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A Prospective Study of Plasma Levels of Alpha-Tocopherol (Vitamin E), Beta-Carotene, and Ascorbic Acid (Vitamin C) and Risk of Developing Alzheimer's Disease in the Baltimore Longitudinal Study of Aging (BLSA/NIA)

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Abstract P04.104

OBJECTIVE: To prospectively examine if plasma levels of the antioxidants [alpha]-tocopherol (vitamin E), [beta]-carotene, or ascorbic acid (vitamin C) affect the risk of developing AD up to 10 years later.

BACKGROUND: Oxidative stress has been implicated in AD. Previous case-control studies demonstrate lower blood levels of vitamins E, C, and A in AD patients when compared to age matched normal subjects. Moreover, an initial trial of antioxidant use in AD suggests delay of functional decline. (Sano et al, N Engl J Med 1997; 336:1216-1222.)

DESIGN/METHODS: Plasma [alpha]-tocopherol and [beta]-carotene were measured in 553 BLSA subjects (average age, 70.0 +/- 8.8 years) and ascorbic acid was measured in 337 subjects (average age, 75.3 +/- 6.6 years) between 1984-1991. Subjects were followed up to 10 years to age at diagnosis of AD (NINCDS criteria) or other dementia, or to age at last visit or death. In the follow-up period, 57 subjects in the[alpha]-tocopherol/[beta]-carotene group and 36 subjects in the ascorbic acid group were diagnosed with AD. The relative risk of developing AD associated with antioxidant plasma levels after adjusting for gender was estimated by a Cox proportional hazards model.

RESULTS: Mean antioxidant plasma levels (+/- SD) were as follows: [alpha]-tocopherol 11.7+/-5.4 [micro]g/ml, [beta]-carotene 0.40+/-0.34 [micro]g/ml, ascorbic acid 1.30+/-0.34 mg/dl. Plasma levels of [alpha]-tocopherol, ascorbic acid, and [beta]-carotene did not significantly affect the risk of developing AD. Relative risks (95% CI) were as follows: [alpha]-tocopherol 0.99 (0.94-1.04), [beta]-carotene 0.93(0.44-1.98), ascorbic acid 0.92 (0.30-2.77).

CONCLUSIONS: In the BLSA cohort, antioxidant plasma levels were not associated with the risk of developing AD up to ten years later. The findings from this prospective study suggest that high plasma concentrations may not confer protection for AD. However, protective effects of antioxidants may be dependent on other factors. Further studies, including randomized clinical trials, are necessary.

Section Description

Poster Presentation IV; Wednesday, April 29; 3:00 PM-7:00 PM; Minneapolis Convention Center Exhibit Hall 3; Posters Displayed; 3:00 PM-7:00 PM; Senior Authors Stand by Posters; 5:30 PM-7:00 PM

Aging and Dementia: Epidemiology