

LITERATURA CORRENTE

CURRENT LITERATURE

ANATOMIA - ANATOMY

BEINE, A.O. Modification of the "Wrap Around" tendon anastomosis of fascia lata graft with a slim double tendon of palmaris longus. *Indian J. Lepr.*, v.71, n.3, p.337, 1999.

A modification of Brand's "wrap around" technique of anastomosis is described, which allows joining a double 1 tendon or split tendon of palmaris longus to fascia lata graft, when one of the slim tendons would not allow performance of the Brand tendon anastomosis. Four such cases have been done successfully.

CLÍNICA - CLINICS

EBENSO, B.E. Genital nodules and testicular hydrocele in a case of relapsed lepromatous Leprosy. *Lepr. Rev.*, v.71, n. 1, p.81, 2000.

A borderline-lepromatous leprosy patient treated initially with dapsone monotherapy for 10 years followed by a combination of dapsone and clofazimine for 6 months stopped anti-leprosy treatment in 1991. He presented 6 years later due to new, widespread nodules, and recurrent testicular hydrocele. He responded to WHO-MB-MDT and steroid therapy. His hydrocele was treated surgically. The co-existence of recurrent testicular hydrocele with genital nodules in relapsed LL led to this report.

GÓMEZ ECHEVARRIA, J.R., OCHOA, V.G., ORIVE, M.O.D. Manifestaciones radiológicas en enfermos de Lepra inactivos clínica y bacteriológicamente hace más de 10 años. *Fontilles-Rev. Lepr.*, v.22, n.3, p.241, 1999.

A study of the radiological files of the Sanatorium of Fontilles was carried out to evaluate the radiological manifestations of the leprosy patients.

Since the bones in this disease are fundamentally affected at the distal parts of the upper and lower extremities. The radiographies of hand, feet and legs of 60 leprosy patients were reviewed. All these patients were clinically and bacteriologically inactive for a minimum of 10 years.

The radiographies belonged to 36 males and 24 females all between 55-81 years.

48 cases were multibacillary and 12 paucibacillary.

INDIRA, D., KAUR, I., SHARMA, V.K. et al. Palmoplantar lesions in Leprosy. *Indian J. Lepr.*, v.71, n.2, p.167, 1999.

Palms and soles are considered immune to leprosy. A study was carried out to assess the frequency of lesions over palms and soles and to correlate their occurrence with various parameters. Two hundred eighty leprosy patients were screened for lesions over palms and soles. Palmo-plantar lesions were observed in 10% of the patients screened. Slit-skin smears and biopsies were done from routine sites and palmo-plantar lesions.

Histopathology and slit-skin smear confirmed the presence of disease. Eight were in type 1 reaction, and 50% of patients with type 1 reaction screened showed lesions over palms and / or soles. The reason for this is not known; probably inapparent lesions become apparent during reactions. Lesions of various morphology were observed. Silky hand was observed in one case.

LIWEN, D., FUTIAN, L., JUAN, J. et al. Techniques for covering soft tissue defects resulting from plantar ulcers in leprosy: Part II - First toe web and dorsal foot flaps. *Indian J. Lepr.*, v.71, n.3, p.297, 1999.

The first toe web flap consists of the skin and subcutaneous tissues of the contiguous sides between the great and second toes. It is based on the first dorsal metatarsal artery or the common plantar digital artery. This flap was used as artery pedicled island graft to reconstruct losses of skin and soft tissue cushion in the ball of the foot in the first and second metatarsal head region in 16 cases. Follow-up examination revealed that ulceration had recurred in one case due to dehiscence of the flap margin 12 months post-operatively. The other 15 patients have done well without recurrence at 48 to 124 months follow-up examination.

The dorsal flap of the foot based on the dorsalis pedis artery, the corresponding veins and the deep peroneal nerve was designed in 1974 to resurface skin and soft tissue defects in the sole of the foot. This flap was used in 30 cases of leprosy with excellent results. During

follow-up 36 to 120 months after surgery the plantar ulcer had recurred in only one case.

All the others have done well. The long-term curative effect has thus proved satisfactory.

LIWEN, D., FUTIAN, L., ZAIMING, W. et al. Techniques for covering soft tissue defects resulting from plantar ulcers in leprosy: Part I - General considerations and summary of results. **Indian J. Lepr.**, v.71, n.3, p.285, 1999.

Recurrent plantar ulceration is a common and serious complication occurring consequent to impairment of the tibial nerve in leprosy patients. In spite of many therapies and long therapeutic course, it is extremely difficult to abolish this complication in many cases because of extensive skin and soft tissue cushion loss due to repeated infection. Since the early 70's we have been using microscopic surgical techniques to reconstruct the ulcerated area using eight types of the flaps. In this series of papers we review our experience (76 patients). Post-operatively, the flaps survived in all cases, the long-term results have proved satisfactory, and recurrent ulceration occurred in only three patients.

MANANDHAR, R., LEMASTER, J.W., BUTLIN, C.R, et al. Interferon-gamma responses to candidate Leprosy skin-test detect exposure to Leprosy in a endemic population, **Int. J. Lepr.**, v.68, n. 1, p.40, 2000.

New tools for the detection of leprosy exposure in a community will be necessary for the eradication of leprosy. Candidate leprosy skin-test antigens derived from the fractionation of the leprosy bacillus into cytoplasmic and cell-wall proteins free of immuno-inhibitory mycobacterial lipoglycans and carbohydrates were used in an overnight blood test to determine whether exposure to leprosy can be detected by the production of the cytokine interferon gamma (IFN- γ).

Strong IFN- γ responses were detected in leprosy contacts to both skin-test antigens compared with control subjects from the same endemic communities. There was little response in patients with tuberculosis.

Responses were greatest in contacts with recent leprosy exposure. The implications of these findings for the application of these reagents in a field trial as skin tests to detect exposure to leprosy are discussed in light of the strong association between overnight IFN- γ to PPD and the tuberculin skin-test responses previously reported.

MASIH, V.K., GANDHI, B.S., REDDY, B.N. Can general practitioners carry out drug delivery and periodic examination of Leprosy patients in Raipur city? **Indian J. Lepr.**, v.70, suppl, P. 5s, 1998.

An intervention study to improve the MDT coverage of leprosy patients by involving general practitioners (GPs) was carried out in Raipur city. Most of the GPs (84%) were willing to undertake drug delivery and periodic examination of the leprosy patients. After involving GPs, the proportion of the patients registered for treatment increased from 33% to 89.2%. The cohort regularity was 57% only which was lower than that found in the Upgraded Urban Leprosy Centre. Drug compliance as found out by the pill count was 91%. Most of the patients (87%) were happy with the services provided by the GPs.

MATHEW, J., ANTONY, P, ETHIRAJ, T. et al. Management of simple plantar ulcers by home based self-care. **Indian J. Lepr.**, v.71, n.2, p.173, 1999.

Seeking a solution to bring down the prevalence of simple plantar ulcers in the field, Damien Foundation India Trust (DFIT), Chennai, developed a curriculum to teach the field staff of all its projects. The purpose was to make patients self-reliant in the care of their plantar ulcers in their homes. The strategy used was to make patients take care of their ulcers using tools found in their homes and surroundings and become responsible for the care of their limbs. This strategy was implemented in eight projects of DFIT and the programme was followed regularly for one year. Regular monitoring and evaluation showed that under this strategy the prevalence of plantar ulcers was reduced by about 50%.

RAMESH, V.K., MANI, R., PARKASH, I. A study of low clinic attendance of leprosy patients: reasons and solutions. **Indian J. Lepr.**, v.70, p.17s, 1998. Supplement.

In this study, the effect of health education on a sample of 325 absentee leprosy patients was assessed in a leprosy endemic area. About 46% of the absentees from the study group returned to the clinic following health education (HE). HE was more effective amongst those who defaulted in the later part of their treatment sessions. Monthly attendance rate increased from 70% - 74% to 72% - 91% following HE. Amongst the absentees, 58% were absent due to personal reasons and 8% due to health service related reasons. Personal reasons was the commonest cause for absenting at second pulse. At third pulse it was due to socio-economic reasons. At fourth pulse it was due to service-related reasons. At fifth pulse

the commonest reason was disease-related. Health education had proved to be a definite solution to solve the absentee problem.

RAO, P.S.S.S., AUGUSTINE, V., JOSEPH, G.A. Being a female leprosy patient in South India. **Indian J. Lepr.**, v.7, n.3, p.279, 1999.

The problems of women patients as revealed by a case study of a woman patient and a questionnaire study of 100 leprosy patients (47 men and 53 women) are presented. These include, besides general ones like ignorance of facts about the disease, specific ones like lack of privacy during clinical examination, indifference towards women's feelings and difficulties in communicating with male workers. A greater sensibility towards the sentiments and problems of women patients, on the part of the health service is required to amend the situation. Recruiting more women workers might help in this regard.

RODRÍGUEZ, Gerzaín, BERRIO, Joaquin, SARMIENTO, Ladys. La lepra y el riñón / Leprosy and the kidneys. **Biomédica** (Bogotá), v.19, n. 1, p.45-55, mar. 1999.

Revisamos los efectos causados por la lepra sobre riñón, los cuales no se deben a la presencia del bacilo en los nervios o en parenquima renal, sino fenómenos secundarios, tales como formación de complejos inmunes, precipitación de proteínas resultantes de la inflamación crónica o complicaciones de la terapia antileprosa, principalmente. Se incluye : a) defectos en la concentración y acidificación de la orina, b) nefritis intersticial aguda o crónica, c) insuficiencia renal aguda, d) amiloidosis sistémica secundaria, e) glomerulonefritis. Se analizan los mecanismos por los cuales se producen estas lesiones y se describen las circunstancias documentadas sobre la lepra y trasplante renal. La lepra no es una contraindicación para este trasplante porque si bien se requiere de inmunosupresión, la enfermedad puede no reactivarse y si lo hace, se controla con la poliquimioterapia disponible. La lesión renal en la lepra predomina en los enfermos multibacilares y en la reacciones de tipo 2 o eritema nodoso leproso. En general es silenciosa, crónica y puede llegar a ser causa de muerte en estos enfermos. Se detecta con facilidad con el simple examen parcial de orina, que revela albuminuria, cilindruria y hematuria. Este examen debe hacerse en todo paciente con lepra y debe tener carácter obligatorio en la reacción tipo 2, en la cual, junto con los síntomas cutáneos, neuríticos y oculares, se presenta algún grado de compromiso renal, en el 100 por ciento de las reacciones. El compromiso renal que la lepra produce en

los enfermos colombianos, se ha relegado a un segundo plano ante las manifestaciones dermatológicas. Se ha documentado amiloidosis secundaria sistémica y glomerulonefritis por depósito de complejos inmunes (AU).

SELVASEKAR, A., EBENEZER, G.J., PARTHEEBARAJAN, M. Lepromatous lymphadenopathy and concomitant tuberculous axillary lymphadenitis with sinus. A case reports. **Lepr. Rev.**, v.70, n.3, p.345, 1999.

A 25-year-old male patient with florid lepromatous leprosy presented with right axillary lymphadenopathy and a discharging sinus. He also had scabies with chronic right otitis media. Histopathological examination of the lymph node revealed lepromatous lymphadenitis coexisting with tuberculosis. This unusual combination of two different clinical entities is recorded in this case report.

SHARMA, A., SHARMA, V.K., RAJWANSHI, A. et al. Presence of *M. Ieprae* in tissues in slit skin smear negative multibacillary (MB) patients after WHO-MBR. **Lepr. Rev.**, v.70, n.3, p.281, 1999.

This study looked for *M. leprae* in the lymph node, nerve and skin of multibacillary (MB) leprosy patients who become slit skin smear negative after the completion of WHO-MBR. Twenty-five WHO-MBR-treated multibacillary leprosy patients were studied; borderline lepromatous (BL) leprosy (n=11) and lepromatous (LL) leprosy (n=14). Fifteen patients had reaction (erythema nodosum leprosum 11, upgrating reaction 4) either at presentation or during therapy. All patients attained slit skin smear negativity after WHO-MBR (range 24-39 months). Sixteen (64%) patients with multibacillary leprosy showed fragmented bacilli in skin and nerve biopsy or lymph node aspirates after WHO-MBR. Lymph node aspirates alone revealed *M. leprae* in seven patients, followed by nerve in two and skin in one patient. Four cases showed *M. Ieprae* at all sites followed by nerve and skin or lymph node in one case each. A pretreatment bacteriological index (BI) of 4+ or more was significantly associated with the presence of *M. leprae* at the end of treatment. Also, significantly more lymph node aspirates contained *M. leprae* in comparison with nerve or skin biopsies. All seven cases in whom treatment was extended beyond 24 months showed *M. leprae* in tissues even after attaining slit smear negativity. In conclusion, *M. leprae* persist in tissues after 2 years of WHO-MBR and patients with an initial BI of 4+ or more need closely followed up after stopping MDT.

THAPPA, D.M., KUMAR, R.H., KARTHIKEYAN et al. Scrotal lesions in lepromatous Leprosy. Indian J. Lepr., v.71, n.2, p.223, 1999.

Lepromatous leprosy is known to cause widespread infection of the body and skin due to haematogenous dissemination of the organisms. Moreover, it is known that *Mycobacterium leprae* has a distinct predilection for the cooler areas of the body, consequently a heavier dermal infiltrate occurs in cooler areas of the body than in regions closer to core temperature (Sahni et al 1982). Warmer areas such as the groin, perineum, scalp, axilla and the narrow zone of lumbosacral areas are, therefore, considered to be "immune zones" in leprosy (Kaur & Kumar 1978). However, the concept of "immune zones" has been questioned by a number of authors (Anish 1978, Arora et al 1989, Dixit et al 1990, Parikh et al 1989).

Clinical involvement of the scrotal skin (one of the immune areas) has been reported in indeterminate leprosy (Madava Murthy et al 1993), tuberculoid leprosy (Dixit et al 1990) and borderline leprosy (Sahni et al 1982, Arora et al 1989, Parikh et al 1989, Kachhawa et al 1993).

Histopathological and bacteriological involvement of scrotal skin in lepromatous leprosy has also been documented (Pandya & Antia 1974, Ramu & Desikan 1979), but clinical involvement has rarely been reported in the literature. This has prompted us to report such a case.

DIAGNÓSTICO - DIAGNOSIS

PENNINI, S.N., PEDROSA, L., REBELLO, P.F.B. Early diagnosis and treatment of Leprosy in intradomiciliary contacts in a high prevalence area: Amazon Region. Indian J. Lepr., v.71. p.73s, 1998. Supplement.

The importance of dermato-neurological examination of intradomiciliary contacts is well known as an important secondary preventive measure in leprosy control, due to the fact that it allows early diagnosis and treatment. This is an intervention trial in an area of high leprosy prevalence (Manaus/Brazil) where the proportion of contacts examined is low. The aim of the study is to assess whether a simple educational session conducted among patients increases contacts examination and leads to early case detection. The intervention group had examined more contacts ($p < 0.05$) but, paradoxically, presented fewer new cases than the control group. The authors discuss the probable causes for this unexpected outcome, the advantages of the intervention and other related issues.

SAUNDERSON, P., GROENEN, G. Which physical signs help most in the diagnosis of Leprosy? A proposal based on experience in the AMFES project, ALERT, Ethiopia. Lepr. Rev., v.71, n. 1, p.34, 2000.

As integration of leprosy control programmes proceeds, general health staff will have responsibility for the diagnosis of most new cases of leprosy. The training required by these workers has not yet been set out in detail. In this paper the criteria for making the diagnosis of leprosy in the AMFES cohort of 594 new cases are examined. Since this study does not include details of suspects in whom leprosy was excluded on clinical grounds, true sensitivity and specificity values cannot be calculated, but the positive predictive value of the diagnostic criteria can be measured. Sensory loss in a typical skin patch is the most important sign of early leprosy, but was not present in 132 (49%) of the 268 cases with a positive skin smear.

Thickening of the ulnar nerve is a valuable sign of leprosy in Ethiopia. It can be taught to health workers, who can practise by examining their own ulnar nerves. It is more likely to be present than nerve function impairment and is particularly important when skin smears are difficult to do or are unreliable. We recommend that five basic signs are used, the presence of any two being diagnostic of leprosy.

SHUMIN, C., CUNLIAN, H., BING, L. et al. A survey on knowledge and skills in the early diagnosis of Leprosy in general health services at different levels in Shandong province, The People's Republic of China. Lepr. Rev., v.71, n. 1, p.57, 2000.

In the late phase of a leprosy control programme, problems arise with regard to the early detection and treatment of a small number of new incident cases.

We describe a study in the province of Shandong, People's Republic of China, on the knowledge and skills regarding leprosy of general health service staff, including rural doctors, paramedical doctors at township level, doctors from county general and provincial hospitals and dermatologists. The results showed that there is a continuing need for suitable training programmes for medical staff in the general health services. Most dermatologists had good levels of knowledge and skills and more than 80% of new cases have been diagnosed in skin clinics in this province since 1990. Their participation in early diagnosis and training of staff should be strengthened.

EPIDEMIOLOGIA e CONTROLE EPIDEMIOLOGY and CONTROL

CHEN, X.S., LI, W.Z., JIANG, C. et al. Computerization of leprosy records: national leprosy recording and reporting system in China. **Lepr. Rev.**, v.71, n. 1, p.47, 2000.

This paper describes the national system of leprosy recording and reporting in China and the computerization of records. The system was designed for data collection at local level and data entry by optically scanned or manual mode as well as for sophisticated data analysis. The major functions include data entry, data check, sum-up, maintenance, communication, inquiry, statistics, graph and print.

A total of 17 options for epidemiological and clinical data analysis are available.

Through the implementation for about 10 years, the system has gained widespread acceptance. This acceptance would facilitate introduction of computer analysis to other leprosy projects and other disease control programs in China. Up to 1998, a database of more than 740,000 records covering all the leprosy patients detected since 1949 had been established by this system.

IZUMI, S., BUDIAWAN, T., SAEKI, K. et al. An epidemiological study on *Mycobacterium leprae* infection and prevalence of Leprosy in endemic villages by molecular biological technique. **Indian J. Lepr.**, v.71, n. 1, p.37, 1999.

One of the most important unsolved questions in epidemiology of leprosy is the highly uneven geographic distribution of the disease. There are many hyperendemic "pockets" in endemic countries. Little is known about the reasons why leprosy is hyperendemic in these areas. We conducted, therefore, a series of epidemiological studies on *Mycobacterium leprae* infection and prevalence of leprosy in North Maluku district, Maluku Province, Indonesia where leprosy is highly endemic. It was found that considerable number of general inhabitants are seropositive to various mycobacterial antigens and 27% of the villagers were carrying leprosy bacilli on their surface of nasal cavity. These results suggested the importance of *M. leprae* in the residential environment in infection of the leprosy bacillus and the resulting transmission of the disease. Based on these observations, we conclude that new preventive measures are essential for global elimination of leprosy in addition to early diagnosis and multidrug therapy (MDT).

LUE, H.C., CHEN, J.C., CHAO, J.Y.F. et al. Epidemiology of Leprosy in Taiwan; its pattern in children. **Int. J. Lepr.**, v.68, n. 1, p.57, 2000.

Objective: To study the epidemiology of leprosy in children in Taiwan.

Setting: Taiwan, with a population increase from 3.3 to 21.7 million, several tides of immigration and national leprosy control programs, from 1910 to 1997.

Design: To collect and analyze the documents of Taiwan leprosy surveys and charts of the National Leprosy Control Center.

Patients and measurements: Cumulative and new number of all-age and pediatric-age patients, prevalence rates, new case detection rates, and results of skin bacterial smears.

Results and conclusions: The prevalence rates of all-age leprosy ranged between 1.54 and 3.22 per 10,000 population. The proportion of children among all-age patients reached the highest of 4.93% in 1966, dropping to 0% in 1984 and thereafter, until 1988 and 1991 when two and one pediatric-age patients appeared, respectively; following the influx of immigrants from leprosy-endemic countries. The rise and fall of new patients younger than 15 years and 15 years or older were slightly correlated ($r=0.935$, $p<0.001$). Detection and confirmation of leprosy in children are usually belated.

Physicians should still be acquainted with the clinical diagnosis of leprosy since sporadic cases of leprosy can reappear, particularly among children coming from endemic countries.

MALL, R.P., TRIVEDI, D.S., KUMAR, S.A. et al. Study of low productive value of rapid survey as a means of Leprosy case detection in Kanpur Urban Project. **Indian J. Lepr.**, v.70, p.33s, 1998. Supplement.

A study was undertaken in Kanpur city to identify the reasons for low yield of rapid survey in leprosy case detection and to intervene to overcome the shortcomings. By a random cluster sampling method, 200 000 persons were selected for the study. Rapid survey was undertaken in half the area and in another half similar survey was undertaken after additional inputs. The additional inputs were staff training, IEC activities, changing of the survey timings and addition of a female worker to the survey teams. The proportion of the population enumerated population showed a significant rise (from 58.35% to 72.21%) in the test area with additional inputs. The number and the type of cases detected did not show any difference. Significantly, addition of female workers to the team did not improve the proportion of the female population examined or of female cases detected.

NAIK, S.S., THAKAR, U.H., PHRANDE, A.M. et al. Survey of leprosy in unapproachable and uncovered areas. **Indian J. Lepr.**, v.71, n.3, p.333, 1999.

Leprosy surveys in tribal population, fishermen and labourers engaged in construction work revealed prevalence rates of 32/10 000, 109/10 000 and 20/10 000 respectively, suggesting that systematic surveys have to be carried out in such population groups, to reach the goal of a " World without leprosy ".

IMUNOLOGIA - IMMUNOLOGY

BEERS, S., HATTA, M., KLATSER, P.R. Seroprevalence rates of antibodies to phenolic glycolipid-I Among School Children as an indicator of Leprosy Endemicity. **Int. J. Lepr.**, v.67, n.3, p.243. 1999.

In order to study whether the seroprevalence of antibodies to phenolic glycolipid-I (PGL-I) among school children is a useful indicator of the leprosy problem in certain areas, school surveys were carried out.

These surveys have the advantage of targeting an easily accessible, stable and standardized population. Antibodies to the species-specific PGL-I of *Mycobacterium leprae* were detected in a simple gelatin particle agglutination test.

We have determined the seroprevalence rates in 2835 school children from five different areas in three provinces of Sulawesi, Indonesia. Three areas with a case-detection rate of over 3.4/10,000 were designated as high-endemic areas. The other two were designated as low-endemic areas, having a case-detection rate of less than 1/10,000. The seroprevalence rates in the three high-endemic areas ranged from 26% to 28% (95% CI 21%-31%). In both low-endemic areas the seroprevalence rate was 7% (95% CI 5%-10%). In a second survey conducted in one high-endemic area 3 years after the first survey, the seroprevalence rate was the same as in the first survey. These results indicate that seropositivity rates among school children may reflect the leprosy incidence. They illustrate the potential applicability of seroprevalence as an indicator of the magnitude of the leprosy problem in a selected area.

BEURIA, M.K., MOHANTY, K.K., KATOCH, K. et al. Determination of circulating IgG subclasses against lipoarabinomannan in the Leprosy Spectrum and reactions. **Int. J. Lepr.**, v.67, n.4, p.422, 1999.

IgG subclasses against lipoarabinomannan of mycobacteria were analyzed in the sera of leprosy patients. Patients with active leprosy [tuberculoid and

lepromatous, patients undergoing erythema nodosum leprosum (ENL) and reversal reactions] and inactive cases (tuberculoid and lepromatous who were cured after chemotherapy) were included in this study. Active lepromatous patients had higher levels of IgG subclasses, except IgG4, compared to active tuberculoid patients. Some of the inactive cases (lepromatous patients cured after chemotherapy) were positive for the IgG1, IgG2 and IgG3 subclasses. However, their levels are lower than active lepromatous cases. On the other hand, no difference in the subclass levels between the active and inactive tuberculoid groups could be observed. While a significant fall in the level of IgG3 in ENL was observed as compared to lepromatous leprosy without ENL, higher levels of IgG1 and IgG2 were found in patients with reversal reactions compared to their active counterparts without reactions.

FAFUTIS-MORRIS, M., GUILLEN-VARGAS, C.M., NAVARRO-FIERRO, S. et al. Serum IL-1 ra is elevated in lepromatous Leprosy patients. **Int. J. Lepr.**, v.67, n.3, p.287, 1999.

Patterns of production of specific cytokines are accepted as standards for T-lymphocyte subsets in diseases caused by intracellular parasites. These lymphocyte subsets (Th1 and Th2) have been associated with the different poles of the leprosy spectrum. Lepromatous leprosy (LL) onset correlates with cytokines produced by Th2 cells on the grounds of the patient's poor cellular immune response, i.e., interleukin 2 (IL-2) and gamma interferon (IFN- γ) deficiency. On the other hand, tuberculoid leprosy (TL) has been associated with a Th1 response. Moreover, pro-inflammatory cytokines like IL-1B and tumor necrosis factor-alpha (TNF- α) play a major role in chronic inflammatory pathologies being IL1ra and TNF- α soluble receptors, natural counterbalancing inhibitors.

In light of this background, we decided to measure serum levels of IL-1B, IL-1 ra, TNF- α and IL-6 in LL and TL patients, and we also studied the production *in vitro* of Th1 (IFN- γ , IL-2), Th2 (IL-4, IL-10) and TNF- α cytokines. Our data showed that IL-1 ra is highly elevated in sera from LL patients; there were no differences in Th2 cytokine levels and there were diminished levels in Th1 cytokines.

GONZALEZ, Ana Cristina de O., SILVA, Tânia C., BARBOSA JUNIOR, Aryon de A., SADIGURSKY, Moisés. Immunohistologic appraisal of infiltrating cells in skin biopsies from young patients clinically suspected of having various forms of leprosy. **An. bras. Dermatol.**, v. 74, n.4, p. 365-71, jul.-ago, 1999.

FUNDAMENTOS - Na hanseníase, existem poucas informações imunológicas sobre os tipos celulares nas lesões iniciais de pacientes jovens.

MATERIAL E MÉTODOS - Biópsias da pele obtidas de 28 pacientes jovens não clinicamente suspeitos de hanseníase foram utilizadas para estudar os fenótipos de superfície produzidos pelas células inflamatórias, demonstrados pela imunohistoquímica usando-se os anticorpos monoclonais LCA; HAM-56; Pan-B; PanT; CD4; CDB; Leu7, e os policlonais anti proteína S-100 e anti BCG. Uma análise semiquantitativa das células coradas foi feita.

RESULTADOS - Em 24 casos, o diagnóstico histopatológico de Hanseníase pôde ser feito: nove de forma indeterminada (IND); cinco da forma tuberculóide (TT); seis da forma dimorfa tuberculóide (BT) e quatro da forma virchowiana (LL). Todos os casos foram positivos para LCA. No grupo LL as células mais conspícuas foram os macrófagos, seguidos pelos linfócitos T. A subpopulação TCD8 foi mais freqüente que TCD4. No grupo BT as células T eram predominantes, com as CD4 discretamente mais freqüentes que CD8, seguidas dos macrófagos. No grupo TT as células T também predominavam e dentre estas as CD4 eram as mais conspícuas. Os macrófagos eram as segundas células mais freqüentes. O grupo IND foi heterogêneo. As células T foram as mais freqüentes com células CD4 e CD8 mostrando mesma freqüência que os macrófagos.

DISCUSSÃO - Este estudo confirmou que as células T são as mais freqüentes nos grupos TT/BT, existindo maior número destas células nestes casos que no grupo LL, indicando reatividade imunológica consoante com a presença e atividade de células T. Além disso, anticorpos contra subpopulações de células T mostraram nos casos TT/BT mais células CD4 positivas e nos casos LL mais células CD8 positivas proliferaram. As formas IND mostraram gradação na composição dos infiltrados. Nossos resultados demonstram que lesões cutâneas em pacientes jovens com a forma indeterminada inicial da Hanseníase e com várias formas definidas diferem em relação às células inflamatórias (AU).

GORMUS, B.J., BASKIN, G.B., XU, K. et al. Antileprosy protective vaccination of rhesus monkeys with BCG or BCG Plus heat-killed *Mycobacterium leprae*: immunologic observations. *Int. J. Lepr.*, v.68, n. 1, p.27, 2000.

Groups of rhesus monkeys were vaccinated and boosted with *Mycobacterium bovis* bacillus Calmette Guerin (BCG) or BCG plus low-dose (LD) or high-dose (HD) heat-killed *M. leprae* (HKML), or were unvaccinated.

Prior to and following vaccination-boosting and subsequent *M. leprae* (ML) challenge, these and unvaccinated, unchallenged control monkeys were observed longitudinally for approximately 3 years.

Vaccination with BCG plus HKML initially stimulated significant *in vitro* blood mononuclear cell blastogenic responses to lepromin, which returned to baseline postboosting and post-live-ML-challenge, minimally reappearing significantly 2 years post-ML-challenge. Vaccination with BCG failed to stimulate positive blastogenic responses to lepromin before ML-challenge but small, marginally positive, intermittent responses were seen post-ML-challenge.

Compared to the unvaccinated ML-challenged group, significant increases in the numbers of blood CD4+ and CD8+ T-cell subsets and an increased CD4+:CD8+ ratio were observed in both BCG plus HKML-vaccinated, ML-challenged groups, but not in the BCG-only-vaccinated, ML-challenged group. CD4+CD29+ and CD4+CD45RA+ subset numbers increased significantly over time in only the BCG plus LD HKML-vaccinated, ML-challenged group.

Compared to unvaccinated, ML-challenged groups, vaccination with BCG or BCG plus HKML followed by ML-challenge produced lower IgM:IgG antiphennolic glycolipid I (PGL-I) serum antibody ratios and protected rhesus monkeys from clinical leprosy, consistent with prior observations that low IgM:IgG anti-PGL-I responses correlated with resistance to and protection from leprosy.

JOB, C.K., TRUMAN, R.W. Comparative study of Mitsuda reaction to nude mouse and armadillo lepromin preparations using nine-banded armadillos. *Int. J. Lepr.*, v.68, n. 1, p.18, 2000

In 14 nine-banded armadillos the Mitsuda response to nude mouse-derived lepromin (lepromin-*nu/nu*) was compared to that of armadillo-derived lepromin (lepromin-A) by injecting the reagents intradermally into either side of the abdomen of the animal and examining the biopsies from the sites after 12 days. The histopathologic responses to both antigens were found to be similar, whether the animal was Mitsuda negative (lepromatous) or Mitsuda-positive (tuberculoid). It is pointed out that armadillos are good experimental models for leprosy, and their use can replace humans in experimental studies.

IOKO, S., NUMAGA, J., KAWASHIMA, H. et al. Human leukocyte antigens in forms of Leprosy among Japanese patients. *Int. J. Lepr.*, v.68, n. 1, p.49, 2000.

Human leukocyte antigens (HLA) class II alleles were

analyzed among Japanese leprosy patients to ascertain whether immunogenetic differences exist among the leprosy classification forms of Ridley and Jopling. Ninety-three unrelated Japanese leprosy patients (21 lepromatous, 24 borderline lepromatous, 17 mid-borderline, 26 borderline tuberculoid, 5 tuberculoid) and 114 healthy control subjects were investigated. The frequencies of HLA-DRB1*1501, -DRB5*0101, DQA1 *0102 and DQB1 *0602 were significantly increased in all of the Japanese leprosy patients. The frequencies of HLA-DRB1*0405, -DQA1*03 and DQB1 *0401 were significantly decreased in the Japanese patients after correction of the p value. Conversely, there were no significantly different distributions of the HLADRB1, -DRB5, -DQA1, DQB1 alleles in the five subgroups of these patients.

We conclude that HLA class II alleles were not associated with the form of leprosy.

Other HLA, a non-HLA gene, and/or environmental factors may play a critical role in the different manifestations of leprosy.

MUSTAFA, A.S. M. leprae recombinant antigens important for T-cell reactivity. **Indian J. Lepr.**, v.71, n. 1, p.75, 1999.

Identification of *M. leprae* antigens recognized by Tcell is important for specific diagnosis, vaccine development and understanding the basic mechanisms involved in protection against and pathogenesis of leprosy. Screening of an *M. leprae* recombinant DNA library with antibody probes led to the identification of half a dozen *M. leprae* antigens recognized by Bcells. When tested for T-cell reactivity, all the antigens recognized by antibodies were shown to have T-cell reactivity. However, among these antigens 18 kDa, 65 kDa and 70 kDa heat shock proteins (hsps) were most frequently recognized by T-cell lines and clones established from healthy donors vaccinated with killed *M. leprae*. A 24 kDa secreted antigen of *M. leprae* with T-cell epitope specific for *M. leprae* and *M. tuberculosis* complex was identified by direct screening of the recombinant DNA library with Tcell clones. The recombinant T-cell antigens of *M. leprae* were recognized by memory T-cells of Th1 type in association with multiple HLA-DR molecules. Epitope mapping with synthetic peptides identified *M. leprae* specific as well as cross-reactive T-cell epitopes on the 18 kDa, 65 kDa and 70 kDa hsp antigens. In conclusion, our studies suggest that the recombinant antigens of *M. leprae* could be useful as reagents for specific diagnosis as well as in subunit and recombinant vaccine design against leprosy.

ROCHE, P..W., FAILBUS, S.S., BRITTON, W.J. et al. Rapid method for diagnosis of Leprosy by measurements of antibodies to the *M. leprae* 35-kDa protein: comparison with PGL-1 antibodies detected by ELISA and "Dipstick" methods, **Int. J. Lepr.**, v.67, n.3, p.279, 1999.

A new rapid immuno-chromatographic test card for the detection of antibodies to the *Mycobacterium leprae* 35-kD protein is described. The new assay is compared in the same group of subjects with a direct enzyme ELISA method for 35-kD antibodies and with assays for antiphenolic glycolipid-1 (PGL-1) antibodies using a standard ELISA as well as the recently described "dipstick" method. Good concordance was found between the rapid methods and the corresponding ELISA methods. The detection of untreated paucibacillary leprosy by the 35kD test card was 59% compared with 27% for the PGL-1 dipstick; however, the specificity for the 35-kD test card was 90% compared with 100% for the PGL-1 dipstick in an endemic population. The potential application of these new, rapid serologic methods for the diagnosis of leprosy under field conditions is discussed.

ROJAS-ESPINOSA, O., RODRIGUEZ, K.R., HERNANDEZ, J.A.V. et al. Do antibodies to phospholipid antigens play any role in murine Leprosy? **Int. J. Lepr.**, v.67, n.4, p.453, 1999.

In order to know whether antibodies to phospholipids and other host lipids play a role in the pathology of murine leprosy we looked for the presence of antibodies to cardiolipin, cerebroside sulfatide, and to lipids extracted from normal murine spleen, liver and brain in the sera of mice bearing a 6-month infection with *Mycobacterium lepraemurium*. We also looked for the presence of antibodies to lipids isolated from *M. lepraemurium*. We found that all of the 16 animals examined contained high levels of antibodies to the mycobacterial lipids of intermediate polarity (mostly glycolipids) but none of them had antibodies to the other lipids tested, including those isolated from mouse liver, spleen and brain, bovine cardiolipin and sulfatide, nor any significant levels of antibodies to mycobacterial lipids of high or low polarity. The infected animals also had high levels of antibodies to antigens sonically extracted from the microorganism. Antibodies to the socially extracted antigens (mostly proteins) were mainly IgG, while antibodies to the lipid antigens were predominantly Igm. Despite the low but significant percentage (1%-3%) of infected animals developing bilateral paralysis of the rear limbs, autoimmunity (due to antibodies to phospholipids and other host lipids) does not seem to be a feature of murine leprosy.

SOTO, C.Y., MORENO, PA., VALENCIA, J.T. et al. Isolation, characterization, molecular cloning and amplification of a Species-Specific *M. leprae* antigen. **Int. J. Lepr.**, v.67, n.4, p.392, 1999.

A polyclonal serum sample from a lepromatous leprosy (LL) patient, which presented a specific recognition pattern for leprosin, was used to screen a *Mycobacterium leprae* genomic library constructed with DNA isolated from human lepromas. One clone, designated ML4-1, which expressed a specific antigenic determinant of *M. leprae* as part of a B-galactosidase fusion protein, was isolated. The 1.932 bp *M. leprae* derived genomic fragment was sequenced, and it had an incomplete open-reading frame shown to code for a 644 amino-acid polypeptide (72.3 kDa). Some partial nucleotide homology to the *M. tuberculosis* MTCY9C4 cosmid and the *M. leprae* B1913 cosmid were found. Southern blot assays using the 584 bp *Eco* RI-Bam HI fragment excised from the ML4-1 clone revealed that this sequence is present only in the *M. leprae* genome and not in the 24 different mycobacterial DNA tested. Two oligonucleotides based on the genomic sequence were also synthesized and used as amplifiers for a polymerase chain reaction (PCR) test, giving a positive signal exclusively in *M. leprae* DNA. Furthermore, 32 sequential synthetic peptides, 20 aminoacids long, spanning the entire protein corresponding to the hypothetical ML4-1 clone sequence, were synthesized and evaluated by ELISA. A peptide included in the 221-240 region was significantly recognized by either lepromatous leprosy or healthy tuberculosis contact patient sera.

Thus, PCR amplification of this fragment, along with the recognition of its protein sequence by leprosy patient sera, could be a useful tool for a potential diagnostic method in the detection of *M. leprae* infection in the future.

STANFORD, J.L., THAPA, N., RAFI, A.N. et al. Anticuerpos frente a proteínas de estrés en Lepra de larga evolución, con su probable asociación a deterioro tisular autoinmune y el resultado de aplicar inmunoterapia con *Mycobacterium vaccae* inactivado. **Fontilles - Rev. Lepr.**, v.22, n.3, p.265, 1999.

In this small study of chronic leprosy patients randomised to receive an injection of killed *Mycobacterium vaccae* in the past, IgG and IgA antibody titres have been measured to the 65kDa and 70kDa heat shock proteins of BCG. It was found that, in common with other inflammatory diseases with dysregulated cellular immunity, patients had higher levels of IgG to these antigens than did healthy staff members. Immunotherapy was associated with antibody titres reduced towards

normal levels. For IgG to hsp 65kDa this was statistically significant in the Iranian patients, receiving the immunotherapy a year or more before sera were taken. In the Spanish patients receiving immunotherapy 10 years before the sera were taken, although not reaching statistical significance, there were strong trends towards the same finding for hsp 65kDa, also seen in IgA titres. The relationship of these findings to autoimmune disease and to a switch from Th2 to Th1 helper T-cell activity is discussed.

TOMIMORI-YAMASHITA, J., CRUAUD, P., ROTTA, O. et al. Antibody-based enzyme-linked immunosorbent assay for determination of anti-PGL-1 specific circulating immune complex in leprosy patients. **Lepr. Rev.**, v.70, n.3, p.261, 1999.

A serological study was performed in 122 individuals: 75 leprosy patients and 47 healthy controls. The ELISA test was performed for IgG and IgM using the glycolipid PGL-1 antigen from *Mycobacterium leprae*. Circulating immune complexes (CIC) were isolated by PEG 6000 precipitation method and after dissociation with an acid solution, the IgG and IgM specific against PGL-1 were tested with the ELISA test. The multibacillary patients had high levels of antibodies, compared with paucibacillary patients and controls. The antibodies isolated from the CIC presented a similar spectrum spectral distribution as the serology. A positive correlation between the levels of free and CIC bound antibodies was observed. In contrast with tuberculosis patients, specific antibodies present in CIC were not responsible for false-negative results found in some multibacillary patients serology, since no or very low levels of specific antibodies were found in PEG precipitated serum of these patients. No relation was observed with specific antibody levels detected in CIC during leprosy reactions.

VAN DEN BOS, I.C., KHANOLKAR-YOUNG, S., DAS, P.K. et al. Immunohistochemical detection of PGL-1, LAM, 30 kD and 65 kD antigens in Leprosy infected paraffin preserved skin and nerve sections. **Lepr. Rev.**, v.70, n. 3, p.272, 1999.

A panel of lipid, carbohydrate and protein antibodies were optimized for use in detecting *M. leprae* antigens in paraffin embedded material. Skin and nerve biopsies from 13 patients across the leprosy spectrum were studied. All antibodies detected antigen in tissues with a B1>1. Phenolic-glycolipid was not detected in bacteriologically negative tissue but lipoarabinomannan (LAM) and protein antigens were detected. Staining with LAM was strongest and gave least background. The

transfer of this immunohistochemical technique to paraffin embedded material will allow examination of tissue with better morphology and from clinics without access to tissue freezing facilities.

MICROBIOLOGIA MICROBIOLOGY

ADAMS, L.B., SOILEAU, N.A., BATTISTA, J.R. et al. Inhibition of metabolism and growth of *Mycobacterium leprae* by Gamma Irradiation. **Int. J. Lepr.**, v.68, n. 1, p. 1, 2000.

Mycobacterium leprae is uncultivable on artificial medium, but viability can be maintained without multiplication for a limited time in vitro. In this study, we evaluated gamma-irradiation (γ -irr) as a means to kill this slowly growing organism. Freshly harvested, viable, athymic, nu/nu mouse-derived *M. leprae* were exposed to varying doses of γ -irr from a ^{60}Co source. Two indicators of bacterial viability were determined: metabolism, measured by oxidation of ^{14}C -palmitic acid to $^{14}\text{CO}_2$ in the BACTEC 460 system, and multiplication, measured by titration in the mouse foot pad γ -irr of both *M. leprae* and *M. lufu*, a cultivable control mycobacterium, resulted in a dose-dependent inhibition of viability γ -irr of up to 10^7 rad had little effect on the metabolic activity of either organism for *M. leprae*, 10^7 - 10^8 rad caused an intermediate inhibitory effect; whereas as 10^9 rad yielded almost total inhibition. In the mouse foot pad assay, up to 10^7 rad had little effect on *M. leprae* growth; however, 10^8 rad resulted in at least a >2 -log reduction in the number of bacilli recovered and no *M. leprae* growth was measurable after exposure to 10^9 rad. With *M. lufu*, 10^8 rad inhibited metabolic activity by 99% and caused > 2 -log reduction in the number of colony forming units (CFU). No CFU of *M. lufu* were recovered after exposure to 10^9 rad. Scanning electron microscopy revealed the presence of some aberrant protrusions on the cell surface of lethally irradiated *M. leprae*; whereas boiling and autoclaving caused obvious morphological denaturation.

These data suggest that γ -irr is an effective way to kill *M. leprae* without causing extensive damage to the cell architecture. Killing *M. leprae* by γ -irr may be preferable when comparing cellular responses to live versus dead bacilli *in vitro* and *in vivo*.

FIALLO, P., CARDO, PP., NUNZI, E. Identification of sequence similarities between *Mycobacterium leprae* and the myelin proteolipid protein by computational analysis. **Indian J. Lepr.**, v.71, n. 1, p.1, 1999.

This study was undertaken under the assumption that antigenic mimicry plays a role in the pathogenesis of neuropathy in leprosy, a unique feature among mycobacterial diseases. The SWISS-PROT protein sequence databank was scanned using a computer programme based on an identify matrix algorithm, to identify common amino acid regions between human myelin and mycobacterial proteins. The highlighted motifs were back-tested against a database of MHC-binding peptides (MHCPEP). Of the 28 common sequences between mycobacterial and human myelin proteins, only two were found to yield some matches with MHC presenting peptides. Both motifs were from *M. leprae*. The myelin proteolipid protein was the human protein containing the identified similarities. We believe that this theoretical approach can provide a way to predict potentially "mimetic" motifs by search for antigenic regions in protein sequence databases without screening a large number of synthetic peptides.

HARBOE, M., WIKER, H.G. Searching for secreted proteins of *Mycobacterium leprae*. **Indian J. Lepr.**, v.71, n. 1, p.19, 1999.

In mycobacteria secreted proteins represent a distinct group, probably of particular importance for development of immune responses following infection. Quantification of individual proteins in *Mycobacterium tuberculosis* culture fluid and corresponding disrupted bacilli permits determination of a localization index for identification of secreted proteins. This procedure cannot be applied for *Mycobacterium leprae* since secreted proteins are lost during isolation of bacilli from tissues. The DNA sequences of secreted proteins of *M. tuberculosis* were compared with sequences of *M. leprae*.

Genes for homologues of the 85a, 85b, 85c, mpt32 (apa), mpt51, erp, mtc28, mtb12, Rv3354 and Rv0526 genes were identified. All of these and six genes of the mcel operon contain signal sequences for secretion in *M. leprae* as well. In several instances the local distance between marker genes and occurrence on the same or the complementary DNA strand was similar in these two species. The genomic organization of genes for secreted proteins is thus very similar in *M. leprae* and *M. tuberculosis*, the homology being higher for the mature polypeptide chains than for the corresponding signal peptides.

MATSUOKA, M., IZUMI, S., BUDIAWAN, T. et al. *Mycobacterium leprae* DNA in daily using water as a possible source of Leprosy infection. **Indian J. Lepr.**, v.71, n. 1, p.61, 1999.

Some environmental factors were suspected to be sources of leprosy infection according to the results of total survey in the highly endemic villages in Indonesia. *M. leprae* DNA were detected by PCR from 21 out of 44 water sources used daily by villagers. Prevalence of leprosy among the people using PCR-positive water for bathing and washing was significantly higher than that among the people who used PCR-negative water. No significant difference in prevalence was, however, recognized in case of usage of negative or positive water for drinking. Water was regarded as a reservoir and infectious source of *M. leprae*. Transmission of leprosy through the contaminated water was strongly suggested by epidemiological analysis.

RADA, E., ARANZAZU, N., ULRICH M, et al. Serologic response to mycobacterial proteins in Hansen's patients during Multidrug treatment. **Int. J. Lepr.**, v. 67, n. 4, p.414, 1999.

Humoral immune responses were studied in 24 leprosy patients treated with multidrug therapy (MDT) and 16 contacts. The patients were monitored for 2 to 3 years with repeated determination of IgG antibody levels directed to different mycobacterial proteins (*Mycobacterium tuberculosis*, Mt70; *M. bovis*, Mb65; *M. leprae*, MI36, 28, 18, 10 kDa, and the complete protein *M. leprae* extract, MLSA). All recombinant antigens were used at 5 mg/ml concentration and the complete soluble *M. leprae* extract at 2 µg/ml. The results shown in this study reveal a clear decline in IgG antibodies directed toward mycobacterial proteins in the 12 multibacillary (MB) patients when they were submitted to MDT.

Initially we found strong reactivity toward complete cytosolic protein and *M. leprae* membrane protein. The most reactive recombinant proteins in MB patients were M110, M136, Mt70 kDa and, finally, M118 kDa when compared to the paucibacillary (PB) group. After treatment was completed all lepromatous and borderline lepromatous patients showed low or undetectable levels as compared with their initial values before starting treatment.

YOGI, Y. BANBA, T., KOBAYASHI, M., KATOH, H, et al. Leprosy in hypertensive nude rats (SHR/Ncrj-rnu). **Int. J. Lepr.**, v.67, n.4, p.435, 1999.

Since more than a decade ago, we have attempted to develop spontaneously hypertensive rats carrying the

nude gene that permits high multiplication of *Mycobacterium leprae*. A congenic strain carrying nude (*mu*) and hypertensive genes was produced using SHR/Ncrj females and F344/NJcl-rnu males. Cross-intercross was carried out 12 times to establish the hypertensive nude rat congenic strain. As a result of the genetic monitoring test with NE12F2 generation rats, the genetic profile of the SHR/Ncrj-rnu rats was the same as that of the SHR/Ncrj rats except for the *mu* gene.

We have successfully developed a hypertensive congenic nude rat strain (SHR.F344Hfhl 1; SHR/Ncrj-rnu). An increase in the blood pressure in nude rats was found to begin at a slightly delayed age when compared with their hairy litter mates. Both female and male rats showed the highest blood pressure at approximately 20 weeks of age-166 ± 1.4 and 197 ± 11 mm Hg in nude rats and 175 ± 11 and 193 ± 3.2 mm Hg in their hairy litter mates in female and male rats, respectively. In the present study, comparisons were made on the susceptibility to *M. leprae* in hypertensive SHR/Ncrj-rnu and normotensive F344/NJcl-rnu rats. We have reconfirmed that hypertensive SHR/Ncrj-rnu rats of the NE12F3 generation were highly susceptible to *M. leprae*.

In the SHR/Ncrj-rnu rats of both sexes excellent massive swelling due to multiplication of *M. leprae* was observed and also, nodular lesions were produced in uninoculated fore feet and lips while those sites in the F344/NJcl-mu rats showed only a slight swelling of the inoculated feet with mild nodular lesions. Although mild lymphocyte proliferation was seen only in the *M. leprae*-inoculated site with numerous bacilli and partial necrosis in the SHR/Ncrj-rnu rats, at noninoculated sites, multiplication of *M. leprae* was only observed in the cells of the mononuclear phagocyte system. However, in F344/NJcl-rnu rats, lymphocyte proliferation with a few neutrophils was seen at the site of inoculated hind foot pads and everywhere at the site of multiplication of *M. leprae*. There was a wide difference in the susceptibility to *M. leprae* between the SHR/Ncrj-rnu and the F344/NJcl-mu rats.

NEUROLOGIA - NEUROLOGY

ANDERSON, A.M., CROFT, R.R Reliability of Semmes Weinstein monofilament and ballpoint sensory testing, and voluntary muscle testing in Bangladesh. **Lepr. Rev.**, v.70, n.3, p.305, 1999.

The reliability of methods of testing nerve function is important, since diagnostic decision making is a direct function of the quality of the test. Three methods of nerve function testing were investigated at the Danish Bangladesh Leprosy Mission (DBLM) in north Bangladesh, and assessed

for inter-observer reliability. The three methods were 1) ballpoint pen test (BPT) for sensory function; 2) graded Semmes Weinstein monofilament test (SWM) for sensory function and 3) voluntary muscle testing (VMT) for motor function. The weighted kappa (k_w) statistic was used to express inter-observer reliability. Using this statistic, 0 represents agreement no better than random, and 1.0 complete agreement, k_w values of >0.80 are reckoned to be adequate for monitoring and research. Fifty-three patients were tested, a Senior physiotherapist acting as 'gold standard' against whom four other staff physiotherapists were assessed. All three testing methods were found to have minimal interobserver variation, with the k_w for inter-observer agreement using BPT being 0.86, the SWM 0.92, and VMT 0.94. It is concluded that in trained and experienced hands, all three methods are reliable and repeatable to a level allowing confident use of results obtained in monitoring and research.

CROFT, R.P, NICHOLLS, P.C., RICHARDUS, J.H, et al. Incidence rates of acute nerve function impairment in Leprosy: a prospective cohort analysis after 24 months (The Bangladesh Acute Nerve Damage Study). **Lepr. Rev.**, v.71, n. 1, p.18, 2000.

In this paper, the incidence rates and cumulative incidence of nerve function impairment (NFI) and leprosy reactions over 24 months follow-up of the prospective cohort of 2664 new leprosy cases are presented. Graphs showing the cumulative incidence of NFI relative to time since registration are presented. Hazard ratios (HRs) for the development of NFI for four variables are given. The majority of patients who developed NFI after registration did so in the first year (67% of multibacillary (MB) patients, and 91% of paucibacillary (PB) patients who developed NFI). Thirty-three percent of all MB patients who developed NFI after registration did so in the second year of follow-up. No PB patients developed NFI for the first time in the last 6 months of follow-up. However, seven NFI events occurred amongst PB patients in that period, amongst those who had already had one NFI event. The incidence rate (IR) of NFI amongst MB patients was 24/100 person-years at risk (PYAR), and amongst PB patients was 1.3/100 PYAR. The HR for the development of NFI amongst MB patients compared with PB patients was 16 using univariate analysis. Amongst patients who had long-standing NFI present at registration, the IR was 27/100 PYAR compared with 1.7/100 PYAR amongst those who did not have long-standing NFI. The HR for developing acute NFI amongst those with long-standing NFI present at registration compared with those without was 14 using univariate analysis. When multivariate regression analysis is applied, the apparently significant

univariate HRs for sex and age disappeared. The resultant multivariate HR for leprosy group is 8.8, and 6.1 for the presence/absence of long-standing NFI at registration. In all, 142/166 (86%) of all new NFI events were silent, underlining the need for regular nerve function testing, IRs are presented for the four 6-month periods of the 24 month follow-up. They show a clear stepwise reduction over the total period. The IRs amongst MB patients and those with long-standing NFI present at registration are very high at 34 and 41/100 PYAR, respectively, for the first 6 months of follow-up. Even during the final 6-month period, the IR is maintained at a moderately high level (18 and 15/100 PYAR, respectively).

JAYASEELAN, E., SHARIFF, S., ROUT, P. Cytodiagnosis of primary neuritic leprosy. **Int. J. Lepr.**, v.67, n.4, p.429, 1999.

The diagnosis of primary neuritic leprosy (PNL) and its differentiation from other causes of peripheral neuropathy is difficult since acid-fast bacilli (AFB) smears and skin biopsy are negative from anesthetic areas. A biopsy of the involved nerve is the only conclusive method of diagnosis.

Such a biopsy may not necessarily be free of complications when a large nerve is involved. However, fine needle aspiration has in this study proved to be a simple technique to demonstrate inflammation granulomas and AFB from these involved nerves in 18 of the 27 cases suspected to have PNL. The validity of the cytological classification into morphological subtypes may have to be supplemented by a large series of studies.

LEMIEUX, L., CHERIAN, T.A., RICHARD, B. The stapedial reflex as a topographical marker of proximal involvement of the facial nerve in Leprosy. A pilot study. **Lepr. Rev.**, v.70, n.3, p.324, 1999.

This study aimed to determine the parameters necessary for a study of stapedial reflexes in leprosy patients to ascertain if the facial nerve is involved more proximally than the stylomastoid foramen. It involved leprosy patients with and without facial nerve involvement and non-leprosy controls. Clinical examination of the patients' ears, a tympanogram and audiogram to exclude conductive and sensorineural deafness, followed by the measurement of a stapedial reflex and the acoustic reflex threshold, were carried out. The number of absent reflexes and the acoustic reflex thresholds did not differ between the three groups of subjects. A definitive study would be logistically impossible. Suggestions are made as to more exact patient selection in order to demonstrate any stapedial reflex changes due to leprosy. The findings

of this study do not suggest that facial nerve pathology extends proximally to the stylomastoid foramen, unless such proximal involvement is subclinical to the methods used.

RICHARD, B.M., JACOBS, J.M. Facial nerve pathology in Leprosy: searching for the proximal extent of the lesion facial nerve biopsies. *Lepr. Rev.*, v.70, n.3, p.333, 1999.

A light and electron microscopy study was made of resin embedded facial nerves in three cases of leprosy involving the facial nerve palsies and had requested facial reconstruction. No consistent pattern of nerve fibre damage as found. In one case the temporozygomatic was affected but the cervical branch was normal, suggesting the damage begins distally.

In two cases the loss of nerve fibres in the trunk and all branches was similar, and is likely to emanate from damage at a more proximal site. The presence of increased numbers of unmyelinated axons, often in clusters, is evidence of regeneration. These axons probably have the potential to develop into functional myelinated fibres provided that they can innervate a viable distal target such as a muscle graft. These regenerating axons are distal to the stylomastoid foramen suggesting that the most proximal level of involvement of the facial nerve could be intracranial. The finding of a more proximal level of nerve involvement, implies that the misreinnervation seen in partially recovered facial nerve palsies in leprosy, could be due to some regenerating axons being mis-directed at the level of the main trunk bifurcation.

SHETTY V.P., MATHARU, P.S., ANTIA, N.H. Sciatic nerve of normal and T200x5R swiss white mice fails to support multiplication of intraneurally injected *M. Leprae*. *Int. J. Lepr.*, v.67, n.4, p.446, 1999.

In a preliminary study we have shown that freshly harvested *Mycobacterium leprae*, when injected into the sciatic nerve in normal and immunosuppressed (TR) mice, induce massive but localized epithelioid and macrophage granuloma, respectively, in 3-4 weeks. In order to determine the fate of *M. leprae* injected intraneurally into normal and TR mice, in the present study we measured sequentially the viability, fold increase and clearance, if any, using semiquantitative methods. The average *M. leprae* yield per nerve assessed at regular intervals, beginning at 24 hr and including 72 hr, 1 week, 2, 3, 4, 12, 24 and 48 weeks, showed neither a significant increase nor a decrease in either the normal or the TR mice. The viability of *M. leprae*, assessed using the

standard mouse foot pad method, showed a significant decrease as compared to baseline growth effective at 24 hr and remained static until approximately 4 weeks.

A further decline and total loss of viability was noted by 12 months. The results show that injection of *M. leprae* via the intraneural route in both normal and TR mice failed to sustain the viability and failed to support the multiplication of the organisms.

WERNECK, Lineu Cesar, TEIVE, Hélio A. G, SCOLA, Rosana Herminia. Muscle involvement in leprosy: study of the anterior tibial muscle in 40 patients. *Arq. Neuropsiquiatr*, v.57, n.3B, p.723-34, set., 1999.

The involvement of skeletal striated muscle in leprosy is considered secondary due to peripheral neuropathy, but some studies point it to a primary muscle lesion. In order to investigate the muscle involvement in leprosy, we studied 40 patients (lepomatous 23, tuberculoid 13, borderline 2 and indeterminate 2). The motor nerve conduction of the peroneal nerves had a reduction of the velocity, decreased compound muscle action potential and sometimes absence of potentials. The electromyography study of the anterior tibial muscle showed signs of recent and chronic denervation in 77.5 per cent of the cases and no myopathic potentials. The anterior tibial muscle biopsy revealed denervation in 45 per cent of the cases, interstitial inflammatory myopathic in 30 per cent and mixed (myopathic and neuropathic) pattern in 12.5 per cent. Acid fast bacillus was detected in 25 per cent of the cases, always in the interstitial tissue. Inflammatory reaction was present in the interstitial space and in patients with the lepomatous type. The histological findings clearly defined the presence of the so-called "Leprous Interstitial Myositis" on the top of denervation signs.

OFTAMOLOGIA - OPHTALMOLOGY

DANIEL, E., PREMKUMAR, R., KOSHY, S. et al. Hypopigmented face patches; their distribution and relevance to ocular complications in leprosy. *Int. J. Lep.*, v. 67, n.4, p. 388, 1999.

Eighty-two leprosy patients with hypopigmented patches over the face (cases) and an equal number of age, sex-, and classification-matched leprosy patients without any hypopigmented patches over the face (controls) were examined for the distribution of hypopigmented facial patches, areas of anesthesia over the face, and eye complications. The hypopigmented patches did not follow any pattern and overlapped in the areas of sensation

supplied by the three branches of the trigeminal nerve. Anesthesia over the face, evaluated by a Semmes-Weinstein monofilament which exerted a force of 0.05 grams, was present in 19.5% of the cases and 15.9% of the controls. Patients with hypopigmented facial patches were found to have more corneal hypoesthesia than patients who did not have hypopigmented facial patches. The risk of having impaired corneal sensation was three to four times higher in patients with hypopigmented facial patches. This feature can be used to identify decreased corneal sensation among leprosy patients under field conditions where direct estimation of corneal sensation is **not** advocated

PATOLOGIA - PATHOLOGY

EBENEZER, G.1., JOB, A., ABRAHAM, S. et al. Nasal mucosa and skin of smearpositive Leprosy patients after 24 months of fixed duration MDT: histopathological and microbiological study, **Int. J. Lepr.**, v.67, n.3, p.292, 1999.

The skin and nasal mucosa of 10 lepromatous leprosy patients who had completed 24 doses of fixed duration multidrug therapy (MDT) but who continued to be skinsmear positive for acid-fast bacilli (AFB) were examined histopathologically. The nasal mucosa showed granuloma fractions that exceeded those seen in the skin specimens, signifying that activity in this region subsides much more gradually than the activity in the skin. Mouse foot pad studies done using T900r mice with an inoculum from the nasal mucosa biopsy specimens of these patients did not demonstrate any growth of *Mycobacterium leprae*, indicating that these bacilli were not viable. A skin specimen from one patient grew significant amounts of bacteria in the T900r mouse foot pad. These results show that 2 years of treatment with MDT would prevent dissemination of *M. leprae* from the nasal mucosa and, therefore, should preclude further transmission of the disease. It also indicates that viable bacteria might persist in the skin of patients, especially those with an initial bacterial index of ?4+ who have completed 24 doses of regular MDT. Therefore, a more cautious approach to administering only 12 doses of MDT to highly positive multibacillary patients is suggested.

EBENEZER, G.J., JOB, C.K. Histopathological activity in paucibacillary Leprosy patients after ROM therapy. **Int. J. Lepr.**, v.67, n.4, p.409, 1999.

Histopathological activity was assessed in the skin tissue of 13 skin-smear negative, borderline tuberculoid

leprosy patients after administration of a single dose of ROM (rifampin 600 mg, ofloxacin 400 mg and minocycline 100 mg) therapy. Biopsies taken just before therapy showed *Mycobacterium leprae* to be present in eight cases.

After 6 months, only three showed granulomatous lesions and others showed only resolving or inactive lesions. Acid-fast bacilli (AFB) persisted in the nerves of three cases. At the end of 12 months, granulomas persisted in 2 out of 13 (15 %) patients. No bacilli, however, were detected in any of them at the end of 12 months. This study demonstrated that 12 months after a single dose of ROM granuloma cleared in 85% of the patients and AFB were absent in all of them.

EBENEZER, G.J., DANIEL, E. Pathology of a lepromatous eye. **Int. J. Lepr.**, v.68 n. 1, p.23, 2000.

Histopathological examination of an enucleated eye from a lepromatous leprosy patient showed the cornea, ciliary body and part of the choroid to be infiltrated by macrophages filled with *Mycobacterium leprae*. The walls of blood vessels in the sclera, ciliary body and the anterior choroid demonstrated the presence of *M. leprae*, giving credence to the blood-borne entry of *M. leprae* into the eye. Unlike the eyes of experimental animals infected with *M. leprae*, histopathological study of this eye from a lepromatous leprosy patient demonstrated that *M. leprae*, although demonstrable in the anterior choroid, could not be found in the posterior parts of the eye, substantiating the claim that leprosy does not affect the posterior parts of the eye directly.

NADKARNI, N.S., REGE, VL. Significance of histopathological classification in leprosy. **Indian J. Lepr.** v.71, n.3, p.325,1999.

A retrospective blind study was carried out on 2640 patients of leprosy to correlate the histopathological and clinical classification of leprosy using the criteria laid down by Ridley and Jopling. There was complete agreement between histopathological and clinical classification in 81.8% of the cases, with one step deviation in 5.1% of the cases. Histopathological diagnosis of indeterminate leprosy in high percentage (15.9%) as against 3.3.% of indeterminate leprosy clinically in our series was an interesting feature.

Type-wise correlation between histopathological with clinical classification was very high, it being the highest in LL (98%) followed by TT (97%), BT, BB and BL (95%, 89% and 87% respectively).

PREVENÇÃO e CONTROLE PREVENTION and CONTROL

AHMES, J.U. Report of the national Leprosy elimination campaign (NLEC) of Bangladesh, 1999. **Lepr. Rev.**, v.70, n.4, p.472, 1999.

A national leprosy elimination campaign (NLEC) was implemented country-wide in all the 64 districts of Bangladesh for 6 days from 7 to 12 February 1999. The campaign was jointly funded by the Government of Bangladesh (GOB)/ World Bank (US\$250,000) and the remaining US\$381,000 was provided by other international non-governmental organizations (NGOS). A total of 44,400 health Workers and community volunteers were directly involved in the campaign. In all, 60,878 suspected leprosy cases were identified during the campaign, of whom 31,433 were examined and 2435 were confirmed as leprosy cases. The remaining suspects are expected to be examined within the next 2 months.

Details of the new cases detected are given in Table 8. The impact of NLEC has been significant, the number of cases detected during NLEC being 20% of the annual case detection in 1998.

About 52% of the total population were directly contacted through a rapid house-to-house survey and over 90% of the population was targeted through extensive use of electronic/print media and various information, education and communication (IEC) activities.

BARAL, J.P., BHATTARAI, S., THAPA, M.R. et al. Effectiveness of training of basic health workers in Leprosy control programme. **Indian J. Lepr.**, v.70, p.23s, 1998. Supplement.

This study was undertaken in two adjacent districts (Rautahat and Parsa) in Nepal to measure the impact of training of basic health workers on Leprosy Control Programme. Knowledge, attitude and leprosy service delivery by them were studied before and after training. There was an improvement in all the three components after training. However, improvement was also seen in the control group as well. Possible reasons for this are discussed. Improper selection of the area and an inadequate methodology were the identified drawbacks of the study.

BHATKI, W.S., SINGH, M.G. Modified Leprosy elimination campaign in Mumbai (Bombay), India a report. **Lepr. Rev.**, v.70, n.4, p.459, 1999.

With appropriate planning and preparation, a

modified leprosy elimination campaign (MLEC) was undertaken in Brihan Mumbai (Bombay), which has a population of around 11 million. For the campaign, 4879 non-leprosy paramedical and non-medical personnel were trained and utilized as searchers. The MLEC revealed 1410 new leprosy cases, with a new case detection rate of 1.83/10,000.

Over 80% of all cases detected were either single lesion or paucibacillary (PB), and thus of limited significance with regard to transmission. Further efforts are required to detect and treat cases of consequence (those with more than five lesions and those with positive skin smears) and to identify reservoirs of infection.

BRAHMACHARI, N.S.R., ANANTHARAMAN, D.S., RAO, B.R. et al. Underutilization of the available services by the needy disabled Leprosy patients in government Leprosy control unit puttoor, chittoor district, Andhra Pradesh, South India. **Indian J. Lepr.**, v.70, p.47s, 1998. Supplement.

This study was undertaken to find out the deformity profile, utilization of disability care services, factors associated with underutilization and the impact of educating leprosy patients with visible disabilities in selfcare practices in the area covered by the LCU Chittoor. The disability prevalence rate in the area was 15 per 10,000 population. Training of the staff and teaching leprosy patients in self-care practices has shown a remarkable improvement in skin texture and ulcer situation of disabled leprosy patients.

CHEN, X.-S., LI, W.-Z., JIANG, C. et al. Prediction of elimination of Leprosy in Leprosy endemic areas of China. **Indian J. Lepr.**, v.71, n.2, p.189, 1999

A study was carried out based upon the data from the National System for Leprosy Surveillance and using appropriate mathematical models. The results showed that of 337 counties where the national goal of basic eradication of leprosy had not been reached and in 40 counties where the WHO goal of leprosy elimination had not been achieved in 1996, the detection rates in calendar years followed exponential models with significant goodness-of-fit. In the 67 counties with downward trends of detection rates, the national goal can be met in terms of detection rate in 6% of counties before the year 2000 or 34.4% before the year 2010, or, in terms of prevalence rate in 31.3% before the year 2010. In the 11 counties with downward trends of the detection rates, the WHO target can be met in eight to ten counties within th is century when the duration of disease was determined with the WHO definition. If the MB proportion among

new cases increased by 10%, the target would be met one year later. However, at the same MB proportion, the change of fixed treatment schedules from PB six months and MB two years to PB nine months and MB three years will cause achievement of the goal to be postponed by two to ten years.

DEENABANDHU, D.A., NARENDRA BABU, C.R., VIJAYAKUMARAN, P. Study of the problem of hidden cases of Leprosy among "inaccessible" section of urban population in Madras City. **Indian. J. Lepr.**, v.70, p.79s, 1998. Supplement.

A questionnaire survey was conducted amongst 1300 general practitioners (GPs) of Madras city to assess the magnitude of leprosy problem amongst the upper middle class and upper class populations who are getting treatment from these GPs. A total of 2944 leprosy patients were being treated by 200 GPs. One third of these patients belonged to the upper middle / upper class section of the population living in the city of Madras.

DHARMSHAKTU, N.S., BARKAKATY, B.N., PATNAIK, P.K. et al. Progress towards elimination of leprosy as a public health problem in India and role of modified Leprosy elimination campaign. **Lepr. Rev.**, v.70, n.4, p.430, 1999.

India (population 943 million) has seen a highly significant decrease in the prevalence of leprosy since the introduction of multi-drug therapy (MDT) in 1981. From a prevalence rate of 57/10,000 of the population in March 1981, the figure has declined to 5.2/10,000 in March 1999. This was possible due to the creation of a completely vertical (specialized) infrastructure for leprosy control in the 218 endemic districts of the country and skeleton vertical staff in the remaining districts, coupled with the recruitment of additional staff on contract basis to provide MDT through vertical staff in endemic districts and mobile treatment units in the moderate and low endemic districts. Despite all efforts, however, new case detection has not shown a decline over the last 14 years due to the presence of hidden (and undiagnosed) cases.

Therefore, in order to intensify and hasten progress towards elimination (less than 1 case per 10,000 of the population) in the whole country, it was decided to implement a massive leprosy elimination campaign (LEC) in all the States/Union Territories (UTS). The reports of 22 States/UTS indicate that 415 out of the total of 490 districts in the country were covered by modified LEC (MLEC), with 85% coverage of the population. The campaign used in India was modified from the pattern previously described by the World Health Organization.

The detection of hidden or suspected cases took place within a short, intensive period of 6-7 days and relied heavily on house-to-house searches by General Health Care staff trained in leprosy detection and confirmation was made by appropriately trained staff. This MLEC received widespread Government and public support, resulting in the detection of 454,290 hidden cases of leprosy, whilst providing training to a large number of General Health Care staff and volunteers and creating widespread awareness about leprosy and the availability of treatment free of charge for all cases. This programme proved to be one of the most successful health care interventions undertaken in India in recent years, particularly in the states of Bihar and Orissa. Although a few states in India are unlikely to reach the current WHO goal of elimination before end of the year 2000, the results of the MLEC strongly support the possibility that elimination levels will be achieved in the majority of states by the end of the year 2000 and at national level by the end of the year 2002.

HERNÁNDEZ RAMOS, J.M. Proyecto Araguaia del Brasil: algunos datos significativos. **Fontilles - Rev. Lepr.**, v.22, n.3, p.257, 1999.

The Araguaya Project for the eradication of leprosy, started in 1997 in the northern state of Mato Grosso (Brazil) extensive and isolated part of the country is described. The total area covered by the project is approximately 75,000 km² and a population estimated in 34,000. The work was carried out mainly in 3 villages: São Félix do Araguaia, Santa Terezinha and Porto Alegre do Norte. The number of multibacillary cases (59.8%) is greater than the paucibacillary (40.2%) with 109 and 73 patients respectively and 76 new cases detected this year and a detection rate of 19.8 cases/10,000 population. The prevalence rate is 53.8/10,000 population, indication of a very endemic area. The incidence of leprosy in children, less than 14 years is very high with 11 cases/10,000 population. The project will continue under the management and supervision of the work by the Fontilles medical staff.

MANDAL, M.G., PAL, D., MAJUMDAR, V. et al. Recent trends in Leprosy in a large district of West Bengal, India, revealed by a modified Leprosy elimination campaign (MLEC), 1998. **Lepr. Rev.**, v.71, n. 1, p.71, 2000.

A Modified Leprosy Elimination Campaign (MLEC) in September 1998 in the District of Midnapore, West Bengal, covered a population of 8.1 million people and detected 8181 new cases. Available data from 7328 cases

were studied to observe the trend for leprosy in this area. Data are presented on sex and age distribution, classification and the proportions of multibacillary (MB), paucibacillary (PB) and single skin lesion (SSL) cases discovered in a period of only 8 days. The large numbers of people examined in this district and the high total of new cases revealed are in keeping with experience in other parts of the State and in other parts of India.

However, many cases were found in endemic areas and these will receive special attention in a second MLEC, planned for January 2000.

MEIMA, A., GUPTE, M.D., OORTMARSSSEN, G.J. et al.

SIMLEP: a simulation model for Leprosy transmission and control. *Int. J. Lepr.*, v.67, n.3, p.215, 1999.

SIMLEP is a computer program for modeling the transmission and control of leprosy which can be used to project epidemiologic trends over time, producing output on indicators such as prevalence, incidence and case detection rates of leprosy. In SIMLEP health states have been defined that represent immunologic conditions and stages of leprosy infection and disease. Three types of interventions are incorporated: vaccination, case detection and chemotherapy treatment. Uncertainties about leprosy have led to a flexible design in which the user chooses which of many aspects should be included in the model. These aspects include natural immunity, asymptomatic infection, type distribution of new cases, delay between onset of disease and start of chemotherapy, and mechanisms for leprosy transmission. An example run illustrates input and output of the program.

The output produced by SIMLEP can be readily compared with observed data, which allows for validation studies. The support that SIMLEP can give to health policy research and actual decision making will depend upon the extent of validation that has been achieved. SIMLEP can be used to improve the understanding of observed leprosy trends, for example, in relation to early detection campaigns and the use of multidrug therapy, by exploring which combinations of assumptions can explain these trends. In addition, SIMLEP allows for scenario analysis in which the effects of control strategies combining different interventions can be simulated and evaluated.

MERLIN, V.E., MICELI, I., LITTURI, M. et al. Factors that make difficult the implementation of an integrated Leprosy control programme in health zone II, Santa Fe Province, Argentina, *Indian J. Lepr.*, v.70, p.83s, 1998. Supplement.

With the help of a pre-tested, structured questionnaire and participatory observation, effects of several variables that have a bearing on the process of integration were studied in Zone II of the Santa Fe Province of Argentina. Patient's knowledge and the presence of an NGO were identified as factors facilitating integration. The presence of a vertical programme staff and insufficient commitment towards integration were identified as factors hindering integration.

NAIK, S.S., GANAPATI, R., Impact of MDT on Leprosy prevalence as judged by surveys in the "Megacity" of Mumbai. *Indian J. Lepr.*, v.71, n.2, p.217, 1999.

While whole population surveys are a regular feature of the National Leprosy Control Programme in rural areas, such surveys were not attempted till 1970 in the "megacity" of Mumbai (previously known as Bombay), in view of the immensity of the task involved in covering a vast population.

Urban leprosy control essentially consisted of conducting clinics mostly confined to leprosy hospitals, supported by patchy community health education. The estimates of prevalence of active leprosy cases were therefore crude as these were derived from figures available in clinics and not from the field. Ganapati and Naik estimated in 1974 that Mumbai could have a prevalence rate (PR) of about 63 per 10 000 as approximately 50 000 active cases were believed to have been registered at the Acworth Leprosy Hospital and its nine peripheral clinics.

Reports on easily surveyable captive population groups such as school children were first available in 1969. The findings were reviewed by Ganapati et al in 1973 and it was pointed out that the existence of possible endemic pockets was identifiable through the technique of school surveys (Ganapati et al 1976). Total population surveys of slum population were carried out for the first time in 1974 and reported by Ganapati et al (1977). Figures from special population groups such as in patients of general hospitals (Ganapati et al 1980) and leprosy colonies (Ganapati et al 1985) were subsequently available. As night schools were a peculiar feature in Mumbai, surveys of these institutions were undertaken for the first time (Naik et al 1990) and results revealed a higher prevalence of leprosy and in particular progressive forms of the disease than that revealed by school surveys

OGBEIWI, O., NASH, J. What would make your life better? A needs analysis of Leprosy settlements in the middle belt region of Nigeria. **Lepr. Rev.**, v.70, n.3, p.295. 1999.

A needs analysis using rural appraisal and matrix ranking techniques was done in six leprosy communities in the middle belt region of Nigeria. Asked what would make their life better? Whole village groups were made to list, prioritize and rank their expressed needs by voting in a matrix table drawn on the ground. Out of a total of 504 votes, 31% was for health care or drugs for their general ailments, 23.6% for money and less than 10% for other needs that ranged from water, trade and housing to love and, least, mobility aids. Health care was prioritized in all communities but got the highest votes in three communities, money got the highest in the only two communities where it was prioritized and water in one. The need ranked the highest in each settlement seemed to be a reflection of its peculiar socio-economic situation. Apart from the similar priorities of health care and money, men's differing priorities were water, housing, clothes and assistance with farming, and women's, school fees for children, family, trade and food. These reflect their different traditional roles. Considering the variety of needs we think that there is no one solution to rehabilitation in the Nigerian context, but the situation and context of individual settlements should be considered, looking at general health care, income generation or loans schemes, schooling and water supply.

PATNAIK, P.K.B. Modified leprosy elimination campaign (MLEC) in the State of Orissa, India. **Lepr. Rev.**, v.70, n.4, p.440, 1999.

As part of a country-wide modified leprosy elimination campaign (MLEC) carried out in 21 selected States in India in 1998, the State of Orissa launched activities in early January of that year, during which 28.9 million people were examined, giving 85% coverage of the enumerated population. Using general health care staff and volunteers, 416,604 suspect cases were identified and 62,804 of these were confirmed as leprosy by experience observers. The period of intensive search activity lasted 1 week only, but this was preceded by several months of community mobilization and involvement, health education, training of government and voluntary staff, media messages and the involvement of all relevant health departments, officials and politicians. Both this and the intensive search period were characterized by a high level of interest and cooperation by all concerned. The total of new cases detected and put on treatment (multi-drug therapy; MDT) during the period

of only 7 days was approximately equal to that which, on routine population survey by the leprosy services, would be recorded over a period of 2 years. The MLEC in Orissa is judged to have been not only an historic step forward in the control of leprosy in a State previously classified as highly endemic for leprosy, but also one of the most successful State health interventions ever mounted. In the 5 months after completion of the campaign, the voluntary reporting rate increased from 50 to 90%.

As a direct result of the campaign, facilities for the diagnosis and treatment of leprosy are now available daily in an additional 1639 institutions, over and above those in existence before the campaign was launched. The achievements in terms of detecting hidden (and thus undiagnosed and untreated) cases exceeded the outset predictions, underlining the importance of continued vigilance and the need to maintain involvement of general health care staff. It is anticipated that the rise in prevalence due to the addition of 62,884 cases will be reduced by the implementation of MDT by 80% by about March 1999. Overall the results of the MLEC in Orissa strongly support the likelihood that an elimination level of less than 1 case per 10,000 of the population will be reached in this State by the year 2000.

PEREIRA, E.S., CUNHA, M.G.S., MARÓJA, M.E. et al. Leprosy elimination campaign, Amazonas-Brazil 1997. **Lepr. Rev.**, v.71, n.1, p.77, 2000.

A leprosy elimination campaign (LEC) was carried out in 15 endemic areas of Amazonas State, Brazil, in 1997. The LEC concentrated effort to detect leprosy cases during a multi-vaccination national campaign for serious public health problems other than leprosy, such as polio, diphtheria, hepatitis, measles, etc. The national campaign involved intensive population mobilization, giving a valuable opportunity to examine people for leprosy. The LEC personnel included 2964 individuals (municipal and state health workers and community volunteers), distributed in 688 health units and 53 reference health centres. As a result of the LEC, 74,814 person-to-person communications in the community were given; 10,297 clinical skin examinations were conducted, and 40 new leprosy cases were detected on the day of the campaign in urban areas of the municipalities. This total was low, compared to results in other states of Brazil, possibly due to the development of health education activities and regular community services in the state of Amazonas since 1987 and to the early implementation of WHO multiple drug therapy (MDT) from 1982 onwards. Despite the fact that the LEC was carried out only in the urban areas of the municipalities, the finding of no cases of leprosy in 7 out of 15 of them was surprising and may indicate that the

prevalence of hidden cases of leprosy is not all that high, at least in these areas of the Amazonas State.

SMITH, W.C.S. Future scope and expectations: why, when, and how LECs should continue. **Lepr. Rev.**, v.70, n.4, p.498, 1999.

There is a strong case to continue to use LEC approaches, as they are a comprehensive and cost effective means of delivering the key elements of leprosy control. LECs should be conducted when there is evidence of large numbers of hidden cases. Probably a minimum of two LECs is required but where large number of new cases continue to be detected they could be run on an annual basis. The methodology of LECs needs to be improved through experience, evaluation and from LECs conducted elsewhere; feedback from the community is also important. There is room to improve all aspects of LECs planning, training, education, diagnosis and, treatment completion

TIENDREBÉOGO, A., SOW, S.O., TRAORE, M. et al. Comparison of two methods of Leprosy case finding in the circle of Kita in Mali. **Int. J. Lepr.**, v.67, n.3, p.237, 1999.

Kita is a health district of Mali, a leprosy-endemic country in West Africa. We conducted a comparative study of passive and active case finding of leprosy in this district in 1997. In May and June, a mobile team realized active case finding by visiting 32 villages of more than 1000 inhabitants. For 12 months, peripheral health center nurses did passive detection after information and education sessions about the signs of leprosy in the other 37 main villages of Kita. The active detection rate (4.31 per 10,000) was threefold higher than the passive rate (1.5 per 10,000) and allowed us to find earlier cases of leprosy. Active case finding identified children and single-lesion disease; the passive method did not. Cost for finding a new case was estimated at 72 US\$ by mobile team detection and 36 US\$ by passive case finding. Although the active method looked more expensive than the passive one, it was the only effective strategy to detect leprosy patients in remote and difficult-to-access areas. Based upon the results of the study, a flow chart is proposed for the choice of case-finding method when designing a leprosy elimination program.

VIJAYAKUMARAN, P., PRABHAKAR RAO, T., KRISHNAMURTHY, R. Pace of leprosy elimination and support teams in Bihar State, India. **Lepr. Rev.**, v.70, n.4, p.452, 1999.

Despite the extensive implementation of multiple drug therapy (MDT) in most leprosy-endemic countries world-wide since 1982, bringing about a remarkable reduction in prevalence, there are still regions at the subnational level where the implementation of MDT remains difficult. The state of Bihar (population 86.3 million) in India is a good example of such a region. Previously rated as one of the most highly endemic states, it still contributes about 21% of the total caseload in India and about 12% of the global caseload. For various reasons, case-finding and drug treatment have lagged behind the progress made in most other states in the country and in 1996, the Damien Foundation India Trust (DFIT) volunteered technical support to increase the pace of elimination. Sixteen out of the 39 districts in the state were allocated, with a population of 41.8 million. Support teams, including a Medical Advisor and a Non-Medical Supervisor, both with over 10 years experience of leprosy work and control programmes, were provided to assist and work alongside government staff in case detection, treatment delivery, case-holding and discharge in their respective areas of operation. New case detection by intensive survey increased by 394% and total new case detection by 226% during the year 1996-1997, with similar trends in the following year. Striking improvements were also observed in MDT coverage, treatment regularity, monitoring and discharge of patients and in the training of local staff. This collaboration between a non-government agency (DFIT) and the staff of the National Leprosy Eradication Programme in 16 out of 39 districts in the State of Bihar has clearly been extremely successful. Similar approaches in the remaining districts of Bihar, and in other parts of India, where the infrastructure is available but inadequate, may contribute significantly to achieving the elimination goal at national and sub-national levels.

ZODPEY, S.P., BANSOD, B.S., SHRIKHANDE, S.N. et al. Protective effect of Bacillus Calmette Guerin (BCG) against Leprosy: a population-based case control study in Nagpur, India. **Lepr. Rev.**, v.70, n.3, p.287, 1999.

A population-based pair-matched case-control study was carried out in an urban community, Nagpur, India, to estimate the effectiveness of BCG vaccination in the prevention of leprosy. The study included 212 cases of leprosy (diagnosed by WHO criteria), below the age of 35 years, detected during a leprosy survey conducted by the

Government of Maharashtra over a population of 20,03,325. Each case was pair-matched with one neighbourhood control for age, sex and socioeconomic status. A significant protective association between BCG and leprosy was observed (OR=0.40, 95% CI=0.23-0.68). The overall vaccine effectiveness (VE) was estimated to be 60% (95% CI = 32-77). The BCG effectiveness against multibacillary and paucibacillary leprosy was 72% (95% CI = 35-88) and 45% (95% CI = 3-73), respectively. Vaccine was more effective during the first decade of life among females and in lower socioeconomic strata overall prevented fraction was 39% (95% CI = 16-58). In conclusion, this first ever population-based case control study performed in Central India, identified a beneficial role of BCG vaccination in prevention of leprosy in study population.

REABILITAÇÃO - REHABILITATION

BRAKEL, W.H.V., ANDERSON, A.M., WORPEL, F.C. et al. A scale to assess activities of daily living in person affected by Leprosy. *Lepr. Rev.*, v.70, n.3, p.314, 1999.

The aim of this study was to develop a scale for identifying disability among people in the rural areas of developing countries. The studies were carried out in the Green Pastures Hospital and the leprosy field programme of the Western Region of Nepal. With the help of staff experienced in working with people with disability, a 68-question questionnaire was made, based on the International Classification of Impairment, Activities and Participation (ICIDH - 2). A survey was carried out of 269 people affected by leprosy who had impairments, as well as a sample of those who were unimpaired. The survey results were used to develop the questionnaire into a scale, using standard scale development methods. This included checking of criterion validity, discrimination and reliability using weighted kappa statistics. Of the 68 questions, 38 were included in the second draft of the instrument. Eight questions were added to identify difficulty in relationships, about the use of aids and about occupation and employment. The sum score of the scale against the expert score gave a Spearman correlation coefficient of 0.72.

Intra- and inter-interviewer reliability coefficients were 0.77 (95% CI 0.73-0.81) and 0.61 (95% CI 0.56-0.67), respectively. The stability test gave an overall kappa of 0.76 (95% CI 0.70-0.82). Four questions with particularly poor results were omitted from the final draft of the instrument. An interview-based instrument was developed for identifying limitations in activities of daily living (disability) in people living in a rural setting in a

developing country - the Green Pastures Activity Scale (GPAS). The scale performed well during validity and reliability testing. It consists of 34 activity questions, five relationship questions, and three questions on the use of aids, occupation and employment.

CHOUDHURI, H., THAPPA, D.M., KUMAR, R.H, et al. Bone changes in Leprosy patients with disabilities/deformities (A clinico-radiological correlation). *Indian J. Lepr.*, v.71, n.2, p.203, 1999.

One hundred and ten leprosy patients (96 males and 14 females, mean age 45.3 years) with disabilities/deformities were examined, radiologically to evaluate bone changes and correlating them with clinical parameters.

Most patients (98) had paucibacillary leprosy. The mean duration of leprosy was 7.4 years and that of deformity was 4.1 years. Ten patients presented with reaction. Seventy-five (68.2%) patients had received a full course of anti leprosy treatment. The overall prevalence of bone changes was 87.3% (96 patients); non-specific, osteoporotic and facial changes were seen in 44.5%, 75.5%, 38.2% and 9.1% of the patients respectively. Among the specific bone changes, primary periosteitis (28.2%) and "bone cysts" (22.7%) were the more common findings. Among the non-specific bone changes, terminal phalangeal absorption (48.2%), soft tissue changes (44.5%) and concentric absorption (32.7%) were more common. Specific bone changes showed a significant ($P<0.05$) increase with lack of or incomplete antileprosy treatment. Non-specific bone changes showed significant correlation ($P<0.05$) with increasing duration of disease, lack of or partial treatment and rising disability index. Osteoporotic changes showed a significant relationship with rising disability index.

JOSHI, REVANKAR, C.R. Improving compliance of Leprosy patients with disabilities for disability care and prevention of disability services. *Indian J. Lepr.*, v.70, p.39s, 1998. Supplement.

This study was undertaken to identify the extent of the problems such as inadequate disability prevention services and poor compliance of the disabled leprosy patients and also to develop solutions, in Ulhasnagar block of Thane district, Maharashtra, India. A total of 233 patients out of 269 non-colony patients were evaluated before and after the intervention. The interventions consisted of staff training, educating the patient and his family and provision of supplies and aids. Almost all patients complied with the given advice and were using the aids provided. Improvement was noted in physical,

social and disability status. About 25% indicated that they could now undertake activities of daily life and 43% stated that they could attend to their vocation. Substantial improvement in service providers knowledge and skill was observed. Long-term follow-up is necessary to determine the sustainability of results.

PATOND, K.R., BETAL, B.D., GAUTAM, V. Results of thumb correction in Leprosy using different techniques. *Indian J. Lepr.*, v.71, n.2, p.155, 1999.

Forty-four hands of 42 leprosy patients with paralysis of intrinsic muscles of the hand were treated by opponensplasty using ring finger superficialis (FDS4) or extensor indicis proprius (EIP). Superficialis tendon of middle finger was also used in these hands for lumbrical replacement by "direct lasso" operation. Low ulnar paralysis with Froment's sign was corrected by transfer of radial half flexor pollicis longus (FPL) to extensor pollicis longus (EPL). Results of thumb correction were assessed and analysed in 37 hands of 35 patients. The mean follow-up period was 19 months. Best results were found with transfer of half FPL to EPL. Results of FDS transfer was good in 12 out of 16 manual workers. EIP transfer worked well, but the power of the thumb and patients' satisfaction was less.

TERAPÉUTICA — THERAPEUTIC

CHEN, X.S., LI, W.Z., JIANG, C.C., et al. Studies on risk of leprosy relapses in China: relapses after treatment with Dapsone Monotherapy. *Int. J. Lepr.*, v.67, n.4, p.371, 1999.

Based upon the data from the Chinese National System for Leprosy Surveillance, this paper reports on the relapses in 297,343 leprosy patients [multibacillary (MB) 106,518, paucibacillary (PB) 190,825] cured by dapsone monotherapy. A total of 11,055 (MB 8675, PB 2380) patients relapsed during an accumulated follow-up period of 4,229,050 patient-years (PY), giving an overall relapse rate of 3.72 per 100 cases or 2.61 per 1000 PY, i.e., 8.14% or 5.91 per 1000 PY over an average follow-up period of 13.8 ± 8.4 years in MB patients and 1.25% or 0.86 per 1000 PY over an average period of 14.5 ± 8.9 years in PB patients.

For either the overall relapse rate per 100 cases or per 1000 PY, the differences between MB and PB patients were statistically significant, except during 36-40 years of follow up. For both MB and PB patients, the relapse rates showed consistently significant decreases year by year, particularly in PB patients whose relapse rate per 1000 PY was 1.21 in year 10 of follow up; whereas it remained

more than 10 per 1000 PY in MB patients. In view of that, the overall relapse rates in MB and PB patients cured by dapsone monotherapy were acceptably low, and most of these patients have been followed up for more than a mean incubation period of observed dapsone relapse. Along with the further extension of follow up, the risk of relapse in dapsone-cured patients will not be expected to increase. This conclusion should be considered when planning policy for the management of patients released from dapsone monotherapy.

CHEN, X.S., LI, W.Z., JIANG, C. et al. Studies on risk of Leprosy relapses in China: relapses after treatment with multidrug therapy. *Int. J. Lepr.*, v.67, n.4, p.379, 1999.

Based upon the data from the Chinese National System for Leprosy Surveillance, this paper reports on the relapses in 47,276 leprosy patients cured by or released from WHO-recommended multidrug therapy (WHO/MDT). The overall relapse rate was 0.73/1000 patient-years (PY). There was a statistically significant difference in the relapse rates of WHO/MDT-MB (0.61/1000 PY) and WHO/MDT-PB (1.04/1000 PY) ($\chi^2 = 15.7$, $p < 0.01$) patients. For multibacillary (MB) patients, the relapse rate in patients treated with fixed-duration MDT (0.56/1000 PY) was comparable with that in patients treated with MDT until skinsmear negativity (0.73/1000 PY) ($\chi^2 = 2.20$, $p > 0.05$). Our present study suggests that fixed-duration MDT is a cost-effective regimen for the treatment of leprosy in China. The present results also show that relapse of leprosy is acceptably low and has not yet become a serious clinical or public health problem but, based upon the incubation of relapse in MDT patients, it is necessary to encourage annual follow up for at least 5 years for paucibacillary (PB) and 10 years for MB patients after being released from WHO/MDT.

GILLIS, T.P., WILLIAMS, D.L. Dapsone resistance does not appear to be associated with a mutation in the dihydropteroate synthase-2 gene of *Mycobacterium leprae*. *Indian J. Lepr.*, v.71, n. 1, p. 11, 1999.

Evidence suggests that resistance to dapsone (DDS) in *Mycobacterium leprae* is related to the enzyme dihydropteroate synthase (DHPS). Two *M. leprae* genes (folP-1 and folP-2) encoding DHPS-1 and DHPS-2, respectively, have been identified through the *M. leprae* genome project. We have studied DDS-susceptible and resistant strains of *M. leprae* to determine whether the DDS-resistant phenotype is associated with a mutation(s) in folP-2 and to establish the number of genomic copies of the gene encoding DHPS-2 (folP-2). RFLP analysis of

genomic DNA from DDS-susceptible and resistant strains of *M. leprae* exhibited a unique 4.2 kb restriction fragment consistent with a single genomic copy of folP-2 in both phenotypes.

DNA encoding folP-2 was amplified by PCR and sequenced from two susceptible and two resistant strains of *M. leprae*. The folP-2 sequences from these strains were identical indicating that resistance to DDS was not associated with mutation(s) in the gene encoding DHPS-2.

KATOCH, K., NATARAJAN, M., KATOCH, V.M. et al. Chemotherapy trial in paucibacillary leprosy using clofazimine. **Indian J. Lepr.**, v.71, n.3, p.311, 1999.

In a double blind study, 300 PB patients (smear negative, indeterminate, tuberculoid and borderline tuberculoid) were randomly allotted to two regimens, the control subjects (150 patients) receiving the standard WHO multidrug regimen of six doses of once a month rifampicin with daily dapsone therapy for six months, while the study group (150 patients) receiving 50 mg of clofazimine daily for six months in addition to the WHO regimen. After stoppage of therapy all the patients were followed up on placebo. The regimens were well tolerated. In 7.5% of patients on clofazimine containing regimen, the lesions showed persisting activity at the time of stoppage of therapy, compared with 16% on the control regimen. This activity subsided spontaneously, more rapidly, in the study group (80% compared with 30% in the control group) in six months. Two patients in the control group and one patient in the study group developed late reaction. There were no relapses in the study group, whereas, two patients have relapsed in the control group during a follow-up of 2.5 to 3.5 years.

MANANDHAR, R., LEMASTER, J.W., ROCHE, P.W. Risk factors for erythema nodosum leprosum. **Int. J. Lepr.**, v.67, n.3, p.270, 1999.

A retrospective study of new borderline lepromatous and lepromatous patients reporting for multidrug therapy (MDT) for leprosy at the Anandaban Leprosy Hospital, Kathmandu, Nepal, over an 8-year period was conducted to determine the prevalence of erythema nodosum leprosum (ENL), the time and frequency of reactions, and clinical and laboratory parameters associated with ENL. An overall prevalence of ENL in this cohort of 19% was found. One third of these reactions occurred in patients before MDT was given, one third in the first 6 months and one third after 6 months of treatment. Nearly 1 in 10 of the ENL reactions occurred in

patients who had completed 2 years of MDT; 45% of patients with ENL had more than one episode. Data collected at the patients first presentation was used to identify four major risk factors.

Patients with lepromatous disease, skin infiltration or a bacterial index (BI) of >4+ were at significantly increased risk. Patients older than 40 were at significantly decreased risk of ENL. There was a linear relationship in the risk of ENL with an increasing BI and an inverse relationship to increasing age. These observations should enable clinicians to recognize patients at first presentation who will be likely to develop ENL.

RAO, B.R., KRISHNAMURTHY, P A comparative study of the cost and effectiveness of a modified system of MDT Drug delivery system in a high endemic district (Nalaagonda) of south India. **Indian J. Lepr.**, v.70, p.63s, 1998. Supplement.

Fall in the case load (from 17,000 to 4,500), has changed the disease profile and introduction of fixed duration Therapy (FDT) has made management of leprosy cases rather easy in Nalgonda, a backward district in Andhra Pradesh. The system of drug delivery which was conceived for managing large case load, however, remains unchanterebly resulting not only in considerable wastage of resources but also in hampering other activities like case detection and patient care. This study was undertaken to develop and assess a modified system of drug delivery in terms of the cost and effectiveness, its overall effect on other activities in the programme and its acceptability by the field staff. Four Leprosy Control Units 3 (LCUs) were selected and were randomly assigned either to study (Gudibanda, Suryapet) or control (Nalgonda, Bhuvanagiri) group. In the study group the modified drug delivery system replaced the existing system. The modified system consisted of the para medical worker being made responsible for patients at all the DDPS in his subcentre. The clinics were managed alternately by medical officers and non medical supervisors every month. In the control group each clinic was managed by medical officers every month and it covered two sub centers with each drug delivery point being assisted by a para medical worker.

The study revealed that the modified system resulted in a saving of 130 man-days a month, a 30% saving in use of vehicle, a 30% saving in POL and improvement in case detection. There was no change in the clinic attendance and drug consumption compliance in the units where modified system was introduced.

SELVARAJ, G., PRABAKAR, N., MULIYIL, J. et al. Incidence of disabilities among multi-bacillary cases after initiation of multidrug therapy and factors associated with the risk of developing disabilities. **Indian J. Lepr.**, v.70, p, 11s, 1998. Supplement.

Out of the 1724 new cases registered between 1985 to 1992, 1169 could be contacted. The overall incidence of disabilities was 6.8%. Age above 45 years, bacteriopositivity and thickening of three or more trunk nerves were associated with a higher risk of disabilities.

Staff training, patient education and steroid availability in the field were the suggested methods of reducing the occurrence of disabilities in leprosy patients.

SHARMA, P., KAR, H.K., MISRA, R.S. et al. Disabilities in multibacillary Leprosy following multidrug therapy with and without immunotherapy with *Mycobacterium w* antileprosy vaccine. **Int. J. Lepr.**, v.67, n.3, p.250, 1999.

A vaccine based on autoclaved *Mycobacterium w* was administered, in addition to standard multidrug therapy (MDT), to 157 bacteriologically positive, lepromin-negative, multibacillary leprosy patients supported by a well-matched 2 control group of 147 patients with similar type of disease who received a placebo injection in addition to MDT. The MDT was given for a minimum period of 2 years and continued until skin-smear negativity, while the vaccine/placebo was given at 3-month intervals up to a maximum of 8 doses in the initial 2 years. The overall incidence of type 1 and type 2 reactions and neuritis during treatment and follow up was nearly equal in the patients in the vaccine and placebo groups; the differences were not statistically significant. The occurrence of disabilities, such as anesthesia, trophic ulcers, claw hand and grade 3 deformities, were not different statistically in the vaccine and placebo groups, an observation valid both for deformities present at induction and for those which developed during the course of therapy and surveillance. A statistically significant difference was observed in the recovery of newly developed trophic ulcers; recovery was quicker in the vaccine group. The recovery rate for motor deformities was marginally higher in the vaccine group, although not significant ($p = 0.068$) statistically. There was a statistically significant reduction in the incidence of grade 3 deformities following MDT with and without immunotherapy. To conclude, the addition of vaccine to MDT did not precipitate neuritis or deformities over and above that encountered with MDT alone, although it did accelerate bacteriological clearance, histopathological upgrading, conversion to lepromin positivity, and clinical improvement.

SHARMA, P., KAR, H.K., MISRA, R.S. et al, Induction of lepromin positivity following immunochemotherapy with *Mycobacterium w* Vaccine and Multidrug Therapy and its impact on bacteriological clearance in Multibacillary Leprosy: report on a Hospital-Based Clinical trial with the candidate Antileprosy Vaccine. **Int. J. Lepr.**, v.67, n.3, p.259, 1999.

A vaccine based on autoclaved *Mycobacterium w* was administered, in addition to standard multidrug therapy (MDT), to 157 bacteriologically positive, lepromin-negative, multibacillary (LL, BL and BB) leprosy patients. The vaccinees were supported by a well matched control group of 147 patients with similar type of disease who received a placebo injection in addition to MDT. The MDT was given for a minimum period of 2 years and continued until skin-smear negativity, while the vaccine was given at 3-month intervals up to a maximum of 8 doses. The lepromin response evaluated in terms of percentage of subjects converting to positivity status, measurement in millimeters, and duration of lepromin positivity sustained, reflected a statistically significant better outcome in the vaccine group patients (especially LL and BL leprosy) in comparison to those in the placebo group. The data indicate that lepromin-positivity status seems to have an impact on accelerating the bacteriological clearance, as is evident by the statistically significant accelerated decline in the BI of those patients who converted to lepromin positivity as compared to those remaining lepromin negative throughout therapy and post-therapy follow up. To conclude, the addition of the *Mycobacterium w* vaccine to standard MDT induces a lepromin response of a statistically significant higher magnitude than that observed with MDT alone.

TRUMAN, R.W., GILLIS, T.P The effect of ultraviolet light radiation on *Mycobacterium leprae*. **Int. J. Lepr.**, v.68, n. 1, p. 11, 2000.

Ultraviolet (UV) light is recognized as a potent sterilizing aid, but its relative effectiveness against *Mycobacterium leprae* has not been shown. We examined the influence of UV on the growth and metabolic activity of *M. leprae* harvested fresh from foot pads of nude mice. Temporary static suspensions were exposed to timed intervals of UV radiation generated from a fixed source to constitute dosages ranging from $0-12.64 \times 10^1$ erg/cm². The metabolic activity of the bacilli was indexed by the oxidation of ¹⁴Cpalmitate in BACTEC 12-B vials. The long-term effects of irradiation on cell division and growth were assessed by inoculation of BALB/c mouse foot pads. The metabolic activity in BACTEC showed an immediate dose-response-related decline to a maximum of 50% of the

control activity after exposure to 6.3×10^1 erg/cm. Mouse foot pad studies showed a similar dose-response pattern. Effective-dose determinations based on metabolic or foot pad data were similar. UV doses of 3.52×10^1 erg/cm resulted in an average 50% killing, and 7.73×10^4 erg/cm killed 84% of the *M. leprae* exposed. This UV sensitivity is similar to that reported for *M. tuberculosis*. UV sterilization and disinfection practices suitable for *M. tuberculosis* are likely to be equally effective for *M. leprae*.

WANG, L.M., KIMURA, A., SATOH, M. et al. HLA linked / with Leprosy Southern China; HLA linked resistance alleles to Leprosy. *Int. J. Lepr.*, v.67, n.4, p.403, 1999.

According to the World Health Organization recommended multidrug therapy (WHO/MDT), we have carried out this study to investigate the presence of HLA linked susceptibility or resistance to leprosy in a southern Chinese population. Sixty-nine leprosy patients and 112 healthy controls participated in the study. HLA-DR2 subtypes, HLA-B and MHC Class 1 chain related A (MICA) alleles were typed at the DNA level using the polymerase

chain reaction-single strand conformation polymorphism method.

The frequencies of HLA-DR2-DRB1 alleles did not show any significant differences between the patients and the control groups, suggesting that the disease susceptibility was not associated with the DR2 subtypes in this southern Chinese population. On the other hand, in the multibacillary (MB) patients significantly decreased allele frequencies of HLA-B46 (0.040 in MB patients vs 0.129 in controls) and MICA-A5 (0.200 vs 0.380) were observed compared with the healthy controls. The calculated relative risk (RR) for B46 was 0.28; for MICA-A5, 0.52. In addition on haplotype analysis the frequency of the HLA-B46/MICA-A5 haplotype was significantly decreased in the MB patients compared to controls (0.060 vs 0.233, RR = 0.22, $p < 0.01$).

These results suggest that an HLA-linked disease resistant gene to MB leprosy in southern China is in strong linkage disequilibrium with the HLA- B46/MICA-A5 haplotype. In other words, the resistant gene may be located near the HLA-B/MICA region and not in the HLADR locus.