Comment on Wang et al.: Thiamine, pyridoxine, cyanocobalamin and their combination inhibit thermal, but not mechanical hyperalgesia in rats with primary sensory neuron injury (Pain 2005;114:266–77)

To the Editor,

I read with interest the study by Dr Wang and his colleagues, describing their novel work on the analgesic effect of B vitamins in nerve-injured rats (Wang et al., 2005). I believe that their work adds significantly to the growing body of evidence showing that dietary constituents could play a role in pain modulation in experimental animals. One of the major findings of this research is the selective analgesic effect of B vitamins on thermal, but not mechanical hyperalgesia. In their discussion the authors comment that no studies focusing on this issue have yet been published. Since this topic bears substantial scientific and clinical importance I would like to correct this statement. Previous studies have been done, described this phenomenon in other models of partial nerve injury, and some also focused on the possible mechanisms of mechanical and thermal hyperalgesia differentiation. For example, it has been shown that NMDA receptor are mainly involved in mechanisms of thermal hyperalgesia while coactivation of AMPA and glutamate receptors could be the culprit of mechanical hyperalgesia (Meller et al., 1993). In support of these findings, other researchers have shown that NMDA antagonists suppressed thermal but not mechanical hyperalgesia (Tal and Bennett, 1994). It is possible that the differential response to mechanical and thermal stimuli relates to the degree of nerve injury. While the percentage of injured fibers following partial nerve injury was less critical for the development of thermal hyperalgesia, tactile allodynia developed only in rats with moderate, but not high percentage of injured nerve fibers (Obata et al., 2003).

The differential effect of analgesic medications on thermal and mechanical hyperalgesia has been investigated as well. Christensen and Kayser examined the effect of chronic morphine exposure on mechanical and thermal pain in nerve-injured rats. They found that the mechanical afferent system may be more sensitive to hyperalgesia associated with chronic morphine treatment than the thermal system (Christensen and Kayser, 2000). It has also been shown that a variety of analgesic drugs, commonly used for neuropathic pain, had differing analgesic profiles after nerve injury in rats. For example, gabapentin alleviated mechanical allodynia but not mechanical hyperalgesia or cold allodynia (Erichsen and Blackburn-Munro, 2002).

We have conducted a series of experiments testing the effect of various dietary ingredients on neuropathic pain in rats undergoing partial nerve injury. For example, in experiments testing the analgesic effect of soy phytoestrogens we have shown that midrange plasma levels of phytoestrogens were associated with reduced mechanical, but not thermal pain (Shir et al., 2002). We have also shown that dietary protein manipulation suppressed thermal, but not mechanical hyperalgesia, while dietary fat modification significantly suppressed both pain behaviors (Perez et al., 2004). Lastly, we recently found that certain dietary oils are capable of suppressing thermal, but not tactile hyperalgesia after partial nerve injury (Perez et al., 2005).

I agree with Dr Wang and his colleagues that further studies are needed to address this issue. Focusing on the ability of dietary constituents to modify specific pain behaviors could open the way for novel pain therapies in humans.

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