Mediterranean diet and its role in mitigating Alzheimer's disease: A review

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ABSTRACT

Introduction: Diet plays a pivotal role in mitigating the risk and progression of Alzheimer's disease (AD) and early cognitive impairment globally. Increasing evidences support the Mediterranean diet (MeDi) as a protective dietary pattern against neurodegenerative diseases, particularly AD. This review aims to examine the core components of the MeDi that contribute to its neuroprotective effects and to explore the underlying protective mechanisms. Given the rising prevalence of AD in Malaysia, integrating MeDi into national healthcare strategies may offer a viable approach to reduce disease burden. **Materials and Methods:** This review encompasses papers of clinical trials (retrospective cohorts, randomised controlled trials, cross-sectional studies), and meta-analyses around the world. A comprehensive literature search was conducted using various databases, including PubMed, Medline, Science Direct, and Google Scholar. The search utilised specific keywords, such as diet, dietary pattern, Mediterranean (MeDi), Alzheimer's, Alzheimer's disease, cognitive impairment, Beta amyloid, Tau protein, brain atrophy, brain volume and gut-brain axis. This review includes only English-language and human studies. The primary aim of this review is to evaluate the latest past ten years (2015-2025) on main diet components and the protective mechanisms behind practising MeDi. **Results:** The Mediterranean diet (MeDi), has long supported health by preventing non-communicable diseases, including cardiovascular and neurodegenerative diseases. Evidence shows the MeDi can reduce beta-amyloid, linked to Alzheimer's disease (AD), and improve cerebral perfusion, particularly in memory-related brain regions, supporting cognitive functions like memory and attention. However, studies often face limitations such as small sample sizes and short durations, which impact the strength of evidence. While global research supports MeDi's potential in mitigating AD, Malaysian-specific studies remain limited. Implementing MeDi in Malaysia faces challenges due to perceptions of high cost, the prevalence of unhealthy, convenient foods, and Westernized eating patterns. Adherence remains crucial for benefits, necessitating culturally adapted strategies that address cost, accessibility, and education to integrate MeDi as a preventive guideline against Alzheimer's in Malaysia. **Conclusion:** Substantial evidence supports the role of the MeDi in slowing the progression of Alzheimer's disease, particularly among older adults. Olive oil remains the main element differentiating it from other types of health diets out there, such as DASH. Benefits from the MeDi are primarily mediated through the reduction of brain beta-amyloid burden, modulation of the gut-brain axis, and improved cerebral perfusion, which collectively help preserve cognitive function. Future clinical research, especially within the Malaysian context is warranted. With proper adaptation, the Mediterranean diet holds promise as a national dietary intervention to combat Alzheimer's disease and support healthy ageing in Malaysia.

Keywords: Diet, dietary pattern, Mediterranean diet (MeDi), Alzheimer's disease, cognitive impairment, Beta amyloid, Tau protein, brain atrophy, brain volume, gut-brain axis