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Role of methionine containing antioxidant combination in the management of pain in chronic pancreatitis: a systematic review and meta-analysis

Rupjyoti Talukdar [1], H V V Murthy [2], D Nageshwar Reddy [3]
Affiliations

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Abstract

Background: Pain in CP results from inflammation and neuroimmune alterations that are associated with oxidative stress, among other mechanisms. This is marked by depletion of antioxidant defenses including methionine, which is a donor of methyl moieties that maintains the acinar transsulfuration pathway. We performed a systematic review and meta-analysis of trials evaluating methionine-containing antioxidants in CP.

Patient and methods: Literature search was conducted in Medline/Pubmed, EMBASE, and Cochrane databases. Systematic review and meta-analysis was performed per PRISMA guidelines. Main study outcome was pain relief. GRADE system was used for quality assessment. Heterogeneity was assessed by the Q and I(2) measures; publication bias by Egger's test. Random-effect model (DerSimonian and Laird) was used if there was heterogeneity.

Results: Eight studies (n = 411) were identified that used methionine-containing antioxidants. The study duration ranged from 10 wks to 12 months. All studies used methionine, organic selenium, ascorbate, beta-carotene and alpha-tocoferol. Four studies (including two RCTs) that reported change in pain scores were metaanalyzed. Though overall effect [standardized difference in means (95% CI)] on pain score reduction was -0.95 (-1.738 to -0.160) (z = -2.36; p = 0.018), the significance was lost when the two RCTs were meta-analyzed. RCTs that reported the number of pain free patients had a statistically significant overall effect of -3.204 (p = 0.001). Though more patients on methionine containing antioxidants had adverse events, majority of them were mild.

Conclusion: Methionine containing antioxidants appear to result in pain reduction in a significant proportion of CP patients. Further randomized controlled trials with homogeneous outcome measures are needed.

Keywords: Antioxidant combination; Chronic pancreatitis; Meta-analysis; Methionine; Pain; Systematic review.

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