

Neuroprotective and immune effects of active forms of vitamin D₃ and docosahexaenoic acid in Alzheimer disease patients

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ABSTRACT:

Neurodegenerative diseases, in particular Alzheimer disease (AD), afflict an increasing proportion of the older population with aging. Decreased exposure to sunlight and decreased consumption of fish, fruits, and vegetables, are two epidemiological factors that appear to be related to the pandemic of AD. In addition to replacing simple with complex carbohydrates and avoiding saturated fat, two nutritional components, vitamin D (acting through the endogenous hormonal form 1 α ,25 dihydroxyvitamin D, 1,25D) and docosahexaenoic acid (DHA) (acting through the docosanoid lipidic modulators resolvins and neuroprotectins) have high potential for prevention of Alzheimer disease. 1,25D is a neuroprotective, it acts both directly and indirectly in neurons by improving the clearance of amyloid-beta by macrophages/microglia. Resolvins and neuroprotectins inhibit amyloidogenic processing of amyloid-precursor protein, inflammatory cytokines, and apoptosis. It is likely that the increased consumption of vitamin D and fish oil could prevent neurodegeneration in some subjects by maintaining adequate endocrine, paracrine, and/or autocrine production of 1,25D and the DHA-derived lipidic modulators. Before firm recommendations of the dosage can be proposed, however, the in vivo effects of vitamin D₃ and DHA supplementation should be investigated by prospective studies.

Key words: Alzheimer disease, vitamin D₃, DHA, fish oil