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The Effects of Alpha-Lipoic Acid Supplementation on Post-Stroke Patients: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Abstract : Background: Alpha lipoic acid (ALA), fat- and water-soluble, coenzyme with sulfuret content, has received considerable attention for its potential therapeutic role in diabetes, cardiovascular diseases, cancers, and central nervous disease. This investigation aims to evaluate the probable protective effects of ALA in stroke patients. Methods: Based on Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines, This meta-analysis was performed. The PICO criteria for this meta-analysis were as follows: Population/Patients (P: stroke patients); Intervention (I: ALA); Comparison (C: control); Outcome (O: blood glucose, lipid profile, oxidative stress, inflammatory factors).In addition, Studies that were excluded from the analysis consisted of in vitro, in vivo, and ex vivo studies, case reports, quasi-experimental studies. Scopus, PubMed, Web of Science, EMBASE databases were searched until August 2023. Results: Of 496 records that were screened in the title/abstract stage, 9 studies were included in this meta-analysis. The sample sizes in the included studies vary between 28 and 90. The result of risk of bias was performed via risk of bias (RoB) in randomized-controlled trials (RCTs) based on the second version of the Cochrane RoB assessment tool. 8 studies had a definitely high risk of bias. Discussion: To the best of our knowledge, The present meta-analysis is the first study addressing the effectiveness of ALA supplementation in enhancing post-stroke metabolic markers, including lipid profile, oxidative stress, and inflammatory indices. It is imperative to acknowledge certain potential limitations inherent in this study. First of all, type of treatment (oral or intravenous infusion) could alter the bioavailability of ALA. Our study had restricted evidence regarding the impact of ALA supplementation on included outcomes. Therefore, further research is warranted to develop into the effects of ALA specifically on inflammation and oxidative stress. Funding: The research protocol was approved and supported by the Student Research Committee, Tabriz University of Medical Sciences (grant number: 72825). Registration: This study was registered in the International prospective register of systematic reviews (PROSPERO ID: CR42023461612).

Keywords : alpha-lipoic acid, lipid profile, blood glucose, inflammatory factors, oxidative stress, meta-analysis, post-stroke
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