A Oulhaj et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
DOI: 10.4172/2161-0460-C1-034

Beneficial interaction between B vitamins and omega-3 fatty acids in slowing brain atrophy and cognitive decline in subjects with Mild Cognitive Impairment (MCI)

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Introduction: Raised plasma homocysteine (tHcy) and low intake of omega-3 long chain fatty acids (FA) are risk factors for Alzheimer's disease (AD). In subjects with MCI the VITACOG trial showed that B-vitamin treatment reduced the brain atrophy rate and slowed cognitive decline. We now show that these effects of B-vitamins are influenced by baseline plasma omega-3 FA concentrations.

Method: The effects of B vitamin intervention in VITACOG subjects was analysed according to baseline omega-3 FA (DHA and EPA) concentrations.

Results: There was a significant interaction (P = 0.024) between B-vitamin treatment and plasma omega-3 FA on brain atrophy rates. In subjects with high omega-3 FA, B-vitamin treatment slowed the atrophy rate by 40% compared with placebo, whereas B-vitamins had no effect on atrophy in subjects with low omega-3 FA. A similar interaction was found between omega-3 FA and the beneficial cognitive effects of B-vitamin treatment: high baseline omega-3 FA levels enhanced the slowing of cognitive decline following B-vitamin treatment.

Conclusion: The beneficial effect of B-vitamin treatment on brain atrophy and cognition was found only in subjects with high plasma omega-3 FA. The results highlight the importance of identifying subgroups likely to benefit in clinical trials. A clinical trial is needed to see if a combination of B-vitamins and omega-3 FA will slow conversion from MCI to AD.

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