

CLINICAL-BEHAVIORAL LONG-TERM PROFILE OF PAINFUL EXPERIMENTAL DIABETIC NEUROPATHY (ABSTRACT)*. DISSERTATION. FORTALEZA, 1997.

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Diabetes mellitus is a chronic disease of energy metabolism and chronic complications are one of its major characteristics. Neuropathy is the most prevalent chronic complication of diabetes mellitus. Its pathophysiology still remains as a challenge to be solved. The diabetic neuropathy shows several clinical pictures. In one of these, the diabetic neuropathy manifests itself as a chronic neuropathic pain of difficult control, provoking a great anguish in its bearers. Among the several types of painful diabetic neuropathies, the sensorimotor symmetric polyneuropathy outstands for its greatest frequency.

Animal models that faithfully represent this painful clinical condition are lacking, and this is one of the reasons why we know very little about the pathophysiology and treatment of the painful diabetic neuropathy. The literature about experimental pain in diabetic rats is conflicting, and in its majority concerns only painful evoked behaviors. Moreover, the majority of these studies was accomplished in short periods of disease.

With the purpose of studying not yet reported spontaneous behavioral changes in diabetic rats, we induced diabetes in 32 rats with an intraperitoneal injection of streptozotocin in a dose of 75 mg/Kg. The animals were then followed during 27 weeks. In this study, we looked for changes similar to human diabetes, and for sensorimotor neuropathy evidences, through the utilization of clinical observations, sciatic functional index parameters, and thermal tests with non-noxious (40°C) and noxious (46°C) stimulus, respectively. Nevertheless, the aim of our study was to characterize the spontaneous behavioral changes that could suggest signs of chronic pain, particularly the scratching behavior, that has been proclaimed as a parameter of nociceptive chronic pain in arthritic rats, and of neuropathic pain in rats with compressive sciatic mononeuropathy.

With the aim of testing these possible results, we have tried to revert such behavioral changes utilizing a potent analgesic (morphine), and to antagonize the analgesic effects over the behaviors with a specific antagonist (naloxone).

Our results evidenced a clinical syndrome similar to human diabetes (with polyuria, cataract, and weight loss), motor neuropathy of distal predominance, sensory neuropathy (hypoalgesia in some animals, and hyperalgesia in others). The behavioral analysis revealed an increase of scratching and resting behaviors, and a decrease of motor, eating, and grooming behaviors. The pharmacological tests with morphine showed an inhibition of scratching behavior with reciprocal increase in the motor and eating activities, and decrease of resting behavior. Naloxone antagonized the effects induced by morphine.

The results allowed us to conclude that the diabetic animals showed, during 27 weeks, general clinical changes and neurological changes similar to the changes found in diabetic patients, such as polyuria, cataract, disautonomy, weight loss, and painful sensorimotor neuropathy. This confirms the similarity of the model with the clinical condition found in human diabetes mellitus. Moreover, the diabetic rats showed behavioral signs of chronic pain, evidenced by decrease in sniffing, rearing, eating, and grooming behaviors, and an increase of scratching and resting behaviors. Morphine decreased the time spent in scratching behavior by the diabetic animals and this was antagonized by naloxone, thereby confirming that this behavior, possibly, is also manifestation of pain in this model of painful diabetic neuropathy in rats.

KEY WORDS: chronic pain, painful neuropathy, diabetic neuropathy, experimental neuropathy, scratching behavior, morphine/naloxone, hyper/hypoalgesia.

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GROUP PHYSIOTHERAPY FOR HEMIPLEGIC OR HEMIPARETIC PATIENTS WITH MIDDLE CEREBRAL ARTERY ISCHEMIC STROKE (ABSTRACT)*. THESIS. SÃO PAULO, 1996.

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In some parts of the world, stroke is considered the main cause of chronic handicaps caused by neurologic disease. And it gives rise to an economic impact unfavourably high. Thus we found that studies on physical rehabilitation programs must be done, since they are considered the best set of therapeutics for motor disabilities resulting from stroke.

These programs should be more effective, less expensive and also allow the inclusion of this kind of treatment for stroke patients in low economic power services of great demand. In some studies we found that the physical therapy in group of patients might be a method consistent of the needs mentioned above.