

RESUMOS/ABSTRACTS

CLÍNICA

ABBOT, N.C., TERCENIO, J., FERRELL, W.R., TORRES, P., WILSON, M.G., LOCKHART, J.C., QUINTANA, M.V., GIMENO, V., BECK, J.S., LÓPEZ Pla, J. Perfusion "Doppler" con laser infrarrojo y cercano al rojo en manos de pacientes de lepra en España. *Rev. Leprol Fontilles*, v. 20, n. 3, p. 847, Septiembre-Diciembre, 1995.

Se ha empleado una nueva técnica de perfusión Doppler con Láser a las longitudes de onda, rojo (633 nm) y cercano al rojo (780 nm) para obtener imágenes del flujo sanguíneo en los dedos de pacientes de lepra y voluntarios sanos en el Sanatorio de Fontilles. La técnica permite medir el flujo en las estructuras dérmicas y sub-dérmicas y podría ser útil para localizar deterioro microcirculatorio. Se pueden medir niveles muy elevados de riego en la pulpa de los dedos a la temperatura ambiente de Fontilles (23-26.° C), ya que debido a una abundante anastomosis arteriovenosa, desempeñan un papel termorregulador. Sin embargo en muchos pacientes, incluyendo los que no presentan un compromiso clínico en las manos, el riego sanguíneo y temperaturas cutáneas estaban significativamente reducidas, confirmando hallazgos previos en pacientes de lepra en India e Irán. Los hallazgos preliminares indican que estas disminuciones de riego no están localizadas a una región anatómica pero pueden afectar todos los dedos evaluados de un individuo sugiriendo un deterioro más generalizado de la función termo regulatoria. Mientras que esto puede implicar un mecanismo central, también se podría explicar por una vasculitis sub-crónica continua de los dedos. Nuestros trabajos anteriores indicando una asociación entre pérdida de sensación y reducción del flujo sanguíneo, también sugieren factores neurales como una depleción de

BROWN, T.R., KOVINDHA, A., WATHANAKI-LIKKOL, U., PIEFER, A., SMITH, T., GRAFT, G.H. Leprosy neuropathy: correlation of clinical and electrophysiological tests. *Indian J. Leprosy*, v. 68, n. 1, p. 1-12, 1996.

This report describes the neurological and electrophysiological examination of 35 subjects with leprosy (average duration of symptoms 3.4 years, average time since diagnosis 7.5 months). Clinical examination in the distribution of non-dominant median and ulnar nerves was performed with the following clinical methods: touch sensation with 0.05 gm. monofilament nylon, thermal sensation with a thermal sensitivity testing device, voluntary muscle testing and nerve palpation. At least one abnormality was found in 22 ulnar and 13 median nerves (63% and 37%, respectively). Nerve palpation was the most frequent clinical abnormality, while the other methods had similar frequencies of abnormality.

Electrophysiological studies were performed on the ipsilateral side of the leprosy subjects and on 32 age-matched normal subjects. Electrophysiological responses from the leprosy subjects were evaluated by criteria established from normal subject data. Abnormal or absent responses were found in 21/35 ulnar sensory, 12/35 ulnar motor, 9/35 median sensory and 6/35 median motor responses among the leprosy subjects. The most important electrodiagnostic findings were: (i) low sensory amplitudes and (ii) drops in amplitude and NCV over the across-elbow segment of the ulnar nerve. Both clinical and nerve conduction abnormalities were positively associated with duration of leprosy symptoms.

The four clinical methods were compared for concordance with nerve conduction data by cross-tabulation. The two sensory measures, monofilaments and the thermal sensitivity device, had the highest concordances. Usefulness of clinical tests for nerve damage in leprosy may vary depending on whether the purpose is for diagnosis, patient education or clinical follow-up.

DANIEL, Ebenezer, ARUNTHATHI, S. Climatic droplet keratopathy in leprosy. *Int. J. Leprosy*, v. 64, n. 1, p. 66-68, March, 1996.

An atypical gross form of climatic droplet keratopathy (CDK) occurring in the cornea of 24 eyes of 17 leprosy patients is described. The CDKs were situated in the lower outer quadrant of the cornea and were not associated with trauma, scars or vascularization. All patients, except one, belonged to the lepromatous group. Fifteen of the 24 eyes with this form of CDK had impaired corneal sensation. We suggest that this form of CDK is a distinctive condition found among lepromatous leprosy patients with possible infection and involvement of the corneal nerves.

DUCAN, M.E. Pregnancy and leprosy neuropathy. *Indian J. Leprosy*, v. 68, n. 1, p. 23-32, 1996.

Women with leprosy (even apparently cured) run a serious risk of deterioration in nerve function when they become pregnant. During pregnancy and lactation the woman with leprosy may suffer: relapse, reactivation and transient exacerbation maximally in late pregnancy; ENL in the first and third trimesters, continuing with nerve damage postpartum; RR maximally postpartum, even after MDT and RFT; neuritis affecting almost 50% of women in any pregnancy/lactation, in most cases as "silent" neuritis with new motor and sensory loss, even after MDT-RFT, and stocking-and-glove anaesthesia even in PB women and post MDT-RFT. Those incubating the infection develop overt disease frequently in reaction. This tragic cycle can only be stopped by a combination of: (i) leprologists and leprosy control personnel understanding the problems of leprosy in pregnant and lactating mothers; (ii) well-planned health education for leprosy patients, and both leprosy and maternal health care workers and (iii) the highest standard of clinical supervision during pregnancy, prolonged lactation and at regular intervals during the woman's reproductive life, even after she would normally be released from surveillance after completion of multiple drug

EDWARD, V.K., EDWARD, S., SHEGAONKAR, S. Dry skin lesions with marked hair loss in a case of BL leprosy. A case report. *Leprosy Rev.*, v. 67, n. 2, p. 141-144, June, 1996.

Skin lesions of leprosy that are anaesthetic, well defined, limited in number and dry with significant hair loss generally fit into the paucibacillary (PB) spectrum. The bacteriological index (BI) is expected to be negative or low. We have reported a case who presented with such findings but whose BI readings were high. Together with the biopsy findings the patient was classified as having borderline (BL) leprosy. The role of the skin smear examination and the misleading nature of some clinical features are highlighted. The authors feel that skin smear examinations should be performed on all leprosy patients at the time of diagnosis.

GATTI, Carlos Fernando, CHÁ, Diana, BARQUIN, Maria Antonio, BERBEN, Viviane. Lepra histioide de Wade. *Rev. Leprol. Fontilles*, v. 20, n. 3, p. 857, Septiembre-Diciembre, 1995.

Presentamos una paciente de 65 años oriunda del noreste argentino (Corrientes) quien presenta lesiones de aspecto nódulo tumoral en cara y cuello de 3 años de evolución. El diagnóstico de Lepra Histioides se confirmó baciloscópicamente e histopatológicamente.

JOB, C.K. Nerve in reversal reaction. *Indian J. Leprosy*, v. 68, n. 1, p. 43-46, 1996.

1. Much of the nerve destruction in leprosy takes place during the reactive phase, both during ENL reaction and RR.

2. The high risk patients expected to develop RR are borderline patients with generalized lesions (more than 10 skin lesions) and those presenting with three or more thickened nerve trunks.

3. In RR there is a sudden enhancement of already existing DTH to *M. leprae* and its antigens resulting in the release of excessive

quantities of TNF α , INF γ , and IL-2. The triggering mechanisms of this phenomenon is poorly understood.

4. The already existing granulomas suddenly increase considerably in size due to oedema and rapid influx of lymphocytes, Langhan's and foreign body giant cells. Fragments of *M. leprae* are also present in the granuloma of some patients.

5. In RR, the acute granulomatous inflammation can produce destruction of nerves even to the extent of causing caseous necrosis of the nerve tissue and irreversible paralysis, the swelling of the nerves due to sudden increase in inflammatory cells and oedema within an unyielding perineurium produce ischaemia and transient paralysis.

6. With prompt administration of anti-inflammatory drugs, paralysis recovers quickly, if it is of ischaemic origin; but will not recover if the Schwann cells and other nerve tissues are destroyed as a result of the immune granuloma.

7. A course of corticosteroids for six months along with anti-leprosy therapy is suggested in high risk patients as a preventive measure.

8. Further the serious problem of continuing nerve damage after clinical cure should be urgently tackled.

KATOCH, K. Autonomic nerve affection in leprosy. *Indian J. Leprosy*, v. 68, n. 1, p. 49-53, 1996.

Leprosy has been shown to affect almost all systems of human body and abnormalities in functions of autonomic nerves innervating various parts have been observed in several studies. In the skin and its appendages, the common changes are anhidrosis and varying degree of impaired sweat response. Signs of denervation of iris and reduced intraocular pressure are permanent features of autonomic involvement in the eye. In the cardiac autonomic functions, rhythm disturbances have been documented by several investigators. Respiratory function test studies have shown impaired breath holding time and decreased response to cough as well as other changes indicating blockade of vagus nerves and

sympathetic plexus. Abnormal testicular pain sensation and diminished nocturnal penile tumescence provide evidence of affliction of autonomic nerves of male genital system. Other important autonomic nervous system involvements include the nerves innervating the capillaries of legs. These changes have been observed to be more in extensive and long standing disease which indicate the need to study all these aspects in prospective studies specially in the light of early institution of multidrug treatment.

KETS, C.M., VAN LEERDAM, M.E., VAN BRAKEL, W.H., DEVILLE, W., BERTELSMANN, F.W. Reference values for touch sensibility thresholds in healthy Nepalese volunteers. *Leprosy Rev.*, v. 67, n. 1, p. 28, March, 1996.

A hundred and thirty-six apparently healthy volunteers between the ages of 16 and 67 were used to determine normative thresholds of tactile sensibility in the Nepali adult population.

Tactile sensibility thresholds on standardized sites on hands and feet were assessed for two sensory tests: Semmes - Weinstein monofilaments (SWM) and moving-point discrimination (M2PD). Results are reported as the proportion of subjects able to feel a given threshold. The effect of age, sex, side, occupation, smoking habit and alcohol consumption on the results was examined with quantile regression.

On the hand 200 mg seemed as appropriate threshold for 'normal' touch sensibility measured with monofilaments. About 99% (95% confidence interval 97-100) of individuals could detect this filament at all sites. A similar proportion could discriminate two points 4 mm apart which were moved from proximal to distal on the volar pad of the distal phalanx of the index and little finger. for the sole of the foot the thresholds were 2 g and 8 mm. Variability of results was greatest at the heel.

Normal thresholds for tactile sensibility were higher than those published for the North American population. Monofilament thresholds suitable for screening were 200 mg (log number 3.61) and 2 g (log number 4.31) for hand and foot,

respectively. For moving 2-point discrimination on the hand this threshold was 4 mm.

KUMAR, S.K., ASHOK, REDDY, B.S.N.

Correlation of skin and nerve histopathology in leprosy. *Leprosy Rev.*, v. 67, n. 2, p. 119-125, June, 1996.

Discrepancies have been noted in the histopathological findings between skin and nerve lesions of leprosy patients in some recent works. We studied concurrent skin and nerve biopsies in 27 randomly selected leprosy patients to correlate the histopathological features of skin and nerve lesions, and to assess the importance of neural histology in the classification of leprosy.

Skin and nerve biopsies were diagnostic of leprosy in 23 and 26 patients, respectively. A discrepancy was found between the two in 15 cases. Neural histology was helpful in the classification of determinate forms in 24 cases while dermal histology was significant only in 16 patients. A multibacillary nerve and paucibacillary skin picture was observed in 3 patients.

It was concluded that nerve biopsy is more informative and specific than skin biopsy in the diagnosis of leprosy and further helps to classify the patients when the skin histology is indeterminate or nonspecific.

MAHAJAN, P.M., JOGAIKAR, D.G., MEHTA,

J.M. A study of pure neuritic leprosy: clinical experience. *Indian J. Leprosy*, v. 68, n. 2, p. 137-141, April-June, 1996.

Pure neuritic leprosy is a well-recognized clinical entity. Manifestations of leprosy in pure neuritic form accounted for 179 patients out of the total 3853 leprosy patients (4.6%) attending our Poona Urban Leprosy Investigation Centre clinics. Patients with pure neuritic leprosy are prone to develop nerve damage. Eighty-seven (48.6%) of our pure neuritic patients presented with deformities. Involvement of upper extremity and right ulnar nerve in particular was the most common clinical feature. Patients presenting with involvement of two nerves of the same extremity

was also quite common. None of our patients developed skin lesions while on anti-leprosy treatment. It is important to recognize neuritic symptoms early and suspect leprosy even in the absence of skin lesions.

MISHRA, B., MUKHERJEE, A., GIRDHAR, A., HUSAIN, S., MALAVIYA, G.N., GIRDHAR, B.K. Neuritic leprosy: further progression and significance. *Acta Leprol.*, v. 9, n. 4, p. 187-194, 1995.

Sixteen neuritic cases have been seen developing cutaneous lesions. These cutaneous lesions by and large appear within 4 months after the diagnosis of neuritic leprosy. Leprosy pathology in cutaneous lesions has been found ranging between indeterminate and borderline lepromatous group. Development of cutaneous lesions does not seem to be influenced by age, sex or number of nerves or lepromin status. Neither lesions seem to appear in any particular part of the body. Therapy, duration and type i.e. monodrug or multidrug, also does not seem to influence the development of cutaneous lesions in either way. It appears that neuritic cases with either very early (indeterminate) or with advanced multibacillary neural pathology may develop skin lesions. Skin lesion possibly appear following reversal reaction in skin. Cases with newly developed skin lesions well respond to standard therapy. Development of cutaneous lesions by neuritic cases possibly indicates towards the natural history of the disease, conforming to the hypothesis that leprosy is basically neural in inception and that all other forms emerge from it.

PALERMO, Maria Heloisa R., VUGMAN, Ithamar, FLEURY, Raul N., ZUCOLOTO, Sergio. Reduction of epidermal cell proliferation in skin lesions in lepromatous leprosy is greater than in indeterminate and tuberculoid leprosy lesions. *Int. J. Leprosy*, v. 64, n. 1, p. 37-42, March, 1996.

We have compared epidermal cell proliferation in skin biopsies from areas with lesions

to contralateral areas without lesions in patients with indeterminate, tuberculoid and lepromatous leprosy. Cell proliferation was determined as the percentage of labeled cells in the basal and suprabasal epidermal layers, using autoradiographic preparations of skin biopsies taken 1 hr after a 3H-thy-midine intradermal injection. We have found a significant reduction in epidermal cell proliferation in areas with lesions in the three groups of patients. The greatest reduction occurred in lepromatous patients. In lesions of patients with indeterminate or tuberculoid leprosy, the reduction was the same, and in both groups it was smaller than in lepromatous patients. In the areas without lesions, the index of labeled cells was similar to that of "normal" skin of nonleprosy patients.

In the contralateral unaffected areas from leprosy patients and in "normal" skin from nonleprosy patients, as well as in affected areas from patients with indeterminate leprosy, epidermal cell labeling was greater in the suprabasal layer than in the basal layer. In lesions of lepromatous patients, cell labeling was greater in the basal layer than in the suprabasal layer.

Our findings suggest that the reduction of epidermal cell proliferation in leprosy patients is restricted to the cell-mediated immune response, more intense in lepromatous leprosy. It does not seem to be related to denervation, which is greater in tuberculoid leprosy.

PETRO, T.S. Bullous type of reaction mimicking pemphigus in lepromatous leprosy. *Indian J. Leprosy*, v. 68, n. 2, p. 179-181, April-June, 1996.

Bullous type of reaction in leprosy is ordinarily confined to Mexico and South America, but pustular and bullous reactions in leprosy have been reported in Indian patients also (Job & Gault 1960, Periasamy & Suryaprakasa Rao 1985, Acharya et al 1976). In this presentation I report a case with bullous lesions resembling pemphigus. These lesions contained clear fluid which changed colour and became dark brown within 48 hours.

PÖNNIGHAUS, J.M. Diagnosis and management of single lesions in leprosy. *Leprosy Rev.*, v. 67, n. 2, p. 89-94, June, 1996.

Most clinicians will probably agree that it is more difficult to ascertain the diagnosis leprosy if only one skin lesion is found (which looks like leprosy) than if the patient presents with several lesions. In other words, a high sensitivity (few false negative diagnoses) and a high specificity (few false positive diagnoses) are difficult to achieve in patients with only one skin lesion, and in particular, if the single lesion is on the face, where unimpaired sensation does not exclude a diagnosis of leprosy. If the single lesion is an enlarged nerve many clinicians will 'for all practical purposes' decide that the diagnosis must be leprosy and that antileprosy treatment should be commenced although, even in highly endemic areas, not all nerve enlargement is due to leprosy. In Ethiopia definite histopathological evidence of leprosy was found in only 42 out of 81 biopsies from (presumably enlarged) peripheral nerves. There have also been several reports about ischiatic nerve damage following injections of quinine, which can be confused with nerve damage due to primary neuritic leprosy.

TERENCIO DE LS AGUAS, J., CONTRERAS RUBIO, Félix. Carcinoma epidermoide sobre ulceración neurotrófica en enfermo de lepra. *Rev. LeproL Fontilles*, v. 20, n. 3, p. 865, Septiembre-Diciembre, 1995.

Se hacen consideraciones sobre la frecuencia de cáncer y lepra, exponiendo la experiencia personal en esta asociación patológica y la de cáncer sobre úlceras crónicas en enfermos de lepra.

A continuación se presenta una enferma de 78 años afecta de lepra lepromatosa con inactividad bacteriológica desde 1958 y con importantes secuelas neurológicas y óseas que desde hace 3 años presenta una extensa ulceración neutrófica en pie derecho, vegetante en los últimos meses, con diagnóstico de Hiperplasia Pseudoepiteliomatosa y Carcinoma Epidermoide.

VAN BRAKEL, W.H., KHAWAS, IB. Nerve function impairment in leprosy: an epidemiological and clinical study - Part 2: results of steroid treatment. *Leprosy Rev.*, v. 67, n. 2, p.104-118, June, 1996.

This retrospective cohort study aimed to determine the progress of sensory and motor function during and after steroid treatment, and to identify any prognostic factors for the outcome of treatment.

The study used one hundred and sixty-eight leprosy patients registered at Green Pastures Hospital, Pokhara, West Nepal, who were treated with one of four different corticosteroid regimens for impairment of nerve function.

The function of the main peripheral nerve trunks affected in leprosy was assessed with a nylon filament to test touch thresholds (TST) and a manual voluntary muscle test (VMT) to quantify muscle strength. The TST and VMT scores at 3 months after initiation of steroid treatment served as the main outcome measure. The significance of potential prognostic factor was evaluated with logistic regression.

At 3 months, the sensory and motor function of the majority of patients with 'recent' impairment (= less than 6 months duration) had improved significantly ($p < 0.01$, Wilcoxon matched pairs signed-ranks test). The likelihood of 'good' recovery (prognosis) for both sensibility and motor function was directly related to the severity of the nerve damage at the beginning of treatment.

Although nerve function improved in 30-84% (depending on the type of nerve) of patients, an active search for better methods of treatment and improved regimens is justified. The need for early assessment and treatment is stressed.

EPIDEMIOLOGIA E CONTROLE

GANAPATI, R., REVANKAR, C.R., KINGSLEY, S. Management of leprosy on the basis of the epidemiology of disabilities. *Leprosy Rev.*, v. 67, n. 1, p. 13, March, 1996.

With the reduction on caseload due to the impact of multidrug therapy (MDT) in most parts of India, we believe that there is a need to understand the epidemiology of disabilities in leprosy which may not necessarily correlate with the distribution pattern of active disease. We present a methodology of data collection and verification taking the district as a unit to calculate the prevalence rate of disability as an exclusive entity in the district population, unrelated to the problems posed by the communicable component of leprosy. This study indicated that the prevalence rate of Grade II disabilities in 14 hyperendemic districts was 0.82/1000, whereas it was 0.22/1000 in low endemic districts. Limb disability data collected from three hyperendemic districts in Andhra Pradesh following task-oriented training enabled the paramedical worker to offer services to 5753 disabled patients after assessing the disability caseload per worker.

JEDUDASAN, K., VILAYAKUMARAN, P., MOZHI, N. Mani, RAO, P.S.S.Sundar. A leprosy survey in a taluk headquarters town and the role of dermatological services and active health education in its success - A preliminary report. *Indian J. Leprosy*, v. 68, n. 2, p. 175-178, April-June, 1996.

A report of two general surveys done in 1984 and 1987 in Gudiyatham town, is presented. The first survey covered 89.2% and the second survey 82% of the population. The new case detection rate was 3.4 per 1000. The success of the survey was due to the co-operation obtained from the public, most probably because of the intense and sustained health education, combined with leprosy services integrated with a dermatology clinic.

MYINT, Tin, HTOON, Myo Thet. Leprosy in Myanmar, epidemiological and operation changes, 1958-92. *Leprosy Rev.*, v.67, n. 1, p. 18, March, 1996.

The registered caseload and prevalence of leprosy have declined in Myanmar from a peak

of 86.2 per 10,000 population (95% CI 85.43086.97) in 1973-77 to 26.82 (95% CI 18.4635.18) in 1988-92. The new case detection rates have also declined from 7.41 per 10,000 (95% CI 6.308.52) in 1968-72 to 1.96 (95% CI 1.43-2.52) in 1988-92. The increase in the multibacillary proportion of new cases from 11.85% (95% CI 11.84-11.86) in 1968-72 to 40.54% (95% CI 37.243.88) in 1988-92 and the decline in proportion of new cases under 14 years of age from 26.81% (95% CI 26.8-26.82) in 1968-72 to 11.22% (95% CI 10.92-11.52), coupled with the finding of declining detection rates among school children and in mass village surveys could mean that the incidence of leprosy may be declining.

NAIK, S.S., MORE, P.R. The pattern of 'drop-out' of smear-positive cases at an urban leprosy centre. *Indian J. Leprosy*, v. 68, n. 2, p. 1610166, April-June, 1996.

One hundred nineteen smear-positive leprosy cases registered at an urban leprosy centre in Bombay in 1991 were followed for three years to study the 'drop-out' pattern in them and judge the utility of some corrective measures for the same. The measures included having maps showing exact location of the patient's residence, paying home visits on registration days and subsequent persuasion and counselling both at the clinic and at the residence of patients. The results were compared with 'drop-outs' in smear-positive cases registered at the same centre in 1989, 1990, 1992 and 1993. By introduction of the special measures, the 'drop-out' rate was significantly reduced from 52% (for other years) to 36% (1991). The expenses incurred for the successful recovery of 'drop-out prone' patients and ensuring regularity in drug intake was Rs. 659/- per patient. This study of 'drop-out' patient shows that there are three categories of the so-called drop-outs: (i) the false 'drop-outs' (51%): these patients get transfer as per their convenience to other leprosy centres or medical services (private practitioners or consultants) within the city (ii)

drop-outs due to migration: the migration is forced on them due to some genuine reason, and (iii) persistent offenders: this is a group of adamant, non-cooperative, or, distressed patients, for the first two categories of patients it is advisable to introduce a good referral system. For the recalcitrant defaulters, supervised short-term drug therapy will probably be the best option.

PINITSSONTORN, Somdej, SCHREUDER, Pieter A.M., CHIRAWATKUL, Aroon, SRISAENPANG, Sompong, PIYASILPA, Piya, SAO WAKONTA, Sastri. Rapid village survey to determine the size of the leprosy pattern problem in Khon Kaen Province, Thailand. *Int J. Leprosy*, v. 64, n. 1, p. 51-57, March, 1996.

The rapid village survey (RVS) method has been developed as a simpler, less-expensive alternative to random sample surveys for determining the prevalence of leprosy and was compared with a total population survey (TVS). In the RVS, the cluster population receives clear information about the disease, and those with symptoms are invited to be examined by the survey team. A list of household contacts and suspects was made and those on the list were actively traced. The registered population was 20,815; 10 new patients were found among the 2034 people self-reporting in the RVS, 0 among the household contacts and suspects, and an additional 2 new patients in the TVS. There were 12 registered patients among the sample population. The prevalence rate found by the RVS was 1.06 per 1000 (95% CI = 0.49-1.63) and in the TVS 1.16 per 1000 (95% CI = 0.5-1.77). The man-days and costs of an RVS are considerably less than those for a TVS. It was concluded that the RVS is a valid replacement for the TVS as conducted in Khon Kaen Province, Thailand. The RVS can be applied under low-endemic conditions and could be carried out by the general health staff.

IMUNO-PATOLOGIA

ILANGUMARAN, Subburaj, RAMANATHAN, Sheela, SHANKERNARAYAN, Nallakandypanangan, RAMU, Gopal, MUTHUKKARAUPPAN, Veerappan.

Immunological profiles of leprosy patients and healthy family contacts toward *M. leprae* antigens. *Int. J. Leprosy*, v. 64, n. 1, p. 6-13, March, 1996.

In this study, we measured simultaneously the *in vitro* and *in vivo* T lymphocyte reactivities and the antibody response of leprosy patients and healthy family contacts (HFO) toward *Mycobacterium leprae* antigens. The *in vitro* lymphoproliferative response of the HFC to leprosin A was comparable to that of tuberculoid leprosy patients. However, their skin-test reactivity to Dharmendra lepromin was considerably higher compared to the *in vitro* response to leprosin A. A significant number of HFC failed to respond to *M. leprae* antigens, both *in vitro* and *in vivo*, and the unresponsiveness to either test was not related to the type of leprosy patients in the household. A marginal correlation was observed between the skin-test reactivity of HFC and the age of the individuals. Even though a significant proportion of HFC showed positive anti-PGL-I IgM levels, none showed a positive titer in the serum antibody competition test toward the *M. leprae*-specific epitope My2. A positive anti-PGL-I IgM response together with a negative lepromin skin-test reactivity showed a clear downward trend from the lepromatous pole toward the tuberculoid pole. A small number of HFC, all contacts of lepromatous patients, were lepromin skin-test negative with positive anti-PGL-I IgM levels, but the majority among them showed T-cell reactivity to mycobacterial antigens *in vitro*. These results are discussed in relation to immunological correlates of the susceptibility to *M. leprae* infection.

KIFAYET, Arnawaz, HUSSAIN, Rabia. IgG subclass recognition pattern in leprosy: recognition of *M. leprae* antigens by IgG1 and IgG3 antibodies is distinct across the disease spectrum. *Int. J. Leprosy*, v. 64, n. 1, p. 69-77, March, 1996.

The recognition of *Mycobacterium leprae* antigens by IgG subclasses in patients with leprosy was investigated by electrophoresing *M. leprae* sonicate in SDS-polyacrylamide gel and immunoblotting analysis. Serum pools were used from leprosy patients with either lepromatous (LL/LB) or tuberculoid (BT/TT) disease. A serum pool from healthy controls (EC) was used to determine the baseline antibody activity. To adjust for quantitative differences in antibodies across the disease spectrum, the LL/LB serum pool was used at a 1:200 dilution; the BT/TT serum pool, at 1:20 dilution. Monoclonal antibodies specific for each of the IgG subclasses were used as probes, with anti-mouse IgG conjugated to alkaline phosphatase as the revealing probe. IgG1 antibodies bound to several discrete bands in the range of 10-70 kDa in LL/LB patients, while BT/TT patients showed a more diffuse pattern with the strongest IgG1 antibody binding in the region of 25-40 kDa. Recognition with IgG2 was restricted to a region between 25-36 kDa (which also stained strongly for carbohydrates) in both LL/LB and BT/TT patients. Binding with IgG3 antibodies was more restricted than IgG1 antibodies in LL/LB sera with strong recognition restricted to 25 and 28 kDa. BT/TT sera showed strong binding with IgG3 antibodies in the region of 25-32 as well as 5-7 kDa. IgG4 antibodies showed weak binding to a 28-kDa in lepromatous patients only. The differences in IgG subclass recognition patterns and their implications are discussed.

KIFAYET, Arnawaz, HUSSAIN, Rabia. Selective decrease of *M. leprae*-specific IgG1 and IgG3 antibodies in leprosy patients associated with ENL. *Int. J. Leprosy*, v. 64, n. 2, p. 105-114, June, 1996.

Erythema nodosum leprosum (ENL) is a serious complication of lepromatous leprosy.

Because of the similarities with the Arthus-type reaction, ENL is presumed to be due to immune complex formation and their deposition in the tissues. The aim of this study was to dissect the antibody response at the IgG subclass level to ascertain differences in IgG subclass in nonreactional lepromatous/borderline lepromatous (LL/BL) patients and reactional (ENL) lepromatous patients. The ENL group showed significantly lower serum antibody levels for the four subclasses compared to the LL/BL group of patients using the Mann-Whitney U test (IgG1, $p = 0.0001$; IgG2, $p = 0.0009$; IgG3, $p = 0.0001$; IgG4, $p = 0.03$). Since the majority of ENL patients (54 of 67) had received leprosy chemotherapy for varying durations of time, LL/BL patients were also compared with 19 ENL patients who had received <2 weeks of chemotherapy. In this group only IgG1 ($p = 0.048$) and IgG2 ($p = 0.001$) antibodies showed significantly lower concentrations. Immunoblotting analysis demonstrated that in ENL patients IgG1 showed a selective disappearance of several antigenic bands recognized by the LL/BL serum pool; while most of the antigens recognized by IgG3 antibodies in the LL/BL serum pool were not detected in the ENL serum pool or in the sera of pretreated individual ENL patients. These results suggest that IgG1 and IgG3 may be the most pathogenic IgG subclass antibodies during ENL, and their deposition in tissues could initiate the complement-mediated inflammatory pathway resulting in the clinical disease associated with ENL.

MEMON, Riaz A., HUSSAIN, Rabia, RAYNES, John G., LATEFF, Anisa, CHIANG, Thamas J. Alterations in serum lipids in lepromatous leprosy patients with and without ENL reactions and their relationship to acute phase proteins. *Int. J. Leprosy*, v. 64, n. 2, p. 115-122, June, 1996.

The concentrations of serum lipids were measured in patients with lepromatous (LL/BL) leprosy and erythema nodosum leprosum (ENL). The relationships between serum lipid levels and serum amyloid A (SAA) and C-reactive protein (CRP) were also examined in these patients. LL/

BL patients had significantly higher serum triglyceride and lower HDL-cholesterol concentrations compared to the endemic controls. ENL patients had significantly lower total, HDL- and LDL-cholesterol levels compared to the endemic controls. The levels of all lipid metabolites also were significantly lower in ENL patients compared to LL/BL patients. The concentrations of SAA and CRP were markedly elevated in ENL patients but were not statistically different in LL/BL patients compared to control subjects. There was a significant negative correlation between SAA and HDL-cholesterol levels in both stable lepromatous and reactional (ENL) patients; there was no statistically significant correlation between CRP and HDL-cholesterol levels. SAA levels also had a significant negative correlation with total and LDL-cholesterol levels. Our results indicate that serum lipids are significantly altered in patients with lepromatous disease and ENL reaction. Our results also suggest that an increase in SAA levels may divert the metabolism of lipoproteins from hepatocytes toward macrophages, resulting in a decrease in serum lipoprotein levels.

NATRAJAN, M., KATOCH, K., KATOCH, V.M., BHARADWAJ, V.P. Enhancement in the histological diagnosis of indeterminate leprosy by demonstration of mycobacterial antigens. *Acta Leprol.*, v. 9, n. 4, p. 201-207, 1995.

In a clinico-pathological study of Indeterminate leprosy, fifty-six cases were chosen based on specified clinical criteria. Their clinical features were noted, the smears for acid fast bacilli (AFB) were prepared from lesions, lepromin inoculation and biopsies were performed from the lesional edges. They were subsequently treated with a modified extended WHO regimen for paucibacillary leprosy. On routine hematoxylin eosin (HE) and Fite-Faraco staining of paraffin embedded sections, histopathological confirmation of Indeterminate leprosy was observed in only 17/56 (31%) of the clinically diagnosed cases whereas the remaining were labelled as non-specific pathology. Histometric analysis of all HE stained sections did not show any characteristic

finding which could be considered as characteristic and discriminatory for Indetermined leprosy. Immunoperoxidase staining for demonstration of mycobacterial antigen by direct staining procedure using conjugated rabbit anti-BCG and indirect three step procedure using primary rabbit anti-BCG and avidin biotin complex, was next performed on the sections exhibiting non-specific pathology. With the direct immunoperoxidase method, antigen was demonstrable in (11/35) 31% of the cases. The more sensitive indirect method could demonstrate the presence of antigen in (21/35) 60% of the cases.

This study thus shows that demonstration of mycobacterial antigen by simple and unexpensive immunoperoxidase techniques enhances the histopathologic diagnosis of Indetermined leprosy.

PARKASH, O., KUMAR, V., MUKHERJEE, A., SEN GUPTA, U., MĀLAVIYA, G.N., GIRDHAR, B.K. Membrane attack complex in thickened cutaneous sensory nerves of leprosy patients. *Acta Leprol*, v. 9, n. 4, p. 195-199, 1995.

Membrane attack complex (MAC) is a terminal end product produced as a result of complement activation. The deposition of MAC, in tissues, is known to have a local tissue damaging effect in several clinical conditions. Therefore, an attempt was made to demonstrate MAC in peripheral nerve biopsies, collected from leprosy patient. Interestingly, we could demonstrate deposition of MAC in involved cutaneous sensory nerves from most of the lepromatous leprosy patients. Contrary to this, majority of nerve biopsies from tuberculoid leprosy patients did not stain for MAC. Though MAC positive sections showed reactivity for S-protein, our observations support the possibility that MAC, either acting directly or indirectly, may be implicated in nerve damage, at least, in lepromatous leprosy patients.

RAMU, G., KARTIKEYAN, S., BALAKRISHNAN, S., PATAIL, S.A., RAMANTHAN, V.D., DESIKAN, K.V. Histological and immunological correlates of suspected leprosy lesions. *Indian J. Leprosy*, v. 68, n. 2, p. 155-159, April-June, 1996.

Thirty-two subjects with suspected leprosy lesions were investigated to assess various modalities of sensibility and sweat function and these were correlated with immunological and histological parameters. It was found that pain and temperature, mediated by small unmyelinated fibres were impaired in the early lesions. Impairment of sweat function was seen only when one of the modalities of sensibility was also affected. Antibodies specific to a protein (35 kDa) antigen and phenolic glycolipid 1 of *Mycobacterium leprae* were positive in nine and 12 cases respectively, while 15 of the 31 biopsies revealed the presence of mycobacterial antigens in these lesions. The implications of these findings are discussed.

SHIVANNAVAR, Channappa T., KATOCH, Vichwa, SHARMA, Vishnu, PATIL, Madhusudan A. KATOCH, Kiran, BHARADWAJ, Ved P., AGRAWAL, Bhakt M. Development of a SOD ELISA to determine to immunological realltedness among mycobacteria. *Int. J. Leprosy*, v. 64, n. 1, p. 58-54, March, 1996.

This study reports on the standardization of an enzyme-linked immunosorbent assay (ELISA) system for the measurement of immunological distances (ImDs) of the superoxide dismutase (SOD) molecule among the cultivable mycobacteria, namely, *Mycobacterium vaccae*, *M. phlei*, *M. tuberculosis* H37Ra, *M. tuberculosis* H37Rv, and *M. bovis* BCG, and *M. leprae*. SODs from cultivable mycobacteria were purified, antibodies were raised against these molecules, and ImDs between these anti-SOD antibodies and antigen (SODS) were determined by an immunoprecipitation technique standardized earlier and by the ELISA technique developed in this study. The ELISA system developed in this

study showed higher sensitivity and consistent and reproducible Imds among various mycobacteria, including pathogens such as *M. tuberculosis*, *M. leprae* and *M. avium*. These values were comparable with the values derived by the immunoprecipitation technique. Our ELISA technique appears to be a sensitive and rapidly reproducible method with the additional advantage of the stability of reagents, and holds promise in the taxonomy as well as in the development of diagnostics for leprosy and other mycobacterial infections.

TURK, J.L. Host parasite response in nerve in leprosy. *Indian J. Leprosy*, v.68, n. 1, p.113-116, 1996.

Nerve granulomas occur at all points across the leprosy spectrum. Studies have been made using experimental models in which mycobacteria were injected directly in the sciatic or posterior tibial nerve of the guinea pig. Clinical and electrophysiological studies demonstrated axonal damage which was confirmed by morphometric studies showing disrupted myelin sheaths and in places complete demyelination. Further immunohistological studies showed a complete disappearance of staining for certain neuropeptides. The role of Schwann cells has also been investigated. Schwann cells in nerves affected by mycobacterial granulomas, both experimental and in leprosy patients were not demonstrated to be MHC class II positive suggesting that they did not play a role in antigen presentation. Macrophages in leprosy granulomas were shown to contain TNF α , suggesting that this cytokine played a role in axonal damage. The role of mycobacterial heat-shock protein in nerve granulomas has not as yet been determined.

The localized nature of granulomas in leprosy nerves and nerves with experimental mycobacterial granulomas has been studied by a process of excision and repair with muscle grafts. Marked recovery has been demonstrated by clinical, electrophysiological, morphometric and immuno-histochemical techniques, the latter demonstrating a return of neuropeptide production.

VALLISHAYEE, R.S., GUPTE, M.D., ANANTHARAMAN, D.S., NAGARAJU, B. Post-vaccination with ICRC vaccine. *Indian J. Leprosy*, v. 68, n. 2, p. 167-174, April-June, 1996.

ICRC vaccine is one of the candidate anti-leprosy vaccines under test in a large scale comparative vaccine in trial. The objectives of the present study was to study the sensitization potential, as measured by Rees' MLSA and lepromin, and reactogenicity of this vaccine preparation in the local population. The study included 368 'healthy' individuals aged 1-70 years. Each individual received either ICRC vaccine or normal saline (control) by random allocation. They were also tested with Rees' MLSA and leprominA, 12 weeks after vaccination. Reactions to Rees' MLSA were measured after 48 hours and those to lepromin-A after 48 hours and three weeks. Character and size of local response, at the vaccination site, were recorded at 3rd, 8th and 15th week after vaccination. The results of the study showed that healing of vaccination lesion was uneventful, the mean size of the lesion being 10.3 mm. The mean sizes of post-vaccination reactions, to Rees' MLSA and lepromin (both early and late reactions), were significantly higher in the vaccine group compared to that in the normal saline group; the sensitizing effect attributable to the vaccine was of the order of 3.5 mm, 1.7 mm and 2.2 mm respectively. In conclusion, the study has demonstrated that ICRC vaccine was 'safe' and produced significant sensitizing effect as measured by post-vaccination sensitization to Rees' MLSA and lepromin, in the local population.

VEMURI, N. VIEIRA, L.M., TANEJA, S.V., GANGAL, S.V., MUKHERJEE, R. Antisphingolipid antibodies in the sera of leprosy patients. *Leprosy Rev.*, v. 67, n. 2, p. 95-103, June, 1996.

Earlier we reported the presence of significant levels of antigalactocerebroside (GalC) antibodies in the sera of leprosy patients. This study corroborate the above result and also gives

evidence for the presence of antibodies to the nonpolar ceramine (Cer) moiety of GalC. AntiCer antibody titres were higher as compared to antiGalC antibodies in all categories of leprosy. The specificity of antibodies directed to the Cer moiety was confirmed using Lactosyl-BSA and neutralization assays. Statistically significant and positive correlations were observed between antiGalC and antiCer antibodies. Responsiveness factor were computed using natural logarithmic transformation of the variables.

HANSENÍASE EXPERIMENTAL

GUERRA-INFANTE, Fernando, QUESADA-PASCUAL, Fausto, ESTRADA-PARRA, Sergio, SANTOS-ARGUMEDO, Leopoldo. Evolution of lymphocyte populations in armadillos (*Dasypus novemcinctus*) inoculated with *M. leprae*. *Int. J. Leprosy*, v. 64, n. 2, p. 152-158, 1996.

In human leprosy patients there are changes in the percentages of T and B lymphocytes in peripheral blood, and there is a correlation with the clinical characteristics or manifestations of the disease. These phenomena still require clarification regarding the triggering mechanism involved that may lead to one or the other clinical entities. Much has yet to be learned about the intricacies the changes in subpopulations of T and B lymphocytes are a causative factor or an effect attributable to the microorganism itself.

The armadillo is an excellent animal model to study how *Mycobacterium lepraespread*, turning into an established infection. The application of modifications in percentages of the subpopulations of B and T lymphocytes in armadillos may well lead to extrapolation of the results obtained in this animal model in an attempt to be able to manipulate the course of the disease in humans.

The purpose of the study was to evaluate changes in the percentages of rosette-forming and sIgM + mononuclear cells during a full year in groups of armadillos: five randomly chosen animals formed the control group and 11 armadillos were

inoculated with *M. leprae* obtained from a human leproma at the onset of the 12-month period of the study. Of the 11 randomly selected armadillos that were inoculated, only five developed an active and disseminated infection. The percentage of rosette-forming cells did not show statistically significant variations during the first 6 months of the study. However, at months 8 and 12 a significant increment in this parameter was observed ($p < 0.005$) in the animals with active infection. In regard to the variations in the numbers of sIgM + cells, significant changes occurred in the armadillos with active infection at month 2. However, results returned to normal and no changes were seen at later times, no significant changes occurred in the group of animals inoculated but not developing active infection compared with the other groups. The results are considered sufficiently interesting to encourage further study on the cell-mediated immune system of the armadillo and the changes that occur during the development and dissemination of an inoculated infection with *M. leprae*. Since this mammal is of great value as an effective animal model in the experimental research of *M. leprae*, there is an urgent need to obtain, as quickly as possible, a thorough understanding of the cellular branch of its immune system and, thereby, be in a position to extrapolate immune modulation to benefit human leprosy patients.

SCOLLARD, David M., LATHROP, George W., TRUMAN, Richard W. Infection of distal peripheral nerves by *M. leprae* in infected armadillos; and experimental model of nerve involvement in leprosy. *Int. J. Leprosy*, v. 64, n. 2, p. 146-151, June, 1996.

Mechanisms of localization of *Mycobacterium leprae* to the peripheral nerves and of subsequent nerve injury are not understood. No experimental animal model has been available for use in examining the pathogenesis of *M. leprae* - induced nerve injury. A detailed dissection was, therefore, done of the major peripheral nerves in the extremities of six *M. leprae* - inoculated armadillos, three of which had developed characteristic disseminated infection.

All of the animals with disseminated infection had extensive involvement of the peripheral nerves, increasing in intensity as the nerve was followed distally. No *M. leprae* were found in the animals without disseminated infection. The degree of infection was greater in epineural tissues than in the intraneural compartment (i.e., Schwann cells) at all levels. The infection of nerves by *M. leprae* was associated with focal interstitial, mononuclear cell infiltration of involved nerves.

These results suggest that: 1) armadillos offer a model for the study of neural involvement in leprosy, since the pattern of neural distribution in susceptible armadillos is comparable to the pattern of nerve involvement in man; 2) early localization of *M. leprae* may be to the epineural tissues, including lymphatic and vascular structures and extracellular matrix; 3) Schwann cell involvement may be a late event; and 4) mechanisms involving the endothelium of epineural and perineural tissues may be important in the selective localization of *M. leprae* to peripheral nerves.

ZHOU, Hui-Min, SHI, Ahen-Rong, MUKHERJEE, Ashok, WALSH, Gerald P., FRANKEL, Sarah, MEYERS, Wayne M. Ultrastructure of normal armadillo epidermis. *Int. J. Leprosy*, v. 64, n. 2, p. 159-165, June, 1996.

In view of the importance of the ninebanded armadillo (*Dasypus novemcinctus*) in leprosy research, we studied the ultrastructure of the normal epidermis of this species. The three basic cell types of human epidermis were identified in armadillo skin: keratinocytes, melanocytes, and Langerhans' cells. The role of Langerhans' cells in the human cell-mediated immune system and the description of changes in the number and structure of Langerhans' cells in human leprosy make detailed observations of these cells in the armadillo highly relevant. Clear cells with ultrastructural features typical of Langerhans' cells were observed in normal armadillo epidermis in all areas of skin sample (abdomen, chin, ear, and thigh), but are fewer than in human skin. These baseline findings are valuable for further studies

on Langerhans' cells and the cell-mediated immune function in armadillos with naturally acquired or experimental leprosy.

MICROBIOLOGIA

CHEMOULLI, Philippe, WOODS, Sally, SAID, Gerard, COLE, Stewart T. Detection of *Mycobacterium leprae* in nerve lesions by the polymerase chain reaction. *Int. J. Leprosy*, v. 64, n. 1, p. 3-5, March, 1996.

A simple procedure is described for the detection of *Mycobacterium leprae* by the polymerase chain reaction in nerve biopsies sectioned with a cryostat and then treated with proteinase K. All samples from lepromatous leprosy patients and the majority of samples from paucibacillary cases yielded positive results. This approach may be useful for differentiating between leprosy and other inflammatory neuropathies.

JOB, Charles K., JAYAKUMAR, Joseph, ASCHHOFF, Maria, MATHAN, Minnie M. Viability of *Mycobacterium leprae* in skin and peripheral nerves and persistence of nerve destruction in multibacillary patients after 2 years of multidrug therapy. *Int. J. Leprosy*, v. 64, n. 1, p. 44-50, March, 1996.

The pathological changes, bacterial load, and viability of *Mycobacterium leprae* in the skin and nerves of nine lepromatous leprosy patients who had undergone 2 years of multidrug therapy (MDT) were studied. *M. leprae* and varying amounts of their remnants were present in the nerves and skin of all but one patient. *M. leprae* isolated from skin biopsies of six patients and nerve biopsies of nine patients were inoculated into mouse foot pads. No growth was obtained from any one of them. During the electron-microscopic examination of three nerve biopsies, only one specimen showed a small number of solid-staining *M. leprae*. These findings would explain the low relapse rate in patients treated with 2 years of fix-duration MDT. Results of a long-

term follow up of patients is awaited with interest. The possibility of nerve paralysis due to intraneural microreaction and fibrosis consequent to the continued presence of dead bacterial remnants should be seriously considered.

SHETHY, V.P., ANTIA, N.H. A semi quantitative analysis of bacterial load in different cell types in leprosy nerve using transmission electron microscope. *Indian J. Leprosy*, v. 68, n. 1, p. 105-107, 1996.

Thirty lepromatous (BL-LL) and 25 tuberculoid (TT-BT) nerve lesions obtained from untreated cases of leprosy were scanned using transmission electron microscope for assessing the bacterial load in different cell types.

Major bulk of infection was seen in the Schwann cells of nonmyelinated fibres, in both early lepromatous and tuberculoid nerve lesions, suggesting that *M. leprae* spread mainly via the Schwann cells within the nerve.

REABILITAÇÃO

BEINE, A. Abductor pollicis longus deviation graft operation: a new procedure on the thumb in ulnar cum low median palsy for correction of subluxation of carpometacarpal (CMC) joint. *Indian J. Leprosy*, v. 68, n. 2, p. 143-148, April-June, 1996.

For correction of instability of the carpometacarpal joint (CMC joint) of the thumb in combined paralysis of ulnar and median nerves in leprosy bone fusing procedures have been used, but they are not desirable and can often be avoided. A procedure analogous to the "Extensor pollicis brevis deviation graft operation" for the correction of instability of the metacarpophalangeal joint of the thumb is described here. The new procedure appears to be useful to correct and stabilize the subluxated carpometacarpal joint of the thumb actively during the use of the hand. When thumb web contracture has occurred and the passive range of movement needed for

successful opponens replacement of thumb is not available, this new procedure helps to prepare such a severe deformed thumb for correction at earlier time.

EBENEZER, M., PARTHEEBARAJAN, S., SOLOMON, S. Long-term follow-up of joint stabilization procedures in the treatment of fixed deformities of feet in leprosy. *Leprosy Rev.*, v. 67, n. 2, p. 126-134, June, 1996.

This retrospective study of 52 patients, who underwent joint stabilization procedures for static deformities of the feet in leprosy between 1971 and 1985, was undertaken to assess the long-term results of joint stabilization of feet for fixed deformities in leprosy. The main purpose of joint stabilization is to make the feet plantigrade for weight bearing and to make the wearing of footwear possible. Deformities corrected include varus, equinus and equino-varus. Chronic ulceration occurs repeatedly if these deformities are not corrected and leads to inevitable bone destruction and eventual amputation.

HIRZEL, C., GRAUWIN, M.Y., MANE, I., CARTEL, J. L. Resultats obtenus par une equipe mobile de prevention des invalidités à l'Institut de Léprologie de Dakar. *Acta Leprol*, v. 8, n. 4, p. 183-186, 1995.

De 584 malades connus à l'Institut de Léprologie Appliquée de Dakar pour atteinte neurologique avec ou sans mal perforant plantaire (MPP), 242 (41%) ont pu être suivis pendant un temps moyen de 8,2 ans (extrêmes 5 et 10 ans) par l'équipe mobile de prévention des invalidités (éducation sanitaire, soins et cordonnerie). Tous les deux mois une visite du malade à son lieu de résidence a été organisée. Elle comportait un entretien qui avait pour but de vérifier si le malade pratiquait bien les gestes appris en séance d'éducation sanitaire pour surveillance des mains et des pieds. Au cours de l'entretien, des conseils et des encouragements étaient prodigués. Des chaussures adaptées étaient fournies moyennant une petite somme forfaitaire, l'empreinte ou le

moulage ayant été effectué au cours de la visite précédente. Les infirmiers du poste de santé (formés par l'équipe mobile) assuraient sur place les petits soins et parages. Parmi les 242 malades suivis:

- des 107 sans MPP au départ, 90 (84%) n'en présentaient pas lors du dernier contrôle,
- des 135 avec MPP au départ, 57 (42%) étaient guéris lors du dernier contrôle,
- des 135 avec MPP au départ, 74 autres (55%) sont restés stationnaires (sans aggravation),
- les 21 derniers, dont 17 présentaient un pied déformé sans MPP au départ, ont vu leur état s'aggraver (tous avaient un MPP lors du dernier contrôle).

Au total, l'état de 221 (91%) des 242 malades est resté stable ou s'est amélioré. Un suivi régulier des malades est donc essentiel pour assurer la guérison ou empêcher l'apparition, l'aggravation ou la récurrence des MP P. Ce suivi doit comporter l'éducation sanitaire, les soins et le port de chaussures adaptées.

SHARMA, P., KAR., H.K., BEENA, K.R., KAUR, H., NARAYAN, Raj. Disabilities in multibacillary leprosy patients: before, during and after multidrug therapy. *Indian J. Leprosy*, v. 68, n. 2, p. 127-136, April-June, 1996.

One hundred fifty-one patients (125 males and 26 females) of multibacillary leprosy (LL 88, BL 40, BB 23), registered during 1986-1992 for multidrug therapy (MDT), were analysed with reference to their disabilities before, during and after MDT. At induction 48 (31.7%) had disability (Gr 0), 59 (39.0%) had only peripheral anaesthesia (Gr 1) and 44 (29.1%) had Gr 2 and 3 deformities with or without anaesthesia. The parallel analysis of the three groups, with nearly equal duration of symptoms, revealed that new deformities developed in only a few cases during and after MDT, least in the Gr 0 group. The crude fresh deformity incidence was 59.2 per 1,000 person years of observation. The rate of recovery from anaesthesia was higher (64%) in Gr 1 group than that (44%) in group with Gr 2, 3 deformities. No significant difference was observed between the incidence of Gr2 deformities developed before,

during and after MDT (incidence of claw-hands 9.2% before and 7.9% during and after MDT, trophic ulcers 13.9% before and 17.8% during and after MDT). Out of 19 cases which developed motor weakness during MDT and follow-up, 10 (52.6%) were instances of quite nerve paralysis. Occupational factors influenced the development of deformities but not the sex and bacterial load. Generally, the lower the Grade of disability at induction of patient for MDT, the lower the chances of new disability development and higher the chances of recovery from sensory impairments.

TIENDREBEGO, Alexandre, TOURE, Idrissou, ZERBO, Petit-Jean. A survey of leprosy impairments and disabilities among patients treated by MDT in Burkina Faso. *Int. J. Leprosy*, v. 64, n. 1, p. 15-25, March, 1996.

Since 1990, Burkina Faso, a West African country, has carried out a national leprosy control program treating with WHO/MDT nearly 12,000 patients between 1990 and 1994. A sample survey of 600 cases among these patients showed that 29.8% were disabled cases. There was a predominance of males, older patients, the multibacillary form of leprosy, and former cases treated with dapson before MDT. The actual rate increased 8.5% compared to the frequency of disabilities at detection (21.3%). The need for disability care was estimated, respectively, at 24.4% and 5% for primary and secondary grades of disability. These important needs were so great that the authors recommend the planning and initiation of a physical rehabilitation and disability prevention program in this country.

VULUET, F. Vicissitudes du traitement des handicaps hanséniens à Kopolowé (Zaire). *Acta Leprol*, v. 9, n. 4, p. 179-182, 1995.

En 1990, Kopolowé abritait sans doute l'unique centre chirurgical du Zaïre s'intéressant aux séquelles handicapantes de la lèpre. Il paraît utile d'exposer les aléas d'une telle entreprise pour des raisons qui tiennent, non pas à médecine, mais à un contexte socio-politique particulièrement

difficile. Les meilleurs éléments chirurgicaux ont été expulsés pour motifs politiques; l'insécurité et les difficultés économiques ont pratiquement stoppé les déplacements, et donc le rayonnement. Au cours d'une mission en 1994, la remise en route a pu être effectuée au moins partiellement. L'équipe chirurgicale est réinstallée et opérationnelle.

On a pu constater que le traitement médical par polychimiothérapie (PCT) a toujours été assuré, que les infirmes lépreux, vivant en groupe, traités avant 1990, et faisant l'objet d'une surveillance régulière, n'ont pas subi de rechutes graves, ce qui justifie les indications posées antérieurement, notamment en matière de décompression chirurgicale.

Si la plupart d'entre eux ont pu reprendre une partie de leur activité professionnelle, on ne peut s'en désintéresser socialement et la notion d'invalidité permanente partielle doit être appliquée.

TERAPÉUTICA

AHMED, K.M., EL TAHIR, M.S. The role of village leaders in the implementation of multidrug therapy for leprosy, Sudan - a pilot study in the Angasana Hills. *Leprosy Rev.*, v. 67, n. 1, p. 39, March, 1996.

The purpose of this study is to implement multidrug therapy (MDT) and to evaluate the possible role of village leaders in supervising MDT treatment in remote and inaccessible areas in Sudan where health facilities are poor.

Three villages from the Angasana Hills in the south-east of Sudan, where leprosy is endemic, have been chosen for this study.

A health education course for village leaders in the area was conducted. Three medical assistants from a nearby village were identified to examine all leprosy suspects and to put the diagnosed cases on treatment. The village leaders were to supervise the treatment of the patients during the rainy season.

Out of 43 cases detected all paucibacillary (PB) cases detected (11 cases) completed their

treatment and 28 out of 32 multibacillary (MB) cases were regularly on treatment. It has been obvious that the village leaders were useful in supervising MDT in the Angasana area, process which can be extended to other inaccessible areas in the Sudan.

BRASIL, MitieTada Lopes Rabello da Fonseca, OPROMOLLA, Diltor V.A., MARZILIAK, Mary Lise C., NOGUEIRA, Wagner. Results of a surveillance system for adverse effects in leprosy's WHO/MDT. *Int. J. Leprosy*, v. 64, n. 2, p. 97-104, June, 1996.

The implementation of the World Health Organization's multidrug therapy (WHO/MDT) in Brazil began slowly and gradually in 1986, and in 1991 it was adopted officially by the Brazilian Ministry for Health. After 1991, during the intensive cases phase of WHO/MDT implementation, there was some concern about the number of cases of renal failure observed in several Brazilian states, including some fatalities. This was the motive behind the state of São Paulo's Health Department's decision to carry out a study that would evaluate not only the incidence rate of adverse effects of rifampin in relation to kidney function but also in relation to the use of WHO/MDT in general. Due to the existence in the state of São Paulo of health services with a program for the control of Hansen's disease and an organized and stratified system of epidemiological surveillance, it was possible to elaborate a subsystem for data collecting. During the period from July 1991 to December 1993, 20,667 patients were treated with WHO/MDT. Among this group there were 127 notifications considered as adverse effects, mainly: "flu" - like syndrome (54), acute renal failure (20), cutaneous reactions (15), toxic hepatitis (15), gastrointestinal complaints (8), hemolytic anemia (6), methemoglobinemia (4), thrombocytopenic purpura (2), hypotension (2) and disseminated intravascular coagulation (1). There was a predominance of adverse effects among multibacillary (MB) patients and the majority of the reactions occurred before the 6th dose; 82.7% of MB patients had had previous treatment with dapsone and rifampin and, due the fact that most severe reactions were related to rifampin, a

booster mechanism could be an explanation for this occurrence. So far, there are seven published reports on renal failure in the world, and in Brazil only in the state of São Paulo there were 20 cases reported among 20, 667 patients under WHO/ MDT treatment. This striking difference deserves a better explanation, but in no way do these reports undermine the positive aspects of WHO/ MDT. However, the authors believe that a world alert about its possible serious side effects is not only necessary but ethically required.

BUTLIN, Cynthia Ruth, NEUPANE, Kapil D., FAILBUS, Sarah S., MORGAN, Allyson, BRITTON, Warwick J. Drug. resistance in Nepali leprosy patients. *Int. J. Leprosy*, v. 64, n. 2, p. 136-141, June, 1996.

Although multidrug therapy (MDT) was introduced into Nepal in 1983, the MDT coverage only recently exceeded 67%. In view of the large number of patients who were still receiving dapsone monotherapy, it is relevant to investigate the current levels of dapsone and rifampin resistance. The study was undertaken at a leprosy referral hospital near Kathmandu. Over a 51/2 - year period, 157 leprosy patients with a bacterial index (BI) > 2.0 were investigated for drug resistance according to the method of Rees. Among previously untreated cases, 6% of 88 isolates showed low-dose dapsone resistance; among previously treated patients with a presumed relapse, 47% of 34 isolates demonstrated dapsone resistance. In the remaining 35 cases there was no growth in control mice. Rifampin resistance was not confirmed in any case.

CROFT, R.P. Active surveillance in leprosy: how useful is it? *Leprosy Rev.*, v. 67, n. 2, p. 135-140, June, 1996.

In this paper, active surveillance is compared with self-reporting as a method of detecting new nerve function loss in leprosy patients who have completed multidrug therapy (MDT). Five hundred and three patients were selected according to new surveillance guidelines

in one part of the Danish - Bangladesh Leprosy Mission leprosy control project working area. Surveillance coverage of 71% was achieved in a 7-month period. During this time, 10 released-from-treatment (RFT) patients from among the study group were found to have acute nerve damage requiring prednisolone treatment. Out of the 10, only 2 were detected actively; the remaining 8 self-reported.

It is concluded that health education given at RFT time is effective in motivating patients to self-report with acute nerve damage, and that the time spent on active surveillance could have been better used in other activities, i.e., case detection.

As a result of these findings, active surveillance has been abandoned in the leprosy control project.

JESUDASAN, Kumar, VIJAYAKUMARAN, Palanisamy, MANIMOZHI, Natarajan, JEYARAJAN, Thirthuvaraj, RAO, Pamidipani Samuel Simon. Absence of relapse within 4 years among 34 multibacillary patients with high bls treated for 2 years with MDT. *Int J. Leprosy*, v. 64, n. 2, p. 133-135, June, 1996.

Thirty-four multibacillary patients with a bacterial index (BI) of 3+ or more were treated with 2 years of WHO multidrug therapy (WHO/MDT). Treatment was then stopped and the patients followed for a minimum of 4 years. The rate of fall in the BI in this group without further treatment was similar to the rate of fall in the BI in an earlier group of similar patients treated with MDT until skin-smear negativity. No relapses have been seen.

JESUDASAN, Kumar, VIJAYAKUMARAN, Palanisamy, MANIMOZHI, Natarajan, RAO, Pamidipani Samuel Simon, SAMUEIL, Peter. Effectiveness of MDT in multibacillary leprosy. *Int. J. Leprosy*, v. 64, n. 2, p. 128-132, June, 1996.

The study on the use of World Health

Organization multidrug therapy (WHO/MDT) under field conditions was initiated in December 1981, and included 1067 multibacillary (MB) patients treated with two MDT regimens. The first was a THELEP - recommended regimen which consisted of 600 mg of rifampin (RFP) and 600 mg of clofazimine (CLO) given under supervision on two consecutive days monthly and 225 mg of diacetyl diaminodiphenylsulfone (DADDS) bimonthly plus dapsone (DDS) 100 mg daily unsepervised. The second regimen was the conventional MDT: patients received RFP 600 mg and CLO 300 mg supervised once a month, daily 100 mg of DDS and 50 mg of CLO unsupervised.

A zero relapse rate was obtained after more than 10 years (a total of 8244 person-years) of follow up. Both regimens were well tolerated with few complications and a high acceptability, even among women. The fall in the bacterial index (BI) was 0.5-1.0+ in positive patients. CLO discoloration began to decrease after 3 months and disappeared within 1 year after it was discontinued. Seventy-two patients (67%) developed reactions during the treatment period; a further 12 patients developed post-treatment reactions during the surveillance period. This study vindicates MDT treatment for MB patients as recommended by WHO under field conditions.

MAJUMDER, Vibek, MUKERJEE, Ashutosh, HAJRA, S.K., SAHA, B., SAHA, Kunal. Immunotherapy of far-advanced lepromatous leprosy patients with low-dose Convit vaccine along with multidrug therapy (Calcutta Trial). *int. J. Leprosy*, v. 64, n. 1, p. 26-36, March, 1996.

This report describes a promising mode of treatment of lepromin-unresponsive, faradvanced, lepromatous (LL) leprosy patients with antileprosy vaccines as an adjunct to multidrug therapy (MDT). The Trial Groups included 50 highly bacilliferous, lepromin-negative, untreated LL patients. They were given MDT for 2 years. Of them, 30 patients were administered a mixed antileprosy vaccine containing killed

Mycobacterium leprae of human origin plus *M. bovis* BCG. The remaining 20 patients were given *M. bovis* BCG. Depending on the severity of lepromin unresponsiveness, they were given one to six inoculations at 3-month intervals. Another 20 similar LL patients were taken in the Control Group. They were given only MDT for 2 years. From the start of the study, all patients belonging to the Trial and Control Groups were followed every 3 months for clinical, bacteriological and immunological outcomes. Within 2 years all 50 patients of the Trial Groups and 19 of the 20 patients of the Control Group became clinically inactive and bacteriologically negative. However, the clinical cure and the falls of the bacterial and morphological indexes were much faster in those patients receiving the mixed vaccine therapy than in those patients who were given BCG plus MDT or only MDT. The immunological improvements in the patients of the Trial and Control Groups were assessed by: a) lepromin testing at the beginning of the study and at 3-month intervals and also by b) the in vitro leukocyte migration inhibition (LMI) test at both the beginning and end of the study. As the patients were given more and more vaccinations, the incidence of lepromin conversion increased, more so in the patients receiving the mixed vaccine. Thus, 63%, 15% and 5% of the patients became lepromin positive in those patients receiving the mixed vaccine, BCG, and MDT only, respectively. Lamentably, the vaccine-induced lepromin positivity was temporary and faded away within several months. At the beginning of the study, the LMI test against specific *M. leprae* antigen was negative in all patients of both the Trial and Control Groups. After the end of the chemo-immunotherapy schedule, the LMI test became positive in 50% and 20% of LL patients receiving the mixed vaccine and BCG, respectively. None of the Control Group could show LMI positivity after completion of the MDT schedule. These results show that treatment of LL patients with the mixed vaccine and MDT could quickly reverse the clinical course of the disease remove immunologic anergy in some patients, and induce a rapid decrease in the bacterial load in them.

MAMIDI, N.V.S. Rao, PRABHAKAR, M.C., KRISHNA, D.R. Disposition of rifampicin following intranasal and oral administration. *Indian J. Leprosy*, v. 68, n. 2, p. 149-153, April-June, 1996.

Leprosy is transmitted by dissemination of *M. leprae* which are lodged in the nose of the patients suffering from multibacillary (MB) type of the disease. Rifampicin, a potent bactericidal antileprotic drug is given orally to the patients with a view to make the infective cases non-infective. Earlier work by us has shown that intranasal administration of rifampicin helps in reducing the *M. leprae* load in the nose much faster than after conventional oral administration. In the present study, rifampicin concentrations in plasma/urine/ nasal wash of healthy volunteers following oral and intranasal administration were determined. Following intranasal administration, rifampicin was not detectable in plasma and high concentrations were measured in the nasal wash. Following oral administration, rifampicin was not detectable in the nasal wash indicating that enough antibiotic levels are not available for clearing *M. leprae* from nose.

TRAORE, Issa, BAOHONG, J1, LIENHARDT, Christian, BOBIN, Pierre, GROSEET, Jacques. Determination of the minimal effective dosages of ofloxacin and sparfloxacin against *M. leprae* in the mouse foot pad system. *Int J. Leprosy*, v. 64, n. 2, p. 142-145, June, 1996.

The minimal effective dosages (MEDs) of ofloxacin (OFLO) and sparfloxacin (SPFX) against 10 isolates of *Mycobacterium leprae* were measured in the mouse foot pad system. The

drugs were administered either by gavage or by incorporation into the mouse diet in a range of concentrations. The results demonstrated that the MEDs of OFLO were 4 to 5 times higher than those of SPFX, thus confirming that, on a weight-to-weight basis, the anti-*M. leprae* activity of SPFX was significantly greater than that of OFLO. The MEDs of OFLO/SPFX measured by gavage were 20 times lower than those measured by incorporating the drug into the mouse diet.

VIJAYAKUMARAN, Palanisamy, JESUDASAN, Kumar, MANIMOZHI, Natarajan. Fixed duration therapy (FDT) in multibacillary leprosy; Efficacy and complications. *Int. J. Leprosy*, v. 62, n. 2, p. 123-127, June, 1996.

The World Health Organization (WHO) recommended a multidrug therapy (MDT) regimen for multibacillary (MB) leprosy patients in 1982 which was to be administered for a minimum period of 2 years or until a skin smear was negative for acid-fast bacilli, whichever was later. This regimen contains rifampin, dapsone and clofazimine. A single dose of rifampin was shown to effect a high degree of bacterial killing (99.9%). The combined therapy administered for 2 years may be adequate to bring about "total" bacterial killing and to prevent the emergence of drug resistance and persists. In this study, 360 smear-positive and previously untreated MB leprosy patients were treated with WHO/MDT for 2 years; 22.8% of these MB patients developed lepra reaction during therapy and 10.7% during surveillance. The bacterial index continued to decline even after termination of fixed-duration therapy. None of these patients relapsed during 886 person-years of surveillance.