Thiamine, pyridoxine, cyanocobalamin and their combination inhibit thermal, but not mechanical hyperalgesia in rats with primary sensory neuron injury.

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BACKGROUND: Neuropathic pain after nerve injury is severe and intractable, and current drugs and nondrug therapies offer substantial pain relief to no more than half of affected patients.

OBJECTIVE: The present study investigated the analgesic roles of the B vitamins thiamine (B1), pyridoxine (B6) and cyanocobalamin (B12) in rats with neuropathic pain caused by spinal ganglia compression (CCD) or loose ligation of the sciatic nerve (CCI).

METHODS: Thermal hyperalgesia was determined by a significantly shortened latency of foot withdrawal to radiant heat, and mechanical hyperalgesia was determined by a significantly decreased threshold of foot withdrawal to von Frey filaments stimulation of the plantar surface of hindpaw.

RESULTS: Results showed that (1) intraperitoneal injection of B1 (5, 10, 33 and 100 mg/kg), B6 (33 and 100 mg/kg) or B12 (0.5 and 2 mg/kg) significantly reduced thermal hyperalgesia; (2) the combination of B1, B6 and B12 synergistically inhibited thermal hyperalgesia; (3) repetitive administration of vitamin B complex (containing B1/B6/B12 33/33/0.5 mg/kg, for 1 and 2 wk) produced long-term inhibition of thermal hyperalgesia; and (4) B vitamins did not affect mechanical hyperalgesia or normal pain sensation, and exhibited similar effects on CCD and CCI induced-hyperalgesia.

CONCLUSION: The present studies demonstrate effects of B vitamins on pain and hyperalgesia following primary sensory neurons injury, and suggest the possible clinical utility of B vitamins in the treatment of neuropathic painful conditions following injury, inflammation, degeneration or other disorders in the nervous systems in human beings.

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