

Pain. 1992 Sep;50(3):355-63.

An experimental model for peripheral neuropathy produced by segmental spinal nerve ligation in the rat.

Kim SH, Chung JM.

Source

Marine Biomedical Institute, University of Texas Medical Branch, Galveston 77555.

Abstract

We attempted to develop an experimental animal model for peripheral neuropathic pain. Under sodium pentobarbital anesthesia, both the L5 and L6 spinal nerves (group 1) or the L5 spinal nerve alone (group 2) of one side of the rat were tightly ligated. For comparison, a parallel study was conducted with another group of rats (group 3) which received a partial tight sciatic nerve ligation, a paradigm developed previously as a neuropathy model. Withdrawal latencies to application of radiant heat to the foot were tested for the next 16 weeks in all 3 groups. Sensitivity of the hind paw to mechanical stimulation was tested with von Frey filaments. The general behavior of each rat was noted during the entire test period. Results suggested that the surgical procedure in all 3 groups produced a long-lasting hyperalgesia to noxious heat (at least 5 weeks) and mechanical allodynia (at least 10 weeks) of the affected foot. In addition, there were behavioral signs of the presence of spontaneous pain in the affected foot. Therefore, we believe we have developed an experimental animal model for peripheral neuropathy using tight ligations of spinal nerves. The model manifests the symptoms of human patients with causalgia and is compatible with a previously developed neuropathy model. The present model has two unique features. First, the surgical procedure is stereotyped. Second, the levels of injured and intact spinal segments are completely separated, allowing independent experimental manipulations of the injured and intact spinal segments in future experiments to answer questions regarding mechanisms underlying causalgia.

PMID:

1333581

[PubMed - indexed for MEDLINE]