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Low Dose Naltrexone In The Management Of Chronic Pain Syndrome: A Meta-Analysis Of Randomized Controlled Clinical Trials

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Abstract

Objective: Chronic pain conditions are among the leading causes of years lost to disability. Low Dose Naltrexone (LDN) has anti-inflammatory and immunomodulatory properties. LDN, by blocking Toll-Like Receptors (TLR), prevents central sensitization and conversion of acute pain state to a state of chronic pain. This meta-analysis compared LDN's effectiveness in chronic pain syndromes based on published randomized trials.

Method: Seven studies were included after a systematic search and screening from PubMed, Embase, Scopus, Cochrane, and clinical trial registries. The efficacy outcome analyzed was the standardized mean difference (SMD), the Cohen's d, of change in pain scores between LDN and the comparator drugs using the random-effect model. Subgroup analyses by condition type and comparator were performed to analyze the effect of LDN. Adverse events were evaluated using incidence rate ratio (IRR), publication bias by funnel plot, risk of bias by Cochrane Risk of Bias tool version 2.0, and certainty of evidence by GRADE evaluation.

Results: LDN did not show a significant difference in pain response compared to control groups [$d = -0.11$ (95%CI -0.96 to 0.74); $P = 0.31$]. In fibromyalgia, LDN had improvement compared to placebo [$d = -0.34$ (95%CI -0.62 to -0.06); $P = 0.0186$]. Against active comparators, LDN had no difference [$d = 0.67$ (95% CI -4.69 to 6.02); $P = 0.35$]. Adverse events were increased with LDN compared to placebo [IRR = 1.4 (95% CI 1.12 to 1.75); $P = 0.0026$] but comparable to active comparators [IRR = 0.55 (95% CI 0.04 to 7.31); $P = 0.65$].

Conclusion: LDN is better than placebo in fibromyalgia pain management, and LDN is similar to active controls in chronic pain management.

Prospero registration number: CRD42024511451.

Keywords: Chronic pain; Fibromyalgia; Low dose naltrexone; Meta-analysis.

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