Scand J Pain. 2017 Dec 29;3(3):116-123. doi: 10.1016/j.sjpain.2012.01.002.

Differential pain modulation in patients with peripheral neuropathic pain and fibromyalgia.

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Abstract

Background The definition of neuropathic pain has recently been changed by the International Association for the Study of Pain. This means that conditions such as fibromyalgia cannot, as sometimes discussed, be included in the neuropathic pain conditions. However, fibromyalgiaand peripheral neuropathic pain share common clinical features such as spontaneous pain and hypersensitivity to external stimuli. Therefore, it is of interest to directly compare the conditions. Material and methods In this study we directly compared the pain modulation in neuropathic pain versus fibromyalgia by recording responses to a cold pressor test in 30 patients with peripheral neuropathic pain, 28 patients with fibromyalgia, and 26 pain-free age-and gender-matched healthy controls. Patients were asked to rate their spontaneous pain on a visual analog scale (VAS (0-100 mm) immediately before and immediately after the cold pressor test. Furthermore the duration (s) of extremity immersion in cold water was used as a measure of the pain tolerance threshold, and the perceived pain intensity at pain tolerance on the VAS was recorded on the extremity in the water after the cold pressor test. In addition, thermal (thermo tester) and mechanical stimuli (pressure algometer) were used to determine sensory detection, pain detection, and pain tolerance thresholds in different body parts. All sensory tests were done by the same examiner, in the same room, and with each subject in a supine position. The sequence of examinations was the following: (1) reaction time, (2) pressure thresholds, (3) thermal thresholds, and (4) cold pressor test. Reaction time was measured to ensure that psychomotoric inhibitions did not influence pain thresholds. Results Pain modulation induced by a cold pressor test reduced spontaneous pain by 40% on average in neuropathic pain patients, but increased spontaneous pain by 2.6% in fibromyalgia patients. This difference between fibromyalgia and neuropathic pain patients was significant ($P < 0.002$). Fibromyalgia patients withdrew their extremity from the cold water significantly earlier than neuropathic pain patients and healthy controls; however, they had a higher perceived pain intensity on the VAS than neuropathic pain patients and control subjects. Furthermore, neuropathic pain patients had a localized hypersensitivity to mechanical and thermal stimuli in the affected area of the body. In contrast, fibromyalgia patients displayed a general hypersensitivity to mechanical and thermal stimuli when the stimuli were rated by the VAS, and hypersensitivity to some of the sensory stimuli. Conclusions These findings are the first to suggest that a conditioning stimulus evoked by a cold pressor test reduced spontaneous ongoing pain in patients with peripheral neuropathic pain, but not in fibromyalgia patients when directly compared.

The current study supports the notion that fibromyalgia and neuropathic pain are distinct pain conditions with separate sensory patterns and dysfunctions in pain-modulating networks. Fibromyalgia should therefore not, as sometimes discussed, be included in NP conditions. Implications On the basis of the findings, it is of interest to speculate on the underlying mechanisms. The results are consistent with the idea that peripheral neuropathic pain is primarily driven from damaged nerve endings in the periphery, while chronic fibromyalgia pain may be a central disorder with increased activity in pain-facilitating systems.

KEYWORDS:

Cold pressor test; Fibromyalgia; Neuropathic pain; Pain thresholds

PMID:29913862

DOI:10.1016/j.sjpain.2012.01.002