

**Reduced Risk of Alzheimer Disease in Users of Antioxidant Vitamin Supplements
The Cache County Study [Utah]**

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FROM ABSTRACT

Background:

Antioxidants may protect the aging brain against oxidative damage associated with pathological changes of Alzheimer disease (AD).

Objective:

To examine the relationship between antioxidant supplement use and risk of AD.

Design:

Cross-sectional and prospective study of dementia.

Elderly (65 years or older) county residents were assessed in 1995 to 1997 for prevalent dementia and AD, and again in 1998 to 2000 for incident illness.

Participants:

Among 4,740 respondents (93%) with data sufficient to determine cognitive status at the initial assessment, we identified 200 prevalent cases of AD. Among 3,227 survivors at risk, we identified 104 incident AD cases at follow-up.

Results:

Use of vitamin E and C (ascorbic acid) supplements in combination was associated with reduced AD prevalence.

[78% reduction, with a range of 60 – 95% reduction].

A trend toward lower AD risk was also evident in users of vitamin E and multivitamins containing vitamin C, but we saw no evidence of a protective effect with use of vitamin E or vitamin C supplements alone, with multivitamins alone, or with vitamin B-complex supplements. **[IMPORTANT]**

Conclusions:

Use of vitamin E and vitamin C supplements in combination is associated with reduced prevalence and incidence of AD.

Antioxidant supplements merit further study as agents for the primary prevention of AD.

THESE AUTHORS ALSO NOTE:

Incidence of Alzheimer disease (AD) will increase as people live longer, so strategies for the prevention of AD are important.

"Because judicious doses of antioxidant vitamin supplements are relatively nontoxic and may have wide-ranging health benefits, antioxidants may offer an attractive prevention strategy."

"Antioxidants scavenge free radicals and other reactive oxygen species that damage cellular membranes, organelles, and macromolecules."

"Accumulation of reactive oxygen species may overwhelm the protective reserves of antioxidants in cells (oxidative stress)."

"In neurons, which are especially vulnerable to free radical-mediated damage, these processes may be important in aging of the brain and the pathogenesis of AD."

"Intake of antioxidants in the diet or, more powerfully, in nutritional supplements may be neuroprotective."

"Antioxidants may mitigate age-related cognitive decline." **[IMPORTANT]**

RESULTS

"Use of vitamin E, vitamin C, and multivitamins were all inversely associated with prevalent AD."

"There was no association between use of B-complex vitamins and AD prevalence."

"Use of multivitamins alone was not notably related to AD risk."

"There was no appreciable association with the use of vitamin C alone, vitamin E alone, or vitamin C and multivitamins in combination."

"There was, however, a significant inverse association with the use of multivitamins alone, and a suggestion of a stronger inverse association with the combination of vitamin E and multivitamins."

"By far, the strongest inverse association with AD prevalence was observed with use of both vitamin E and vitamin C, with or without concomitant use of multivitamins."

COMMENT FROM AUTHORS

“Both prevalence and incidence analyses suggested that use of vitamin E supplements is associated with reduced occurrence of AD.”

“This inverse association with vitamin E appears attributable almost entirely to the use of vitamin E and C supplements in combination.”

“There was no notable reduction in risk of incident AD with vitamin E or vitamin C alone or with multivitamins.”

“There was also no association between AD risk and use of B-complex vitamins.”

The Institute of Medicine recommended daily allowance for vitamin E is 22 IU (15 mg), and for vitamin C (ascorbic acid), 75 to 90 mg. Multivitamin preparations typically contain these approximate quantities of both vitamins E and C.

This study shows that individual supplements of higher doses of vitamin E and vitamin C give the greatest benefit in reduced incidence of AD.

Typically vitamin doses were up to 1000 IU of vitamin E and 500 - 1000 mg of vitamin C.

“Our findings suggest that vitamins E and C may offer protection against AD when taken together in the higher doses available from individual supplements.”

Vitamin E is a strong lipid-soluble antioxidants.

“Sufficient levels of vitamin E may reduce the oxidative stress-related damage associated with pathological changes of AD.”

After the latter has been oxidized [by giving an electron to a free radical], it can be reduced [recharged/replenished] by the water-soluble vitamin C. This is the biological rationale for benefit from combining vitamin E and C dosage, as observed in this study.

The benefits noted in this study from taking vitamin E and vitamin C supplements was noted in those who had been taking the combination for 2 or more years.

“This study suggest that antioxidant vitamins, specifically the combination of vitamin E and C supplements, may prevent AD.”

KEY POINTS FROM DAN MURPHY

- 1) Vitamin C and E are antioxidants.
- 2) Antioxidants scavenge free radicals and other reactive oxygen species that damage cellular membranes, organelles, and macromolecules.
- 3) Accumulation of reactive oxygen species may overwhelm the protection given by antioxidants in cells.
- 4) Neurons are most vulnerable to free radical-mediated damage, which is important in aging of the brain and the pathogenesis of Alzheimer's disease.
- 5) Supplemental antioxidants are more powerful than dietary food antioxidants, and therefore are more neuroprotective.
- 6) Use of vitamin E and C supplements in combination is associated with a 78% (range 60 – 95%) reduced occurrence of Alzheimer disease.
- 7) The doses required to obtain this benefit was 500 – 1000 mg of vitamin C and 400 – 1000 IU of vitamin E, for a minimum of 2 years duration.
- 8) Antioxidants offer an attractive prevention strategy against Alzheimer's disease.
- 9) Antioxidants may mitigate age-related cognitive decline.