

Abstracts

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nerves, and occasionally affecting circumflex, musculocutaneous and/or femoral nerves. On electromyography with needle electrodes spontaneous activity resembling denervation diphasic and positive potentials was picked up from the affected muscles; some muscles also gave spontaneous activity resembling motor unit signals. The conduction velocities were not reduced markedly, and in most of the cases showed recovery within a period of few weeks thus suggesting that the process of segmental demyelination was less likely to be the factor. Sensory potential amplitudes were reduced without the compatible remarkable slowing of sensory conduction velocity. Eleven nerves in eight patients showed complete loss of conduction on initial studies; however, on repeat studies which were possible only in seven nerves, four showed rapid recovery. There seems to be sufficient evidence of involvement of peripheral part of the axons in some of the nerves of patients with severe tetanus although the reasons determining the choice of the nerves are not clear. Other causes of neuropathy like serum neuritis, hypersensitivity reaction to tetanus toxoid, drugs and traction etc. have been ruled out.

91 Motor Unit Involvement in Chronic Chagas' Disease.

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An electrophysiological and histological study of the skeletal muscle in patients with chronic Chagas' disease has been made. 90 patients below the age of 60 were investigated, on clinical and laboratory grounds, the only abnormality found being, the presence of positive serum tests for Chagas' disease. Conventional emg showed a diminished interference pattern in 78% of the patients, mainly in distal muscles of the lower limbs; most of the observed volitional potentials were fragmented or polyphasic and a great deal of them showed also increased amplitude; neither fibrillations nor positive sharp waves were seen. Nerve motor and sensory conduction velocities as well as motor terminal latencies were in the control range. No decremental muscle response was found to supramaximal nerve repetitive stimulation. 54% of the patients had a reduced number of motor units (m.u.) within the thenar muscles, 15% in the hypothenar, 37% in the soleus and 21% in the e.d.b.; those patients who showed losses of m.u. always had a significant increased size of the remaining m.u. ($P < .001$). Samples of gastrocnemius were obtained from 7 patients; on muscle histological examination 6 out of them showed angular fibres and type I and type II muscle fibre grouping. The findings suggest that in the studied population there is a good proportion of patients who showed involvement of the m.u., probably due to a lesion of the alpha motoneurone soma, which is well compensated by sprouting of the surviving axons belonging to healthy motoneurons which, eventually, take over the muscle fibres relinquished by their original innervation.

92 The Use of Nerve Biopsy in Hansen's Disease

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In Hansen's disease, nerve biopsy may give information of use in patient assessment, and also help in resolving some of the uncertainties regarding the pathogenesis of the disease. Microdissection methods are especially useful in determining the number and distribution of bacteria in the nerve, and the amount of nerve damage. A modified Wade-Fite procedure was used to show bacterial distribution in individual nerve fibres, and minute areas of myelin damage were detected by their abnormal acid phosphatase content. The findings indicate that nerve biopsy can be of use in determining disease activity, and the type of host resistance. In some cases, large numbers of bacteria were found in nerve when skin biopsies and smears were negative. Bacteria were rare in nerve from patients with high resistance, but small areas of myelin damage were always seen when the disease was active. The pattern of involvement was in keeping with widespread haematogenous dissemination of infection, with damage to the nerve both by bacteria, and by host reaction to infection. There was no evidence of axonal transport of bacteria.

93 Long Treated Lepromatous Leprosy: Histochemistry and Electronmicroscopy of Muscle

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Seven patients with proven lepromatous leprosy on regular treatment for over two years, with no overt muscle weakness, were selected. The first dorsal interosseous muscle appeared normal at operation, except in one, and was biopsied for histological, histochemical and electronmicroscopic examination. Fresh frozen sections, stained for ATPase, Phosphorylase and SDH showed a preponderance of Type I fibres with the average ratio of Type I : Type II :: 1.0 : 0.6. Type grouping was observed in two cases. Examination of paraffin sections showed variation of fibre size in 2 cases and group atrophy in another 2. One specimen showed myositis and degeneration. Semi-thin araldite sections revealed stray degenerating fibres and proliferation of basement membrane of blood vessels in 4 specimens. Fine structural examination showed normal fibres along with atrophic ones and, frequently, degenerating fibres. Degeneration was manifested by loss or disorganisation of myofibrils and myofilaments and, sometimes, accumulation of mitochondria or lipofuscin. Only doubtful degenerating bacilli were seen. Blood vessels showed thickening and proliferation of endothelial cells, pericytes and their basement membrane. Two specimens of normal muscles from very early tuberculoid cases serving as controls, showed normal features on histological, histochemical and fine structural examination.

94 Motor Nerve Conduction Velocity in Leprosy and its Correlation with Clinical and Histological Findings.

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There is scanty information regarding correlation between clinical, electrophysiological and histopathological findings in leprosy neuritis. The present study of motor conduction velocity (M.C.V.) in various peripheral nerves in such patients was undertaken to demonstrate their correlation with clinical and histopathological features. 43 cases of lepromatous, dimorphic and tuberculoid varieties of leprosy were taken randomly. Following detailed clinical examination M.C.V. studies were performed on median, ulnar, lateral popliteal and posterior tibial nerves. Biopsied sural nerves were examined in 40 patients. 20 age matched healthy people of either sex served as controls for comparison of motor nerve conduction with the patients. Majority of patients were between 21-40 years. The results showed that MCV was diminished in all types of leprosy as compared with controls and was more markedly diminished in lepromatous and dimorphous leprosy. MCV was lower in the superficial segments of the nerves. There was a direct relationship between the clinical thickening of the peripheral nerves and the diminished MCV. A direct relationship also exists between the degree of thickened nerves clinically and the abnormal histopathological changes in the biopsied sural nerves. This has shown an indirect evidence that the degree of conduction abnormality is directly related to the severity of the histopathological changes in the sural nerves.

→ 95 Effect of an Aldose Reductase Inhibitor on Diabetic Peripheral Neuropathy.

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The effect of the short-term administration of an inhibitor of the enzyme aldose reductase (Alrestatin) was determined in 10 patients with diabetes mellitus, distal sensory-motor neuropathy and retinopathy. Aldose reductase converts free glucose to sorbitol, a sugar alcohol incriminated in the development of diabetic complications.

Alrestatin was infused intravenously at a rate of 50 mg/kg/24 hours at 6 hour intervals over a period of 5 days.

On post-treatment day 1, the average motor conduction velocities of peroneal, ulnar, and median nerves were not significantly different from pre-treatment values, whereas the average antidromic sensory latency of median nerves had decreased to 3.4 milliseconds from a pre-treatment value of 4.6 milliseconds. Individually, the degree of change post-treatment paralleled the severity of involvement pre-treatment.

Post-treatment retinal fluorescein angiograms showed a decrease in circulation time in retinal and choroidal vessels. Daily blood glucose profiles demonstrated a significant (50%) blood glucose lowering effect during treatment days in 2 patients regulated on diet alone.

Autonomic nerve dysfunctions improved in 3 patients and general well-being was reported by 6 patients during the treatment period. Adverse reactions were not observed.

Long-term, double-blind, cross-over studies with Alrestatin are warranted in view of our preliminary findings.

96 Sural Nerve Refractory Period in Diabetic Neuropathies.

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Examination of peripheral nerve refractory period gives information about impairment of impulse transmission in myelinated nerve fibres. This can be used as a diagnostic tool for early diagnosis of neuropathy, for instance in diabetics.

Application of double stimuli to sural nerves of diabetics and comparison with findings in healthy control persons of equal age showed early changes in the sural nerve refractory period, preceding or paralleling alterations of the conduction velocity. Findings in distal sensory type of diabetic neuropathy are compared with results in patients with predominant motor involvement. Conclusions concern the pathogenetic mechanism in diabetic neuropathy.

97 Clinical and Instrumental Evaluation of Peripheral and Autonomic Neuropathy in Insulin Dependent Juvenile Diabetics.

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Although both peripheral nerves and autonomic nervous system are frequently impaired in diabetes, a definite epidemiological assessment of this disturbance is still lacking.

Our investigation deals with a group of 60 patients suffering from insulin dependent diabetes, in an age-range between 15 and 35 years.

The patients were studied from a clinical point of view and tested with electrophysiological techniques (electromyography of two muscles, sensory conduction velocity of median and sural nerves, motor conduction velocity of deep peroneal nerve, mixed conduction velocity of median nerve). Tests to assess the involvement of the autonomic nervous system (hand-grip test, Valsalva manoeuvre orthostatic hypotension) were also applied.

One or more of the quoted tests gave very often pathological values even in cases where anamnesis and clinical examination were normal. More than 50 per cent of the patients examined had evidence of peripheral and autonomic neuropathy already one year after the discovery of diabetes.

The high incidence of peripheral and autonomic neuropathy and the strict correlation between these conditions, indicate that they are caused by a definite metabolic alteration rather than by less specific vascular complications (diabetic microangiopathy).