

# Abstract

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## Plasma tocopherols and risk of cognitive impairment in an elderly Italian cohort.

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**BACKGROUND:** Evidence that vitamin E may preserve cognitive function in elderly subjects is conflicting. The most abundant and most investigated form of vitamin E in humans is alpha-tocopherol, but other antioxidant tocopherols (beta, gamma, and delta) exist in nature.

**OBJECTIVE:** We aimed to investigate plasma concentrations of the natural tocopherols and the tocopherol oxidation markers alpha-tocopherylquinone (alphaTQ) and 5-nitro-gamma-tocopherol (5NGT) in relation to cognitive function in the elderly.

**DESIGN:** Baseline plasma tocopherols and their oxidation markers were measured in 761 elderly Italian subjects from a population-based cohort assessed in 1999-2000 for mild cognitive impairment (MCI) and dementia. In 2003-2004, information about cognitive status was collected for 615 of the 666 subjects without baseline cognitive impairment. Tocopherols and oxidation markers were analyzed as plasma absolute values divided by serum total cholesterol because lipids affect their blood availability. Analyses were adjusted for sociodemographic, genetic, lifestyle, and medical confounders.

**RESULTS:** Compared with the corresponding lowest tertile, the risk of prevalent dementia was higher for the highest tertile of delta-tocopherol/cholesterol [odds ratio (OR): 3.87; 95% CI: 1.46, 10.27] and alphaTQ/cholesterol (4.02; 1.45, 11.14), but the risk of incident dementia was not directly associated with plasma vitamin E metabolites. A U-shaped association, with lower risk for intermediate tertiles, was found for prevalent MCI with 5NGT/cholesterol (0.39; 0.17, 0.91) and for incident dementia with gamma-tocopherol/cholesterol (hazard ratio: 0.42; 95% CI: 0.22, 0.84).

**CONCLUSIONS:** Plasma concentrations of some non-alpha-tocopherol forms of vitamin E are associated with cognitive impairment in elderly people. However, the associations depend on concurrent cholesterol concentration and need further investigation.

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