Thiamine and cyanocobalamin relieve neuropathic pain in rats: synergy with dexamethasone.

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BACKGROUND: Treatment of neuropathic pain is an area of largely unmet medical need. Therefore, this pain may require the development of novel drug entities. In the search for alternatives, B vitamins have been found to be a clinically useful pharmacological tool for patients with neuropathic pain. However, preclinical studies supporting this use are lacking.

OBJECTIVE AND METHODS: In this study, we assessed the possible antiallodynic effects of thiamine, pyridoxine, and cyanocobalamin as well as dexamethasone and their combination on spinal nerve ligation induced allodynia.

RESULTS: Subcutaneous administration of thiamine (75-600 mg/kg), pyridoxine (75-600 mg/kg), cyanocobalamin (0.75-6 mg/kg), and dexamethasone (4-32 mg/kg) significantly reduced tactile allodynia in rats. Maximal antiallodynic effects were reached with 600 mg/kg of thiamine (approximately 58%), 600 mg/kg of pyridoxine (approximately 22%), 6 mg/kg of cyanocobalamin (approximately 73%), and 32 mg/kg of dexamethasone (approximately 68%). Since a small antiallodynic effect was observed with pyridoxine, this drug was not further analyzed in the combinations. Coadministration of thiamine or cyanocobalamin and dexamethasone remarkably reduced spinal nerve ligation induced allodynia (approximately 90%), showing a synergistic interaction between either thiamine or cyanocobalamin and dexamethasone.

CONCLUSION: Our data indicate that thiamine and pyridoxine as well as the combination of B vitamins and dexamethasone are able to reduce tactile allodynia in rats and suggest the possible clinical use of these drugs in the treatment of neuropathic pain in human beings.

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