Clinical trial examines antioxidant effects for Alzheimer's disease on cerebrospinal fluid biomarkers

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An antioxidant combination of vitamin E, vitamin C and α-lipoic acid (E/C/ALA) was not associated with changes in some cerebrospinal fluid biomarkers related to Alzheimer disease in a randomized controlled trial, according to a study published Online First by *Archives of Neurology*.

Oxidative damage in the brain is associated with aging and is widespread in Alzheimer disease (AD) patients. Some observational studies have suggested that an antioxidant-rich diet may reduce the risk of AD, but antioxidant randomized clinical trials in AD have had mixed results, the authors write in their study background.

Douglas R. Galasko, M.D., of the University of California, San Diego, and colleagues examined changes in cerebrospinal fluid (CSF) biomarkers related to Alzheimer disease and oxidative stress, cognition and function.

The study included 78 patients from the Alzheimer's Disease Cooperative Study (ADCS) Antioxidant Biomarker study who were divided into one of three groups: 800 IU/per day of vitamin E (α-tocopherol) plus 500 mg/per day of vitamin C plus 900 mg/per day of α-lipoic acid (E/C/ALA); 400 mg of coenzyme Q (CoQ) three times a day; or placebo. Sixty-six patients provided serial CSF specimens adequate for biochemical analyses during the 16-week trial.

"The combination of E/C/ALA did not affect CSF biomarkers related to Aβ, tau or P-tau (which are related to AD)," the authors comment.

The E/C/ALA group did see a lowering of CSF F2-isoprostane levels suggesting a reduction of oxidative stress in the brain, the results indicate. However, the treatment raised caution about faster cognitive decline as assessed by the Mini-Mental State Examination (MMSE).

"It is unclear whether the relatively small reduction in CSF F2-isoprostane level seen in this study may lead to clinical benefits in AD. The more rapid MMSE score decline raises a caution and indicates that cognitive performance would need to be assessed if a longer-term clinical trial of this antioxidant combination is considered," the authors conclude.

The authors also note the results indicate that while CoQ was safe and well tolerated in patients, the absence of a biomarker signal in CSF suggests that CoQ, at the tested dose, does not improve indices of oxidative stress or neurodegeneration.

"These results do not support further clinical trial development of CoQ in AD," the researchers conclude.

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