SRTC2 Student Research & Technology Congress
Congress booklet
خلاصه مقالات، پنل ها و کارگاه ها

Impact of statins on cognitive function

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Abstract

Background and Aim: The brain, being rich in cholesterol, relies on various cholesterol-regulated mechanisms. Disruptions in cholesterol levels are linked to neurodegenerative disorders, elevated amyloid beta and tau phosphorylation levels, and impaired blood flow regulation mechanisms, leading to neurodegenerative diseases and cognitive issues. Statins, known for their cholesterol-lowering properties and anti-inflammatory effects that benefit brain function, are anticipated to help manage and alleviate cognitive impairment. However, it's crucial to acknowledge that abnormal blood cholesterol levels can have serious implications on synaptic function.

Results: Statins come in many forms, including hydrophilic and hydrophobic types, derived from fungal or synthetic sources. The effect of these statins on cognitive function can be affected by the design and duration of the study. Larger studies usually show no effect on cognitive function, while short-term studies often report positive results. Studies have shown that the use of statins may be associated with cognitive function, with some literature suggesting potential differences in efficacy between different statins. There is a lack of consensus regarding the positive impact of simvastatin on cognitive impairment in contrast to atorvastatin and rosuvastatin. The distinction in properties between statins derived from synthetic versus fungal sources is not well defined. While statins are generally more hydrophobic than hydrophilic, there is no clear consensus as to whether this characteristic affects their cognitive effects. Statin users with risk factors like CHD and diabetes may have a more prominent role in treatment. In diabetic patients, there is a notable difference in cognitive performance between statin users and non-users.

Conclusion: The effectiveness of statins in patients is also influenced by comorbidities, with individuals carrying the APOEe4 allele showing greater responses in cognitive function. The current understanding of statins as a therapeutic intervention for cognitive disorders remains uncertain, particularly in light of their varying effects on HDL-C levels and the need for further research into how statins impact HDL levels and cognitive impairment.

Keywords: Statin; Cognitive disorders; Neurodegenerative diseases