromin (40 million bacilli/ml); tissue components of armadillo lepromin (mainly proteins) might be responsible for this finding. 4) Stronger reactions to human lepromin (40 million bacilli/ml) were coincident with the higher bacillary contents of simultaneously administered armadillo lepromins (160, 40, and 20 million bacilli/ml), and their intensity decreased in each trial with the lower concentrations of the armadillo lepromins. The reactivities to human lepromin and perhaps also to armadillo lepromins might have been enhanced by their simultaneous injections.

Authors' summary

BIRDI, T.J.; SALGAME, P.R.; MAHADEVAN P.R.; ANTIA, N.H. Role of macrophages in defective cell mediated immunity in lepromatous leprosy. II. Macrophage and lymphocyte Interaction. *Int. J. Lepr.*, 48(2):178-182, 1980.

Macrophages from lepromatous patients after phagocytosis of *M. leprae* showed alteration in their surface property as determined by their ability to express Fc receptors. The same macrophages without intracellular *M. leprae* show normal Fc receptors. The lepromatous macrophages also show very poor interaction with lymphocytes in the presence of *M. leprae* while they are able to interact with lymphocytes when exposed to other antigens.

These observations along with earlier ones on macrophage defects have indicated a probable reason for defective cell mediated immunity (CMI) in lepromatous leprosy patients. There appears to be a defective

macrophage population in lepromatous patients that is unable to process *M. leprae* antigens and initiate the CMI response.

Authors' summary

BJUNE, G. Variation of in vitro lymphocyte responses to *M. leprae* antigen in borderline tuberculoid leprosy patients. *mnt. J. Lepr.*, 48 (1):30-40, 1980.

Out of 157 patients with a clinical classification of borderline tuberculoid leprosy, 88 did not respond significantly in the in vitro lymphocyte stimulation test to the commonly used doses of leprosy bacilli. A large group of "non-responders" in this test is a usual finding in spite of clinical and histological evidence of good cell mediated immune response to *Mycobacterium leprae* in borderline tuberculoid patients. Some of the factors which might explain failure to respond in this test were evaluated. About 20% of BT patients who did not respond to the commonly used doses of *M. leprae* did respond significantly to lower doses. Variation in antigen specificity of the in vitro lymphocyte responses, together with variation in antigenic presentation in different preparations of *M. leprae* antigens, caused some individuals to be non-responsive to one preparation and at the same time respond strongly to another preparation. Some of the patients had factor(s) in their plasma which caused a severe suppression of the response to *M. leprae* in the test, while the same cells responded well when they were cultured in sera from persons not exposed to leprosy. There was no clear negative correlation between antibody responses to one important *M. leprae* antigen and the in vitro responses to *M. leprae* preparations which exposed the same antigen. The kinetics of the responding cells did not show individual variation great enough to explain a lack of in vitro response when the cultures were harvested on day six or seven. It is concluded that the in vitro lymphocyte stimulation test in its present form gives inconclusive results for evaluating the patients' immune resistance to the disease.

Author's summary

BRENNAN, P.J. & BARROW, W.W. Evidence for species-specific lipid antigens in *Mycobacterium leprae*. *Int. J. Lepr.*, 48(4):382-387, 1980.

A partially purified lipid fraction from *Mycobacterium leprae* yielded distinct lines of precipitation with antisera from two lepromatous patients and from an infected armadillo.

There was no reaction to the sera from patients with tuberculosis or a *M. avium* infection or to the serum from a normal armadillo. The activity in the lipid fraction was unaffected by mild alkali, and upon hydrolysis the fraction yielded 6-deoxyhexoses. This information suggests that the lipid antigens of *M. leprae* may be species specific and related to the A, B, C or G mycosides.

Authors' summary

CHATTERJEE, B.R. Cultivable precursors of *Mycobacterium leprae*. *Lepr. India*, 52(4) :513-526, 1980.

During attempts at test tube culture of *M. leprae* in our laboratory we have repeatedly isolated a non-acid fast, coccoid organism from lepromatous tissue and skin smears. These organisms show a tendency to generate acid fast mycobacteria in test tube passages and in mice experimentally infected with these organisms, and a number of stable, pigmented mycobacterial cultures have been obtained from them that are being maintained in test tube media. In the first report cited above it was postulated that these coccoid organisms of leprosy origin were a cultivable precursor phase of the noncultivable *M. leprae*, and further that *M. leprae* was a pleomorphic organism that has a cultivable non-mycobacterial phase. Since these reports, further studies have been made on these precursor organisms, as well as mycobacteria that either grew out of the coccoid precursors, or isolated in pure culture from lepromatous tissues and appeared to be identical. This paper deals with the biochemical and drug sensitivity patterns, and infectivity in experimentally inoculated mice, of a few of these non-acid fast coccoid strains, and their mycobacterial progenies, i.e., mycobacterial converts from the coccoids, and a few mycobacterial strains isolated straight away from lepromatous nodules that showed quite identical characteristics.

Author's abstract

CULLINS, F.M.; MORRISON, N.E.; DHOPLE, A.M.; WATSON, S.R. Microscopic counts carried out on *Mycobacterium leprae* and *M. tuberculosis* suspensions. A comparison of three staining procedures. *Mt. J. Lepr.*, 48 (4) :402-407, 1980.

Standard smears of heat-killed *Mycobacterium leprae* and *M. tuberculosis* H<sub>37</sub>Rv were counted microscopically following staining by the Ziehl-Neelsen, auramine, and silver-methenamine methods. The numbers of stained bacillary bodies were consistently higher in

the silver-methenamine stained smears compared to the Ziehl-Neelsen and auramine stained smears. The auramine smears were examined under ultraviolet illumination and permitted the enumeration of the brightly fluorescent bacilli against a black background. The auramine counts were not as high as those obtained using the silver-methenamine stained preparations but were consistently higher than those obtained with the Ziehl-Neelsen preparations. Both the auramine and silver-methenamine stained preparations clearly outlined the cell walls of the bacilli in the smears and this greatly facilitated the counting process, especially if the cell suspension was badly clumped.

Authors' abstract

KATOCH, V.M.; MUKHERJEE, A.; GIRDHAR, B.K. A bacteriological and histopathological study of apparently normal skin in lepromatous leprosy. *Lepr. India*, 52 (4) :508-512, 1980.

A comparative study of clinically affected and apparently uninvolved skin in lepromatous patients has been undertaken in 22 cases. Parameters studied include skin smears for bacillary index; bacillary load/gm of tissue and histopathological comparison of granuloma fraction and biopsy index. The results showed that the clinically unaffected sites have a lower bacillary index and lesser bacterial load. Histologically the granulomas were smaller and biopsy index was lower in uninvolved areas. The possible reasons for this comparative less involvement are discussed.

Authors' abstract

KUMAR, B.; GANGULY, N. K.; KAUR, S.; SHARMA, S.; CHAKRAVARTY; MAHAJAN, R. C. Complement profile in leprosy. *Lepr. India*, 52(2):217-222, 1980.

Serum complement levels of CH 50, Clq, C3 and C4 were studied in 62 patients of various types of leprosy. CH 50 and C3 levels were found to be normal in lepromatous leprosy (LL) but elevated in LL with erythema nodosum leprosum (ENL) patients. Values of C3 and CH 50 were low in borderline lepromatous (BL) patients. Clq were elevated in LL, LL with ENL and BL categories of patients. C4 levels were unchanged in every type of leprosy. Serial studies were done in 5 patients of LL with ENL which were followed over a period of 4 months. In the present study along with polar lepromatous and tuberculoid types and ENL patients, borderline borderline (BB) and borderline lepromatous (BL) varieties have also been

investigated for serum values of CB' 50, Clq, C2 and C3. These factors (except C3, which takes part in both classical and alternate pathways) take part only in the classical pathway of complement activation.

From authors' summary

KUMAR, B.; KAUR, S.; GANGULY, N. K.  
Assessment of diluted Dharmendra lepromin. *Lepr. India*, 52(4):482-490, 1980.

Twenty-one patients of lepromatous and tuberculoid type were tested with standard, 1:2 and 1:4 diluted Dharmendra lepromin. It was found that correlation exists between the degree of induration and the number of bacilli in the lepromin. Uniform and reproducible results were obtained with Dharmendra antigen containing 40 million bacilli/ml. This is of special significance in enhancing the present meagre supplies of lepromin.

Authors' abstract

KUMAR, B.; KAUR, S.; GANGULY, N. K.; SHARMA, S. Cutaneous responses to antigens and irritants in patients of leprosy. *Lepr. India*, 52(3):405-410, 1980.

Forty seven patients of various types of leprosy were skin tested with PPD, Dharmendra lepromin, DNCB, Coccidioidin, histamine and croton oil. Twenty five age matched normal controls were also included in the study. All types of leprosy patients reacted in smaller numbers and with decreased response to all antigens and irritants as compared to normal controls. Depression of response being minimum in tuberculoid and maximum in lepromatous group. None of the patients or controls reacted to coccidioidin. Details are given.

Authors' summary

LENKA, M. R.; GHOSH, E.; PANJA, S. K.  
Incidence of Australia antigen in leprosy. *Lepr. India*, 53(1):38-44, 1981.

Ninety seven male patients attending the leprosy clinic of the Dermatology Out-patients' Department were studied for the detection of Australia antigen. There was a 20% antigen positivity in patients suffering from lepromatous leprosy and 5.7% in the cases with tuberculoid leprosy. SGPT level was found to be significant in patients with lepromatous leprosy having Australia antigen as compared to other groups.

Authors' abstract

MUKHERJEE, R.; MAHADEVAN, P.R.; ANTIA, N.H. Organized nerve culture. I. A technique to study the effect of *M. leprae* infection. *Int. J. Lepr.*, 48(2) : 183-188, 1980.

Neonatal dorsal root ganglia were cultivated *in vitro* by the technique of Murray. Within a week bundles of organized nerve fibers containing proliferating Schwann cells in different phases of axon association and fibroblast cells destined to become peri- or endoneural cells were obtained. Many of these nerve fibers were myelinated within 3-4 weeks. Such 1 or 2 week old cultures were inoculated with *M. leprae*, and bacilli were found in the cytoplasm of Schwann cells and fibroblasts, demonstrating that these cells are phagocytic in nature and that it is possible to infect them with *M. leprae*. Schwann cells, mostly in the free or early association phase, engulfed the bacilli, and this affected their further interaction with the axons and subsequent myelin synthesis.

Authors' summary

NAIK, S.S. & GURNANI, S. Serum lysozyme in leprosy. *Lepr. India*, 52(4) :501-507, 1980.

Serum lysozyme was assessed in 43 healthy subjects and 183 leprosy patients. Significantly elevated level of lysozyme was observed in sera of leprosy patients as compared to normal individuals. The enzyme levels in leprosy of different types showed elevations in following order, Erythema Nodosum Leprosum (ENL) > Lepromatous > Borderline > Tuberculoid. Enzyme levels in patients with inactive stage were lower than in untreated patients. The serum lysozyme level correlated well with the activity of disease in leprosy- clinically and bacteriologically. Thus the estimation of serum lysozyme can be used as one of the parameters of activity of the disease.

Authors' abstract

NATH, I.; NARAYANAN, R.B.; SATHISH, M.; AHUJA, G.K.; BRUTANI, L.B.; SINGH, R. Selective loss of *Mycobacterium leprae* responsiveness of circulating lymphocytes in primary neuritic leprosy. *Lepr. Rev.*, 52(1) :79-89, 1981.

Sixteen patients with primary neuritic leprosy characterized by neural involvement in the absence of dermal lesions were studied. Eight healthy contacts from non-endemic areas formed the control group. T and B cell numbers as well as lymphocyte transformation

responses to Concanavalin A (Con A), Phytohaemagglutinin (PHA) and PPD were not found to be significantly decreased in the majority of the neuritic patients. However, there was a selective uniform lack of *M. leprae* induced lymphocyte transformation in this group (Median stimulation index — 1.05). In 3 of the patients, the antigen specific unresponsiveness was present even after 5 years of chemotherapy. The clinical extent of neural involvement and serum factors did not appear to contribute to the antigen specific deficit observed in this form of leprosy.

Authors' summary

NAVALKAR, R. G.; CHAPARAS, S.D.; LAKSHIMINARAYANA, C.H.; RAN-CHANA, M.V. Antigenic evaluation of *Mycobacterium vaccae* in relation to *Mycobacterium leprae*. *Int. J. Lepr.*, 48(4) :388-395, 1980.

Immunodiffusion analysis of *Mycobacterium vaccae* indicated the presence of at least nine antigens. Using the technique of fused rocket immunoelectrophoresis, at least 13 such antigens were detected. Comparative analysis of the *M. vaccae* antigen-antibody system with similar systems established for other mycobacterial species showed that *M. vaccae* shared a significant number of antigens with both typical and atypical mycobacteria. These included the already described beta and delta antigens that are common to the majority of mycobacterial species. Confirmation of the presence of these two antigens was obtained through comparative analysis of sera from leprosy patients, using *M. vaccae* and *M. smegmatis* conjointly. It has been concluded that *M. vaccae* possess the two most commonly shared antigens among various mycobacterial species, in addition to many others. It has not been possible with the methods employed to establish any particularly close immunological relationship between *M. vaccae* and *M. leprae* that would indicate the use of *M. vaccae* as a possible antileprosy vaccine source although this possibility has been suggested by other investigators.

Authors' summary

PARVEZ, M.; SHARDA, D.P.; JAIN, A K ; BHARGAVA, N.C.; MISRA, S.N. A study of serum protein in leprosy. *Lepr. India*, 52(3) :374-382, 1980.

Total serum protein albumin, globulin and A/G ratio were determined in 50 patients of different types of leprosy and 15 healthy controls. A significant elevation of total serum

proteins ( $P < 0.001$ ) was observed in 25 patients of lepromatous leprosy and 10 patients of lepra reaction. No statistically significant alteration in total serum protein ( $P < 0.05$ ) was observed in 15 patients of non-lepromatous leprosy. A significant fall in serum albumin with concomitant rise in serum globulin level ( $P < 0.001$ ) was observed in non-lepromatous leprosy, lepromatous and patients having lepra-reaction.

Authors' abstract

REA, T.H. & LEVAN, N.E. Variations in dinitrochlorobenzene responsiveness in untreated leprosy: evidence of a beneficial role for anergy. *Int. J. Lepr.*, 48(2): 120-125, 1980.

Cell-mediated immune responses in 52 patients with untreated leprosy were measured by attempted dinitrochlorobenzene (DNCB) sensitization and tuberculin skin tests. In the 13 tuberculoid patients, DNCB responses did not differ significantly from those of the 41 controls. In the 18 borderline and 21 lepromatous patients, DNCB responses were statistically significantly less than those of the controls. Of these 39 borderline and lepromatous patients, 18 responded positively to DNCB. Included among these 18 responders were most of the patients with reactional states, i.e., 7 of 10 with erythema nodosum leprosum, 3 of 4 with Lucio's reaction, and

4 of 5 with incipient reversal reactions. Only 5 of the 20 nonresponders were so troubled with reactional states. In the 19 borderline and lepromatous patients with reactional states, DNCB responsiveness did not differ significantly from that of controls. In the 20 patients without reactional states, DNCB responsiveness was significantly less than that of controls,  $p < 0.0001$ , at the 32 ag/ems and 16 sg/cma levels of challenge. Thus, anergy was demonstrable in borderline and lepromatous subjects, was absent or greatly attenuated in reactional states, and was particularly prevalent in patients without reactional states. Because reactional states are a major source of tissue injury in patients with leprosy, anergy is, or is associated with, a phenomenon of great benefit to the host.

Authors' summary

SACHDEV, H.N.; MATHUR, D.R.; CHAWLA, S.N. Status of circulating T lymphocyte population in leprosy. *Lepr. India*, 52(3) :383-389, 1980.

T lymphocyte population was estimated in 40 cases of various types of leprosy by E-rosette formation. The mean percentage value of T-lymphocyte was significantly low

in lepromatous group as compared to tuberculoid and borderline leprosy. The mean percentage population of 'T' lymphocyte was also compared with 24 normal healthy control cases and significantly low levels were observed in all types of leprosy. The population of 'T' lymphocytes was also co-related with tuberculin tests in leprosy patients and healthy control cases. Lowest count of 'T' lymphocyte population and smallest diameter of erythema was observed in lepromatous leprosy, suggesting impaired cell mediated immunity in this group.

Authors' summary

SALGAME, P.R.; BIRDI, T.J.; MAHADEVAN, P.R.; ANTIA N.H. Role of macrophages in defective cell mediated immunity in lepromatous leprosy. I. factor(s) from macrophages affecting protein synthesis and lymphocyte transformation. *Int. J. Lepr.*, 48(2):172-177, 1980.

Macrophages from lepromatous leprosy patients specifically show reduced protein synthesis in the presence of *M. leprae*. They also produce, as a result of interaction with *M. leprae*, factor (s) that reduce protein synthesis in normal macrophages as well as block lymphocyte transformation in normal leukocyte cultures in the presence of *M. leprae* as the antigen. These observations implicate a defective macrophage system in lepromatous leprosy patients.

Authors' summary

SINHA, S.; SENGUPTA, U.; RAMU, G.; DESIKAN, K.V. Assessment of Dharmendra antigen. (IV)Antigenic analysis of lepromins. *Lepr. India*, 53(1):6-10, 1981.

In order to pinpoint the active portion of the skin antigens including Dharmendra and other lepromins, a study was carried out by subjecting the antigens to electrophoretic and immunoelectrophoretic analysis. These analyses identified two components, anionic and cationic, in lepromin sonicates. The anionic component was stainable with a protein stain, whereas cationic component formed precipitin arcs on immunoelectrophoresis with sera from lepromatous leprosy patients. BCG sonicate could also be resolved into two similar components. The cationic component of BCG apparently a glycoprotein, cross reacted with cationic component of lepromin and also showed a reaction of identity in gel diffusion. The specificity of anionic (proteinaceous) component of lepromin remains to be established.

Authors' abstract

SIVAMANI, S.; GARG, B.R.; LAL, S. Leukocyte migration inhibition test in leprosy patients across the spectrum of leprosy. *Lepr. India*, 52(4):527-531, 1980.

The leukocyte migration inhibition test (LMIT) using Dharmendra's antigen was performed in 21 cases of leprosy classified according to Ridley Jopling Scale (1966). The degree of migration correlated well with the classification as expected thus confirming the immunological validity of Ridley-Jopling classification.

Authors' abstract

SIVAMANI, S.; GARG, B.R.; LAL, S. Quantitative DNCB epicutaneous sensitization in leprosy patients and controls. *Lepr. India*, 58(1):45-51, 1981.

Status of non-specific cell mediated immunity in 49 leprosy patients classified according to Ridley & Jopling scale and 16 non leprosy controls was studied using epicutaneous sensitization with DNCB and quantitatively grading the degree of sensitization and Mx. test with 1 TU PPD. The effect of dapsone administration on CMI responses was also observed. There was no gross depression of CMI responses as made out by epicutaneous sensitization to DNCB but quantitative grading of responses revealed a subtle depression of CMI responses progressively increasing from TT to LL end of spectrum. Mx. testing with 1 Tu PPD did not appear to be a good parameter to study the CMI status. Dapsone administration did not alter the CMI responses.

Authors' abstract

STONER, G.L. Hypothesis: do phases of immunosuppression during a *Mycobacterium leprae* infection determine the leprosy spectrum? *Lepr. Rev.*, 52(1):1-10, 1981.

The failure of the cell-mediated immune response to *Mycobacterium leprae* in leprosy is amply documented, but the immunoregulatory mechanisms involved are unknown. It is suggested that suppressor mechanisms could explain the spectrum of immunity observed in leprosy, and a primary specific immunodeficiency need not be invoked. Three major phases of suppression can be identified. The primary suppression phase may be a consequence of the neural predilection of *M. leprae* which insures preferential exposure of bacillary antigens to suppressor cells in the spleen, rather than to effector cells in the draining lymph node. This view of the leprosy

spectrum can accommodate recent findings of an HLA association of tuberculoid leprosy. It also has implications for the interpretation of leprosy vaccine trial data.

Author's summary

TARABINI-CASTELLANI, G.; TARABINI-CASTELLANI, G.L.; NUTI, M. Conversión del Mitsuda negativo en positivo, en sujetos Banos y en enfermos de tuberculosis, mediante la repetición del test con lepromina de armadillo. *Rev. Lepr. Fontilles*, 12(6):761-766, 1980.

Out of a total of 191 subjects — namely: 138 healthy individuals (28 children and 110 adults), 45 Tb patients (35 cases of Tb of the lungs and 10 cases of glandular Tb), and 8 cases of lepromatous leprosy- whose response to a first lepromin A test ( $40 \times 10^7$  M. leprae/ml.), administered one or two months earlier had been negative, at the time of a second test 63'35% of cases showed the conversion of the Mitsuda response from negative to positive. In particular: among the children the conversion appeared in 75% of cases, but the response was weak, in no case exceeding 2 +; the conversion attained 72'72%, with 9'09% of ulcerated nodules, among the adults; the conversion among subjects suffering from Tb of the lungs was 51'43% : in no case did the response exceed 2 -F and was 11'22% of ulcerated nodules; among the subjects suffering from glandular Tb, the conversion attained 20%, and did not exceed 1 +, nor caused ulcerated nodules; no

conversion was observed in the lepromatous patients.

Authors' summary

VELIATH, A.J.; BEDI, B.M.S.; BALASU-BRAHMANYAN, M. Macrophage culture from untreated leprosy cases. *Lepr. India*, 52(2):203-208, 1980.

Macrophage cultures from the peripheral blood were performed in 25 untreated bacteraemic leprosy patients. The monocytes on conversion to macrophages in culture continued to harbour solidly stained *M. leprae* till the termination of culture. It is suggested that the majority of these bacilli are viable and capable of multiplication intracellularly in macrophages if cultures could be maintained for sufficiently long periods. It was observed that bacteraemia in leprosy can be detected by the culture technic. It has been found to be more sensitive than the leukocyte adherence method.

Authors' abstract

WHEELER, P.R. & DRAPER, P. Soluble blue as a counterstain in the Ziehl-Neelsen procedure — a brief communication. *Int. J. Lepr.*, 48 (1) :15-17, 1980.

A technique is described using soluble blue instead of the conventional methylene blue as a counterstain for the Ziehl-Neelsen procedure. This increases the intensity of blue staining of non-bacterial contaminants and is useful in monitoring the Progress of purification of *M. leprae* from host tissue.

Authors' summary

## PATOLOGIA, FISIOPATOLOGIA, BIOQUÍMICA PATHOLOGY, PHYSIOPATHOLOGY, BIOCHEMISTRY

CHANDI, S.M.; CHACKO, C.J.G.; FRITSCHI, E.P.; JOB, C.K. Segmental necrotizing granulomatous neuritis of leprosy. *Int. J. Lepr.*, 48(1) :41-47, 1980.

In leprosy, the occurrence of necrotizing nodular lesions in peripheral nerves is a relatively uncommon complication. Despite clinical and gross similarities, there are microscopical differences among groups of such cases, indicating that in all probability different pathogenetic mechanisms are operative. Furthermore, the vast majority of such cases are not true abscesses but are characterized by caseous necrosis and granulomatous inflammation. The traditional collective name "nerve

abscess" is therefore inappropriate. Presented herein is an analytic study of 30 cases of the commonest variant, which we suggest should be called segmental necrotizing granulomatous neuritis of leprosy (SNGN). This lesion commonly affects the right ulnar nerve just above the elbow and occurs most often in those with the borderline tuberculoid form of leprosy. It appears to represent the result of a hypersensitivity phenomenon marked by a preponderance of epithelioid cells rather than a reaction of *immunity* in which lymphocytes predominate. Acid fast bacilli were demonstrable in the lesion in 77% of cases.

Authors' summary

DASTUR, D.K. & DAVER, S.M. Striated muscle in four categories of leprosy. H. Fine structural changes. *Int. J. Lepr.*, 48(2):149-158, 1980.

Fine structural changes are described in 21 muscle biopsy specimens from patients with early and established tuberculoid or treated and untreated lepromatous leprosy. The predominant light microscopic finding on paraffin sections of atrophy of the muscle fiber was confirmed in semithin araldite sections, which also revealed considerable degenerative changes in a few or more fibers. These were more clearly seen in ultrathin sections, especially in the lepromatous muscle specimens. The degeneration was in the form of severe loss or disorganization of the myofibrillar elements and in the most affected muscle fiber, a loss of all sarcoplasmic constituents, with occasional accumulation of lipofuscin in lysosome-like bodies. Only 3 of the lepromatous specimens showed 1 or 2 bacilli each, only 1 being within a muscle fiber. There were also mural changes in the small intramuscular blood vessels with proliferation of their basement membrane and pericytes. The mean serum IgG level in lepromatous patients was significantly elevated. This, together with the vascular change, might perhaps be responsible for the degenerative change in the muscle fiber despite a paucity of *M. leprae* in the muscle.

Authors' summary

DAVER, S.M.; DASTUR, D.K.; REVANKAR, C.R.; SHAH, J.S. Striated muscle in four categories of leprosy. I. Histology and histochemistry. *Int. J. Lepr.*, 48(2) : 140-148, 1980.

This histological and histochemical study of muscle in leprosy was carried out in view of the paucity of such studies despite the fact that leprosy is the single largest cause of motor deficit and paralysis. There were 21 patients who fell into 4 groups: those with very early non-lepromatous leprosy (group I, 7), untreated tuberculoid leprosy of long duration (group II, 2), untreated lepromatous leprosy (group III, 5), and treated lepromatous leprosy (group IV, 7). A normal histological and histochemical picture on paraffin and frozen sections stained for ATPase and succinic dehydrogenase (SDH) reactions was seen in group I. While groups II and III revealed muscle fiber atrophy and type preponderance, group III also showed degeneration of some fiber, inflammatory or necrotic reaction, and, histochemically, type

atrophy or grouping. The treated lepromatous group showed similar but milder and less frequent changes. Fite-Faracco stained paraffin sections showed acid-fast bacilli in and around blood vessels between muscle fiber in 2 specimens each of groups III and IV. In frozen sections stained for cholinesterase reaction, motor end-plates were well preserved in groups I and IV but appeared to be scanty in biopsies of group II and shrunken or expanded in group III. On the whole, lepromatous leprosy showed the maximum changes in and around muscle fibers, and there was fair clinico-pathologic correlation in all the groups.

Authors' summary

GUPTA, J.C.; GANDAGULE, V.N.; NIGAM, J.P.; GUPTA, D.K. A clinico-pathological study of laryngeal lesions in 30 cases of leprosy. *Lepr. India*, 52(4):557565, 1980.

The histological findings in laryngeal biopsies and local clinical findings in thirty cases of leprosy have been reported in detail. It is emphasised that in areas where there is significant incidence of leprosy, laryngeal involvement may be expected even in the absence of local clinical manifestations and be got confirmed by histological examination and demonstration of acid-fast bacilli. Further, histological appearance may not be very characteristic at the outset. The observations made by previous authors have been reviewed and discussed.

Authors' abstract

GUPTA, J.C. & PANDA, P.K. Amyloidosis in leprosy. *Lepr. India*, 52 (2) :260-266, 1980.

Fourteen hundred and forty five biopsied tissues of various organs including liver, skeletal muscle, kidney, lymphnode, larynx and skin from 1222 patients of leprosy obtained during the last 10 years have been examined histopathologically to study various types of pathological lesions. These patients ranged in age from 7 years to 72 years and the duration of illness varied from less than one year to twenty years. Although the presence of lepromatous granuloma, AFB in varying proportions, and some nonspecific lesions have been observed in them, but amyloidosis was not detected in any of them. This finding is discussed in view of the observations of other authors of different parts of the world in this connection. Consumption of mainly vegetarian diet in our population

and that of meat in Western population has been suggested to be the probable cause of the difference of amyloidosis observed in the two groups of people.

Authors' summary

KAUR, S.; MALIK, A.K.; KUMAR, B. Pathologic changes in striated muscles in leprosy. *Lepr. India*, 53(1):52-56, 1981.

Eighteen muscle biopsies from male adult patients of lepromatous and borderline lepromatous leprosy were studied. B1 in the biopsies ranged from 1+ to 3+. There was conspicuous absence of granuloma except for a collection of foamy histiocytes in intermysial region and on two occasions in the intermysial nerve endings in LL patients. At places solid staining bacilli were seen in normal looking muscles. None of the biopsies showed loss of muscle striations, fatty change, sarcolemmal changes, fibrosis and necrosis. Hyaline change was seen in two specimens only. Details of these are discussed in this paper.

Authors' abstract

KOTTEESWARAN, G.; CHACKO, C.J.G.; JOB, C.K. Skin adnexa in leprosy and their role in the dissemination of *M. leprae*. *Lepr. India*, 52(4):475-481, 1980.

Skin biopsies from twenty patients each of tuberculoid, borderline and lepromatous leprosy were studied with a view to find out the presence of bacilli in sweat glands, sebaceous glands, hair follicles and arrector pili muscles and also the pattern of destruction of these tissues by leprous granuloma. *M. leprae* are found in large numbers in sweat glands, sweat ducts, sebaceous glands, hair follicles and arrector pili muscles. Further in lepromatous leprosy the granulomas mainly surround the skin adnexa which atrophy due to pressure by the granuloma. However in tuberculoid leprosy the inflammatory cells infiltrate the adnexal tissues and destroy them. This study confirms that *M. leprae* are discharged and disseminated through sweat and sebaceous secretions and therefore infection through skin to skin contact can be one of the common modes of transmission of the disease.

Authors' abstract

KUMAR, B.; KAUR, S.; GEORGE, T.; CHAKRAVARTY, R.N.; GANGULY, N.B. Serum lipids in leprosy. *Lepr. India*, 52(3):433-439, 1980.

Sera of 58 patients of various types of leprosy were tested for total fat, phospholi-

pids, cholesterol and alpha and beta lipoproteins. Total fat and both fractions of lipoproteins were found to have values comparable to normals in all types of leprosy. Serum phospholipid levels were significantly reduced in LL type of leprosy as compared to normals and TT group of patients. Similarly cholesterol levels were found to have significantly no value in LL group compared to that of the controls.

Authors' summary

MAHADEVAN, P.R. & ANTIA, N.H. Biochemical alteration in cells following phagocytosis of *M. leprae* — The consequence a basic concept. *Int. J. Lepr.*, 48(2):167-171, 1980.

When macrophages from lepromatous leprosy patients are exposed to *M. leprae*, the macrophages show reduced protein synthesis. Such a phenomenon is not seen with macrophages from tuberculoid patients or normal individuals. *M. leprae* phagocytized by Schwann cells affect the incorporation of DNA precursor in the cells, leading to failure of Schwann cell association with axons in *in vitro* cultures. These 2 observations form a basis of proposing that basic biochemical events take place when *M. leprae* are associated with host cells, which in turn can be amplified to physiologically functional defects.

Authors' summary

MEHTA, L.; KASBEKAR, V.; APTE, N.; ANTIA, N.H. Evolution of nasal mucosal lesions in leprosy (histological study). *Lepr. India*, 53(1):11-16, 1981.

Four stages of nasal pathology in tuberculoid leprosy is described. In every atrophic rhinitis case nasal biopsy is advocated. Rhinoscopic examination should be done in family contacts and early cases of leprosy.

Authors' abstract

OKADA, S.; FUKUNISHI, Y.; MUKHERJEE, A.; RAMU, G.; DESIKAN, K.V. An improved embedding method for electron microscopy of lepromata. *Int. J. Lepr.*, 48(4):408-413, 1980.

Spurr's resin mixture has been found to be the embedding material most suitable for electron microscopic studies of lepromata at present. Like methacrylate, it can penetrate well into foamy structures and the leprosy bacilli within foamy structures. On the other hand, like Epon 812, it is stable against the

electron beam and can preserve ultrafine structures. Additionally, we have found that the use of dimethylformamide or dimethylsulfoxide instead of propylene oxide as substituter improves the preservation of the ultra- fine structures of leprosy bacilli.

#### Authors' summary

RIDLEY, D.S.; REA, T.H.; McADAM, K.P.W.J. The histology of erythema nodosum leprosum. Variant forms in New Guineans and other ethnic groups. *Lepr. Rev.*, 52(1) :65-78, 1981.

The histology of erythema nodosum leprosum (ENL) shows some distinctive variations, which were considered in relation to ethnic groups in Papua New Guinea, Malaysia, Mexico and a miscellaneous group of ENL patients. In highland patients of Papua New Guinea the reaction involved the connective tissues of the dermis more than the lepromatous granuloma, and the chief features were oedema and fibrinoid necrosis followed by very heavy fibrosis. Infiltration of neutrophils was a subsidiary finding. In Malaysia, some of the features of the necrotizing form of ENL, previously described, were detectable fairly regularly even in less severe non-necrotizing lesions. In Mexican patients who developed ENL rather than the Ludo form of reaction, the ENL was of the classic type and did not differ from the ENL seen in the miscellaneous group. ENL appears to be a complex of reactions whose form may perhaps be modified by ethnic factors as well as by the immune status within the spectrum.

#### Authors' summary

RIDLEY, M.J. The mononuclear cell series in leprosy: an ultrastructural report. *Lepr. Rev.*, 5.2(1)35-50, 1981.

Ultrastructural observations have been carried out on the mononuclear phagocytic series, the host cells of *Mycobacterium leprae*, throughout the spectrum of leprosy. The changes seen in these cells at various points in the immunological spectrum indicated differences ranging from the state of non-specific stimulation which occurs on the entry of *M. leprae* into the macrophage to the more specific activation which takes place in the presence of immune mechanisms. The most highly differentiated of the cell types was the epithelioid cell which appeared when hypersensitivity was maximal, in tuberculoid lesions and in positive Mitsuda skin tests. Cells described in the literature as 'A' type epithe-

lioid thought to be an immature epithelioid cell had much rough endoplasmic reticulum while 'B' type epithelioid cells thought to be an end cell had numerous smooth lined vesicles. Lepromatous leprosy was characterized by a small undifferentiated *immature* bacteria-laden macrophage. An intermediate cell stage was seen in BB leprosy. The cells of BB leprosy were activated macrophages with high phagocytic potential. All gradations in the proportion of endoplasmic reticulum to vesicles of macrophages, from the activated cell seen in BB to 'A' type epithelioid cells seen in low antingen, high resistance BT to mainly 'B' type cells in downgrading BT were encountered. This supported the continuous spectrum of macrophage development seen throughout the spectrum of leprosy.

#### Author's summary

RIDLEY, M.J. & RIDLEY, D.S. Histoid leprosy. An ultrastructural observation. *Int. J. Lepr.*, 48(2):135-139, 1980.

A young active histoid nodule from an untreated patient with lepromatous leprosy was examined by electron microscopy. The only area where spindle-shaped cells predominated was near the pseudocapsule, and these cells were the only ones that were associated with the presence of collagen. The main mass of the granuloma was composed of young macrophages which showed evidence of a higher cell turnover rate than in ordinary lepromatous leprosy. Among the macrophages were plasmacytoid cells. Histoid lesions are thought to be essentially hyperactive, but the nature of the stimulus is unknown.

#### Authors' summary

ROBINS, K.; VIJAYAKUMAR, T.; GOPINATH, T.; VASUDEVAN, D. M. Liver in leprosy. I. Funcional changes. *Lepr. India*, 52(3) :416-422, 1980.

Liver function tests were carried out in 79 leprosy patients, out of which 28 patients were being treated and 42 patients were not receiving any treatment. The rest 9 patients were clinically quiescent. In the untreated group there were 28 tuberculoid and 14 lepromatous cases. The 28 patients receiving treatment were composed of equal number of lepromatous and tuberculoid groups. The liver function tests of 10 of the untreated tuberculoid patients were repeated after six months of specific therapy with D.D.S. The values of liver function tests of these patients were compared with that of 20 normal adults.

lity observed in the patients were a reversal of albumin/globulins ratio which was more common in the lepromatous group than in the tuberculoid group. Treatment with D.D.S. has resulted in the reduction of the serum globulin. There were no changes in transaminases and alkaline phosphatase activities in the untreated patients. But however a rise in the above enzymes were observed in patients on treatment. The mean serum cholesterol values of the patients were lower than that of the controls.

Authors' summary

SAOJI, A.M.; JARIWALA, H.J.; KELKAR, S.S. Lactate dehydrogenase zymograms of skin biopsies in patients with leprosy. A preliminary report. *Int. J. Lepr.*, 48(4):426-430, 1980.

LDH isoenzymes were studied in tissue extracts of 78 cases of leprosy. All 25 control tissues showed five LDH isoenzymes corresponding to those of human sera. All tissues from the leprosy cases showed five similar bands. Seventeen cases showed additional LDH isoenzymes (anomalous bands). In 12 cases there was a single extra band with an eF value of either  $0.125 \pm 0.015$  or  $0.525 - 0.015$  and five cases showed both these bands. Additional bands were observed only in cases positive for acid-fast microorganisms (17 of 27 cases), and their presence correlated well

with bacterial load (as judged by the BI) and viable organisms (as judged by the MI). Four cases with a high BI and MI did not show anomalous bands, however. A plausible explanation for these bands is that they originate from viable *M. leprae*.

Authors' summary

SEYDEL, J.K.; RICHTER, M.; WEMPE, E. Mechanism of action of the folate blocker diaminodiphenylsulfone (dapsons, DDS) studied in *E. coli* cell-free enzyme extracts in comparison to sulfonamides (SA). *Int. J. Lepr.*, 48(1):18-29, 1980.

The antibacterial activity of DDS has been studied in whole cell (*E. coli*), cell-free folate synthesizing enzyme extracts and compared to effects obtained for sulfonamides (SA). It is shown that DDS acts as a synthetase inhibitor in the folate synthesizing enzyme system. DDS reacts with the substrate 7,8-dihydro-6-hydroxymethylpteropyrophosphate to form a 7,8-dihydroptericoic acid analog. Bacterial growth kinetic studies were performed to test for possible synergistic activity of the analog in combination with DDS. Possible reasons for the extremely large inhibitory power of DDS against *M. leprae* are discussed.

Authors' summary

## GENÉTICA

## GENETICS

SAOJI, A.M.; JARIWALA, H.J.; KELKAR, S.S. Haptoglobin phenotypes in leprosy. *Int. J. Lepr.*, 48(4):422-425, 1980.

Serum haptoglobin phenotypes were studied in 80 patients with leprosy classified according to the criteria of Ridley and Jopling. The distribution of phenotypes was: 2-2, 65%; 2-1, 27.5%; 1-1, 1.25%; and 0-0, 6.25%. This distribution was not significantly different

from the controls except for the phenotype 0-0 ( $p < 0.02$ ). Thus, although this genetic marker did not correlate with the occurrence of the variety of disease, it is possible that leprosy caused inhibition of haptoglobin synthesis and therefore an apparent increased frequency of the 0-0 phenotype. Evidence for such a secondary anhaptoalbuminemia was available in one case.

Authors' summary

## HANSENÍASE EXPERIMENTAL, LEPRO ANIMAL EXPERIMENTAL HANSENIASIS, ANIMAL LEPROSY

CHATTERJEE, B.R. Attempt to induce immune-tolerance to *M. leprae* in mice. *Lepr. India*, 53(1):34-37, 1981.

The thymectomised-irradiated mouse model of Rees provided an animal host for a

somewhat generalised and bacteriologically enhanced experimental lepromatous type of leprosy. However, the rather sophisticated equipment, animal laboratory set-up to house these highly susceptible-to-infection animals, and the problem of keeping them alive during

the experimental period by weekly infusion of bone marrow from normal mice makes it not only a very expensive proposition, but also a cumbersome business. To obviate these difficulties and to produce a relatively easy animal model with generalised leprosy, we tried immunological tolerance by injecting repeated and increasing doses of *M. leprae* antigen to pregnant mice to produce litters that would hopefully be tolerant to *M. leprae* when exposed to infection in adult life. The preliminary results reported here would indicate some enhancement of susceptibility to leprosy in the litters of the treated mice, though not a classical state of tolerance.

From the article

GANGULY, N.K.; KUMAR, B.; KAUR, S.; SHARMA, S.; KAUR, M.; CHAKRAVARTI, R.K. BCG induced immunity to *Mycobacterium leprae* in mice. *Lepr. India*, 53(1):57-62, 1981.

One to three BCG vaccinations were given to various groups of mice-25 to 2 days preceding challenge with *Myco. leprae*. Harvesting of *Myco. leprae* was done every month upto a period of 7 months. Lymph node enlargement was taken as an indicator of successful vaccination. An increasing degree of protection was noted in BCG immunised mice as observed by a reduced number of bacilli harvested. Protection afforded was proportional to the number of doses of BCG given.

Authors' abstract

KAZDA, J.; IRGENS, L.M.; MULLER, K. Isolation of non-cultivable acid-fast bacilli in sphagnum and moss vegetation by foot pad technique in mice. *Int. J. Lepr.*, 48(1):1-6, 1980.

In the former leprosy-endemic coastal area of Norway, 122 samples of sphagnum and moss vegetation were collected from 6 biotopes and examined for non-cultivable AFB by foot pad inoculation. Of the 759 foot pads examined, 20.9% contained noncultivable AFB. A significantly higher frequency was found in a habitat where *Sphagnum cuspidatum* was preponderant, the sphagnum species from which the maximum yield was obtained. The bacteria were polymorphous, solidly staining AFB, which multiplied in passage in foot pads while they could not be cultivated on the conventional media for mycobacteria. Efforts are continuing to identify these AFB by biochemical methods and by inoculation into nine-banded armadillos.

Authors' summary

LEFFORD, M.J. & LOGIE, P.S. Induction and suppression of cross-reactive antituberculosis immunity after *Mycobacterium leprae* infection of mice. *Infect. Immun.*, 31 (3):1023-1033, 1981.

Mice immunized with  $10^8$  live *Mycobacterium lepraemurium* in the footpad showed increased resistance to infection with BCG or *M. tuberculosis* R1Rv. This resistance could be transferred adoptively with lymphoid cells, signifying that the immunity was cross-reactive rather than nonspecific. Adoptive cross-reactive immunity to *M. tuberculosis* was also conferred by spleen cells from mice immunized with large doses of living or dead *M. lepraemurium* intravenously, a route of immunization that suppresses the induction of cell-mediated immunity to that organism. The presence of specific suppressor activity was sought in mice immunized intravenously with *M. lepraemurium*. It was found that mice preimmunized intravenously with living or dead *M. lepraemurium* and then infected with BCG did not confer levels of adoptive antituberculosis immunity as high as those conferred by mice immunized with BCG alone. Similarly, a mixture of BCG-sensitized and *M. lepraemurium*-sensitized cells did not convey as much immunity as BCG-sensitized cells alone, signifying suppression of the effector lymphocytes.

Authors' abstract

LEININGER, J.R.; DONHAM, K.J.; MEYERS, W.M. Leprosy in a chimpanzee. Postmortem lesions. *Int. J. Lepr.*, 48(4):414-421, 1980.

A young (5-7 year old) male chimpanzee died 33 months after the first clinical manifestations of a naturally acquired disease that was similar to disseminated leprosy in man. At autopsy there were diffuse or multifocal histiocytic infiltrations of the skin, nasal mucosa, pharynx, lung interstitium, liver, spleen, sclera, testicles, adrenal glands, and peripheral lymph nodes. Major nerves of the forearms had extensive fibrosis. There were large numbers of acid-fast bacilli (AFB), many occurring as globi, in histiocytes in most affected tissues including nerves. The histopathologic features of the disease and the microbiologic and antigenic properties of the AFB in the tissues indicate that *Mycobacterium leprae* or an organism indistinguishable from it was the causative agent. This and other cases of leprosy in nonhuman primates indicate that studies of the development of nonhuman primate models for leprosy may be worthwhile.

Authors' summary

LEVY, L. Activity of four clofazimine analogues against *Mycobacterium leprae*. *Lepr. Rev.*, 52(1) :23-26, 1981.

Four clofazimine analogues were found active against *Mycobacterium leprae* in the mouse footpad system, but none was as active as clofazimine itself. The results suggest the importance of the two pchlorosubstituents that are a structural feature of clofazimine.

Authors' summary

LOVIK, M. & CLOSS, O. Effect of BCG vaccination on *Mycobacterium lepraemurium* infection in a highly susceptible inbred mouse strain. *Acta Path. Microbiol. Scand. Sect. C*, 89(2):133-138, 1981.

Upon infection with *Mycobacterium lepraemurium* (MLM) C3H mice develop a disease that has features in common with lepromatous leprosy in man. Intraperitoneal vaccination with a single dose of BCG four weeks before inoculation with MLM in the footpad significantly reduced the total bacillary load of the animals. In vaccinated animals there was a delay in the dissemination of bacilli to the popliteal lymph node, liver, and spleen. The growth rate of MLM in the footpad and the popliteal lymph node was not altered by BCG vaccination. Reduced dissemination of the bacilli seems to be a sensitive parameter of resistance in murine leprosy. The mechanism of the resistance observed is discussed mainly in relation to non-specific macrophage activation and T-cell mediated responses to cross-reactive antigens.

Authors' abstract

PATTYN, S.R. & PORTAELS, F. In vitro cultivation and characterization of *Mycobacterium lepraemurium*. *Int. J. Lepr.*, 48(1):7-14, 1980.

Three different strains of *M. lm* were regularly grown in vitro from suspensions of mouse organs if at least  $10^5$  organisms were inoculated on Ogawa egg yolk medium and incubated at 35°C in a humidified, CO<sub>2</sub> enriched atmosphere. Growth is slow and requires 2-3 months. Colonies are 1-2 mm in diameter, white to pale yellow. Microscopically the bacteria are acid-alcohol-fast pleomorphic rods with branchings and beaded filamentous forms. Mice inoculated with in vitro grown subcultures develop and infection indistinguishable from the one observed after injection with mouse passage strains of *M. lm*. The in vitro characteristics of the strains are identical and different from all other known mycobacteria.

Authors' summary

SENGUPTA, U. & NAKAMURA, M. Growth of *Mycobacterium lepraemurium* in cell-free liquid medium containing soluble starch: evaluation by generation time and morphological observation. *Lepr. India*, 53(1):23-28, 1981.

A stimulatory effect of soluble starch on the growth of *M. lepraemurium* in vitro cell-free culture system has been noted. In this medium bacteria elongated gradually without manifesting any significant peak in elongation as has been noted in NC-5 medium. The maximum average elongation of bacteria was 2.84 p. on the 24th day in NCS-5 medium. In contrast, in NC-5 bacteria elongated maximum on the 6th day (2,32g). All the stages of bacterial cell division were noted. Hypothesis has been suggested for continuous multiplication of *M. lepraemurium* in NCS-6 medium.

Authors' abstract

SENGUPTA, U. & NAKAMURA, M. A relationship between the length of bacilli and the log phase of growth of *Mycobacterium lepraemurium* in cell-free liquid medium. *Lepr. India*, 53(1) :29-33, 1981.

A relationship between the early phase of growth of *M. lepraemurium* in vitro in NC-5/ND-5 media and elongation of bacteria has been noted. The doubling time in NC-5 is 3.06 days whereas it is 1.97 days in ND-5 medium. In ND-5 medium, *M. lepraemurium* elongates earlier to that in NC-5. Furthermore, in ND-5 the peaks in elongation of bacteria are more frequently noted than in NC-5 medium. Morphological observations have shown all stages of bacterial cell-division. At later stages of cultivation (21st and 24th day) *M. lepraemurium* often shows terminal swelling in ND-5 medium which also revealed stages of cell-division.

Authors' abstract

SHEPARD, C.C.; MINAGAWA, F.; VAN LANDINGHAM, R.; WALKER, L.L. Foot pad enlargement as a measure of induced immunity to *Mycobacterium leprae*. *Int. J. Lepr.*, 48(4) :371-381, 1980.

Foot pad enlargement (FPE) has been used as a measure of induced immunity to *M. leprae*. FPE peaked at 2-3 days, but it sometimes persisted for 4 weeks or more. Both as the inducing and eliciting antigen, heat-killed *M. leprae* were effective, and the optimum dose was about  $1 \times 10^7$  bacilli. Higher doses were associated with flattening of the dose-response curve. Disrupted bacilli were not effective in immunizing mice, but

they elicited FPE responses in mice immunized with intact bacilli. Cord factor was not found to have adjuvant activity for *M. leprae*. In immunization, the intradermal route was confirmed to be more effective than the foot pad route; the subcutaneous route was effective in providing protection against infection.

FPE tests were used to investigate the steps of standard purification procedures for 131. *leprae* in armadillo livers. A trypsin-chymotrypsin digestion step was found to be harmful to immunogenicity in one of two experiments.

Authors' summary

## CLÍNICA, DIAGNÓSTICO CLINICAL ASPECTS, DIAGNOSIS

BRANDT, F.; MALLA, O.K.; ANTEN, J.G.F.  
Influence of untreated chronic plastic iridocyclitis on intraocular pressure in leprosy patients. *Brit. J. Ophthalmol.*, 65(4):240-242, 1981.

The intraocular pressures of a total of 1015 eyes of leprosy patients who never had ophthalmological care or local eye treatment were measured. The patients were categorised according to the type of leprosy they had and the eyes were categorised as without or with chronic plastic iridocyclitis. In patients with the tuberculoid and lepromatous types of leprosy the intraocular pressure was significantly lower in eyes with chronic plastic iridocyclitis than in unaffected eyes. It has been shown that chronic plastic iridocyclitis which remains untreated for many years results in significantly lower intraocular pressure.

Authors' summary

DEBI, B.P.; MOHANTY, H.C.; TRIPATHY, N.; TOMPE, D.B.S.; SARANGI, B.B.  
Arteriographic pattern of plantar ulcers in lepromatous leprosy: study of 20 cases. *Lepr. India*, 52(3):429-432, 1980.

Sixty arteriograms were done in twenty cases of lepromatous leprosy with thirty five plantar ulcers of six months to two years duration. Tortuosity, narrowing and obliteration of vascular lumen was mostly observed. Obliteration of vascular lumen was seen in twenty five percent of cases. Arteriographic findings were directly proportional with age of patient and duration of ulcer. Hyperemia and neovascularisation were seen in active and infected ulcers. Advanced vascular changes were associated with osteolytic changes of the bone along with neurological deficit.

Authors' summary

FFYTCHÉ, T.J. Role of iris change as a cause of blindness in lepromatous leprosy. *Brit. J. Ophthalmol.*, 65(4):231-239, 1981.

Clinical and pathological investigations in a group of 113 patients with leprosy of

long duration demonstrated the importance of iris changes as a cause of blindness. In lepromatous leprosy the so called 'chronic iritis' produces iris atrophy with small nonreacting pupils which exaggerate the visual impairment created by developing lens changes and corneal opacities. The cause of this 'chronic iritis' is believed to be neuroparalytic from early involvement of the small nerves of the iris, particularly the autonomic supply. Clinical and pharmacological evidence for this theory is supported by the histological changes observed in 18 specimens of iris removed during the course of cataract surgery, with progressive atrophy of the iris preferentially affecting the dilator muscle and leading to a nonreacting miotic pupil. Further pharmacological and histological studies are to be undertaken on lepromatous patients with iris involvement with a view to establishing possible methods of prevention.

Author's summary

KAUR, S.; KUMAR, B.; DARSHAN, H. Choice of sites for study of slit skin smears. *Lepr. Rev.*, 52(1):27-33, 1981.

In view of recent publications drawing attention to the importance of fingers and toes as sites for slit skin smears in leprosy, a study has been carried out on patients in India to compare the bacterial load and morphology of bacilli at various sites in both treated and untreated lepromatous patients. Although the ear lobes gave maximum bacteriological and morphological indices in most instances, a few cases gave higher values at elbows, fingers and toes. In three patients, bacilli could be detected only from sites other than ear lobes. The importance of taking slit skin smears from peripheral sites, including fingers and toes, is stressed.

Authors' summary

KAUR, S.; KUMAR, B.; DARSHAN, H.; SINGH, S. Choice of skin slit smears for study of bacterial and morphological indices. *Lepr. India*, 52(4):540-547, 1980.

Skin slit smears of 46 patients of lepromatous leprosy (16 untreated, 30 long treated) were studied from ear lobules, fingers, elbows and knees. In untreated patients ear lobules gave highest BI, as compared to other sites. MI from ear lobules was higher than elbows and knees but slightly lower than that from fingers. In treated patients sites other than ear lobules yielded solid staining bacilli more frequently. Multiple sites and especially peripheral sites are recommended for study of skin slit smears to discover persistent bacilli.

Authors' abstract

KRISHNA MURTHY, K. & RAJA BABU, K. Toxic psychosis after accidental ingestion of dapsone — review and case report. *Lepr. India*, 52(3):443-445, 1980.

A case of toxic delirious psychosis in a 5 year old child after accidental ingestion of dapsone is reported and relevant literature is reviewed. A suggestion is made for a detailed work on the pathological and metabolic effects of dapsone on central nervous system.

Authors' summary

KUMAR, B.; SINGH, S.; KAUR, S. Jaundice occurring as a complication of erythema nodosum leprosum (a report of two cases). *Lepr. India*, 52(4):586-590, 1980.

Two patients of lepromatous leprosy who developed jaundice during the erythema nodosum leprosum are reported here. There was slight enlargement of the liver and transient change in liver functions during the acute phase, which subsided after subsidence of reaction. Histopathology and other details are described.

Authors' abstract

KUMAR, J.H.R. & VERGHESE, A. Psychiatric disturbances among leprosy patients. An epidemiological study. *Lepr. Rev.*, 48(4):431-434, 1980.

An epidemiological study was done to determine the prevalence of psychiatric disturbances among leprosy patients. Using a stratified random sampling technique, 540 subjects with leprosy were selected from a total population of 5745 leprosy patients. A mental health evaluation was conducted on 494 of these subjects. Forty-nine of these patients were found to have a psychiatric disturbance, giving a prevalence rate of about 99 per 1000. Depressive reaction was the most common disturbance seen. Those patients who were sick for a longer time and those who developed physical deformities were found to be more prone to get psychiatric disturbances. It is emphasized that supportive psychotherapy is important in the management and rehabilitation of leprosy patients.

Authors' summary

MUKHERJEE, A.; GIRDHAR, B.K.; DESIKAN, K.V. Leprous phlebitis. *Int. J. Lepr.*, 48(1):48-50, 1980.

Six cases of phlebitis of leprosy origin affecting the superficial veins have been recorded. This lesion does not seem to be as rare as was previously believed. The clinical and histopathological details of these cases are presented.

Authors' summary

SMITH, W.C.S. Tetanus infection in patients with leprosy. *Lepr. India*, 52(4):536-539, 1980.

The incidence of death from tetanus in leprosy patients has been compared with the general population. It appears that tetanus occurs less often among leprosy patients. The pathogenesis and the consequences of this are discussed.

Author's abstract

## TERAPÊUTICA THERAPY

BALAKRISHNAN, S. & SESHADRI, P.S. Drug interactions — the influence of rifampicin and clofazimine on the urinary excretion of DDS. *Lepr. India*, 53(1):17-22, 1981.

Indication of an enhancing effect of Rifampicin on the urinary excretion of DDS

has already been reported from this Institution. Further observations on this aspect in 25 cases of lepromatous leprosy treated with a 15 day schedule of Rifampicin at a dose of 600 mg daily along with DDS are presented. The earlier findings that Rifampicin in the initial phase of administration enhance the urinary output of DDS are confirmed.

An estimation of Rifampicin Creatinine levels in urine done concurrently also showed a quicker elimination of the drug in the earlier phase compared to later phases of the drug administration. As part of the study of drug interactions, the influence of Clofazimine administration on DDS metabolism was also studied. The findings indicate that Clofazimine does not exert any influence on DDS excretion by leprosy patients. The findings and their implications are discussed.

## Authors' abstract

DUTTA, R.K. Clofazimine and dapsone — a combination therapy in erythema nodosum leprosum syndrome. *Lepr. India*, 52 (2) :252-259, 1980.

Clofazimine and Dapsone combination is an effective regimen for the treatment of ENL patients. The regimen not only controls the reaction but also promotes concurrent bacteriological improvement. The drugs are well tolerated and free from adverse effect in the doses used in this study.

## Author's conclusion

HUIKESHOVEN, H.; WIT, M.; SOETERS, A.; LANDHEER, J.E.; LEIKER, D.L. ELISA inhibition technique for the demonstration of sulphones in body fluids. *Lepr. Rev.*, 52(1) :11-18, 1981.

An enzyme-linked immunosorbent assay (ELISA) for sulphones in urine is described.

This method for monitoring dapsone (DDS) self-administration is compared with the quantitative determination of DDS/creatinine (D/C) ratios, currently used. Urine samples collected from 10 volunteers on 14 consecutive days after taking single doses of 100 mg DDS are studied, together with pretreatment samples and urine containing standard amounts of DDS. The lowest quantity of DDS still visually detectable by ELISA inhibition is 0.01 pg/ml urine. All samples obtained up to 4-10 days after the 100 mg DDS doses are positive by this method, whereas the first negative D/C results occur on the third day. The method is especially apt to monitor substantial failure in DDS self-administration without using sophisticated instruments.

## Authors' summary

MENEZES, S.; REGE, V.L.; SEHGAL, V.N. Dapsone haemolysis in leprosy: a preliminary report. *Lepr. India*, 53(1): 63-69, 1981.

Fifty one patients with leprosy from the Urban Leprosy Centre, attached to the Department of Dermatology and Venereology, Goa Medical College on treatment with Dapsone were studied from the point of view of development of haemolysis related to the drug. The findings are described and discussed. Anaemia developed in 60.7 percent of the patients during the course of treatment. It was mild and well compensated. The haemolytic effect of dapsone was related to the dose and duration of the treatment, being more manifested in doses above 50 mg daily.

## Authors' abstract

THEOPHILUS, S. Treatment with thalidomide in steroid dependency and neuritis. *Lepr. India*, 52(3) :423-428, 1980.

Thalidomide is found effective and useful in cases of lepromatous ENL in corticosteroid dependant cases which had been on treatment with dapsone and lamprene. But eventually due to recurrence these cases had to be put back on steroids because of easier availability. Cases of neuritis responded much more satisfactorily and there was no change in the muscle deficit before or after treatment with thalidomide.

## Author's summary

VENKATESAN, K.; BHARADWAJ, V.P.; RAMU, G.; DESIKAN, K.V. Study on drug interactions. *Lepr. India*, 52(2): 229-235, 1980.

Studies on the interactions of the drugs used in combination therapy of leprosy were attempted at the Central JALMA Institute for Leprosy. INH supplementation with clofazimine, therapy appeared to lower the skin levels of clofazimine, raising the plasma and urinary content of clofazimine. Concurrent administration of clofazimine with DDS does not appear to exert any influence on the excretion of DDS. The plasma DDS lowering effect of Rifampicin does not vary between fast and slow acetylators for DDS.

## Authors' summary

CIRURGIA, FISIOTERAPIA, REABILITAÇÃO FÍSICA  
SURGERY, PHYSIOTHERAPY, PHYSICAL REHABILITATION

FFYTCHÉ, T.J. Cataract surgery in the management of the late complications of lepromatous leprosy in South Korea. *Brit. J. Ophthalmol.*, 65(4):243-248, 1981.

Clinical examination of 113 patients in South Korea with lepromatous leprosy and severe visual impairment showed that the main cause of visual loss was the combined effect of corneal and lens opacities associated

with small nonreacting pupils and iris atrophy. Cataract surgery with broad iridectomy and inferior sphincterotomy offers these patients with chronic lepromatous complications the best chance of preserving vision. Eighty-one cataract operations were performed under local anaesthesia, and in 90% vision improved; in 60% this improvement was 2 Snellen's lines or more.

Author's summary

EPIDEMIOLOGIA, PREVENÇÃO  
EPIDEMIOLOGY, CONTROL

GUHA, P.K.; PANDEY, S.S.; SINGH, G.; KAUR, P. Age of onset of leprosy. *Lepr. India*, 58(1):83-87, 1981.

Age of onset of leprosy is merely a subjective information based upon the memory, intelligent appreciation and awareness of the patient and his relatives, in absence of a more reliable method. In the present study, a modification of the conventional method which we named "Complemented recall" method was adopted to determine the age of onset of 400 leprosy patients, in an attempt to collect a better approximate data. The mean age of onset according to the disease type and its percent-wise break up in different age groups in other Indian series reported earlier has been compared.

Authors' abstract

LECHAT, M.F.; MISSON, C.B.; WALTER, J.; SEAL, K.S.; SANSARRICQ, H. An information system for leprosy control (OMSLEP recording and reporting system). *Int. J. Lepr.*, 48(1):51-61, 1980.

This study reports the various steps involved in the design of a simplified infor-

mation system for leprosy (OMSLEP), developed in cooperation between the Unit of Epidemiology, University of Louvain, Belgium, and WHO. The objective of the system is to permit the evaluation of a) the efficiency of programs within the context of established strategies and norms; b) the effectiveness of leprosy control methods from an epidemiological point of view; c) the efficacy and productivity of certain program components. Prior to designing the system, the relevant epidemiological and operational indices have been reviewed. A survey was also made of the forms used by some 78 leprosy control schemes throughout the world in order to analyze the current information now being collected. The proposed system is described. It includes an individual record form to be filled at registration and once yearly in subsequent years of follow-up, a detection form, and an annual statistics form for the tabulation of total patients. The system is presently being tested in some 15 countries.

Authors' summary