

Abstract

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Acetyl-L-carnitine in the management of pain during methadone withdrawal syndrome.

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INTRODUCTION: This study was designed to determine the short-term effect of acetyl-L-carnitine (ALC) on symptoms of withdrawal in opiate-dependent subjects and animals and, in particular, on pain, given the efficacy of ALC in other typologies of pain. The study consists of 2 branches: a clinical study and a preclinical one, both with a randomized placebo-controlled design.

METHODS: Thirty subjects meeting clinical criteria for methadone dependence were consecutively recruited and treated with ALC 2 g/d or placebo for a 3-week detoxification period. Withdrawal symptoms and pain were evaluated through the Short Opiate Withdrawal Syndrome scale, and the Huskisson's analogue scale for pain. In the preclinical study, mice previously received a pretreatment (saline solution or morphine), and subsequently, each group was randomly divided in 4 subgroups that received a treatment of saline, methadone, ALC, or amitriptyline, respectively. Hot plate test and Writhing test were used to evaluate pain intensity.

RESULTS: Average Short Opiate Withdrawal Syndrome total scores during the first 5 days of treatment resulted significantly higher in controls than in the ALC group ($P < 0.05$). Pain scores in the Huskisson's analogue scale were considerably lower in the group of patients taking ALC than in the control group after 1 week of ALC treatment until the end of the study. Results of the preclinical study show that the administration of methadone for 7 days in morphine-tolerant mice did not produce any modification of the pain threshold. By contrast, the 7-day coadministration of methadone and ALC in morphine-tolerant mice induced an analgesic effect evaluated 3 hours after the last injection.

DISCUSSION: Acetyl-L-carnitine acted as an effective antihyperalgesic agent for relieving opiate-withdrawal hyperalgesia in animals and displayed clinical efficacy on other withdrawal symptoms such as muscular tension, muscular cramps, and insomnia. Considering its tolerability, the excellent side effect profile, the absence of significant interactions, and the lack of abuse potential, ALC can be considered as a useful pharmacological adjunct in the treatment of opiate withdrawal.

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