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Abstract: Alzheimer's Disease (AD) has been described as 'one of the most disabling and burdensome health conditions worldwide' and is responsible for approximately 70% of dementia in the elderly. Based on the current prevalence of AD, an aging world population and the associated projected health care requirements, it is estimated that by 2050, the prevalence of AD will reach 104 million with around 43% requiring ongoing health care. If the onset of AD can be reduced by as little as one year, the prevalence could be reduced by 10%. There is substantial commonality in research findings to date around the positive influence of seafood consumption in reducing the risk of dementia and AD. Emerging concern about the sustainability of global fisheries supports the recommendation of selective consumption of sustainable wild caught and increased emphasis on production of farmed fish supplies to meet consumption needs.
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Consumption of Fish and Alzheimer's Disease

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ARTICLE NOTE

Both authors contributed to the development of the Editorial. There are no conflicting interests to declare.

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Editorial

Alzheimer's Disease (AD) has been described as 'one of the most disabling and burdensome health conditions worldwide' [1] and is responsible for approximately 70% of dementia in the elderly [2]. The progressive cognitive decline that is symptomatic of AD leaves sufferers with a high degree of dependence. The subsequent level of care required influences quality of life of patients and their families, and presents a growing challenge for the health care systems of many countries.

In 2006, the global prevalence of AD was estimated as 26.6 million [3] accounting for between 20 and 40% of the population aged over 85 years [4]. Based on the current prevalence of AD, an aging world population and the associated projected health care requirements, it is estimated that by 2050, the prevalence of AD will quadruple [3]. If the onset of AD could be delayed by just one year the 2050 predictions could be reduced by 9.2 million. With around 43% of those with AD requiring hospital or nursing home level care, a reduction in incidence or delay to onset of the disease would have significant cost savings to the health care system. There is increasing substantiation that modifiable lifestyle changes may hold one of the keys to modulate predictions for the future.

A positive link between seafood consumption and cognition has been well established with the reduced risk of dementia thought to be associated with marine long chain omega 3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) [5]. Post humous examinations have revealed that the brains of persons with AD contain less DHA in the grey matter of the frontal lobe and hippocampus [6]. It has also been consistently established by large population based studies linking fish consumption and / or plasma fatty acids that omega 3 fatty acids retard cognitive decline over time [4]. Studies that have contributed to this precept investigate levels of fish or DHA consumption and compare these with biological levels over extended periods of time in order to establish AD risk. Static measurements of blood or brain DHA have not revealed a significant relationship [7].

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Research into AD is problematic. Onset of AD is typically diagnosed in older subjects. The complex interplay between dietary fatty acids can be difficult to quantify in human studies. Retrospective human studies are imperfect and long term controlled longitudinal studies are impractical, however controlled research using animal models has been offered as a potential solution [5]. One such study suggested that high omega 3 fatty acids were beneficial in correcting high levels of brain omega 6 fatty acids in normal subjects thus reducing the potential of damage to the brain [5]. Although this study did not find that the consumption of Omega 3 fatty acids had a positive effect on cognition, it should be noted that supplements rather than whole fish were used. The belief that consumption of fish as a whole food, beyond the omega 3 content of fish, has significant positive impact on human health is gaining momentum in scientific literature. Research conducted on a cohort of 815 participants aged 65 to 94 years found that consumption of fish more than once per week was associated with a 60% decrease in the risk of AD [8]. Of note was that a link was identified between dietary intake of DHA and a reduced risk of AD.

A comprehensive review of the role of nutrition in cognitive decline concluded that more research was required to explore the influence of nutrients, foods and dietary behaviors [9]. Importantly, subjects need to be monitored prior onset of symptoms for sufficiently long durations. The authors review the role of individual nutrients but highlight the link between a Mediterranean type diet, cardiovascular disease, some cancers, mortality and cite an early study demonstrating reduced risk of AD. More recently, further research has revealed that a dietary pattern high in fish, nuts, salad dressings, poultry, tomatoes, fruit, cruciferous and dark green leafy vegetables to be strongly associated with a lower risk of AD [10]. This dietary pattern had a nutrient profile characterized by relatively lower saturated fat, higher polyunsaturated fat, vitamin E and folate. The study found that other healthful behaviors such exercise, low alcohol consumption and avoidance of smoking may add to the positive effect of a healthy diet on AD onset times.

Further research is required to establish stronger links between fish consumption and mental health, cognition, dementia and AD. Evidence that seafood consumption has a therapeutic and preventative effect on general mental health would form the basis of a powerful campaign promoting the consumption of seafood within a healthy dietary pattern. Emerging concern about the sustainability of global fisheries supports the recommendation of selective consumption of sustainable wild caught and increased emphasis on production of farmed fish supplies to meet consumer need.

To conclude, there is substantial commonality in research findings to date around the positive influence of seafood consumption in reducing the risk of dementia and AD. Promotion of the evidence in order to induce an increase in consumption of sustainable seafood within a healthy diet has the potential to significantly reduce the human and public health burden of AD for the future.

Acknowledgements

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