Title

Intranasal insulin effect on cognitive and/or memory impairment: a systematic review and meta-analysis

Abstract

Background: Cognitive impairment, characterized by deficits in cognitive functions and loss of delayed and immediate recall, disproportionately affects individuals aged 65 years and older, particularly those with comorbid cardiovascular conditions such as hypertension and diabetes mellitus. Objective: This study aimed to investigate the potential association between intranasal insulin and cognitive and/or memory impairment, with a specific focus on delayed and immediate recall, considering the rising prevalence of cognitive disorders in the aging population. Methodology: Employing a rigorous systematic approach, we conducted a thorough search of MEDLINE, Scopus, the Cochrane database, and Web of Science from inception to November 23, 2022, identifying relevant randomized clinical trials. Our analyses encompassed three key aspects: (i) assessing the impact of intranasal insulin on cognitive impairment, (ii) evaluating its effect on delayed recall, and (iii) examining its influence on immediate recall. Results: Five studies meeting the inclusion criteria were included. The results underscored a statistically significant effect of intranasal insulin on delayed memory (effect size: 1.37; 95% CI: 0.65 to 2.09) and overall cognition (effect size: 0.58; 95% CI: 0.08 to 1.08). However, no statistically significant effect was observed for immediate memory (effect size: 0.48; 95% CI: -0.00 to 0.96). Conclusions: This study provides compelling evidence supporting the significance and efficacy of intranasal insulin in enhancing delayed recall and overall cognition. The observed effects hold promise for potential therapeutic interventions in addressing cognitive deficits associated with aging and comorbid conditions. The findings emphasize the need for further research to elucidate the underlying mechanisms and optimize the application of intranasal

insulin in cognitive enhancement strategies.

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