

Parameters of thick and thin nerve-fiber functions as predictors of pain in carpal tunnel syndrome.

Neundorfer B, Handwerker HO; Neurologische Klinik, Lang E, Claus D, Friedrich-Alexander-Universitat Erlangen-Nurnberg, Germany. Pain intensity in carpal tunnel syndrome (CTS) was correlated with neuro- and psychophysiological parameters related to the function of different nerve fiber classes within the median nerve in 23 patients. Control data were obtained from 16 normal subjects. Mean intensity of all pain attacks which occurred 14 days before surgical treatment was assessed on visual analogue scales (average CTS pain). Functions of thick myelinated nerve fibers were determined by motor and sensory nerve conduction studies. Functions of thin myelinated and unmyelinated nerve fibers were evaluated by measuring thresholds of warmth, cold and heat pain on the index and little finger. Pain intensity and neurogenic vasodilatation following noxious mechano-stimulation on the interdigital web between index and middle finger provided additional information on the functioning of nociceptive nerve fibers. Sympathetic reflexes induced by these painful stimuli were assessed by means of infrared thermography and photoplethysmography. Mean intensity of pain attacks (40 +/- 19% VAS) correlated significantly with latency ($r = 0.58, P < 0.01$) and amplitude ($r = -0.50, P < 0.01$) of the compound action potential from abductor pollicis brevis muscle following distal median nerve stimulation. Thresholds of warmth, cold and heat pain on index finger were significantly increased during CTS when compared to the control subjects. The magnitude of neurogenic vasodilatation and sympathetic vasoconstrictor reflexes were not significantly different. Average CTS pain correlated inversely to the threshold of heat pain on index ($r = -0.46, P < 0.05$), but also on the little finger ($r = -0.41, P < 0.05$), which is not innervated by the median nerve.