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Diet, nutrient levels linked to cognitive ability, brain shrinkage

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New research has found that elderly people with higher levels of several vitamins and omega 3 fatty acids in their blood had better performance on mental acuity tests and less of the brain shrinkage typical of Alzheimer's disease – while "junk food" diets produced just the opposite result.

The study was among the first of its type to specifically measure a wide range of blood nutrient levels instead of basing findings on less precise data such as food questionnaires, and found positive effects of high levels of vitamins B, C, D, E and the healthy oils most commonly found in fish.

The research was done by scientists from the Oregon Health and Science University in Portland, Ore., and the Linus Pauling Institute at Oregon State University. It was published today in *Neurology*, the medical journal of the American Academy of Neurology.

"This approach clearly shows the biological and neurological activity that's associated with actual nutrient levels, both good and bad," said Maret Traber, a principal investigator with the Linus Pauling Institute and co-author on the study.

"The vitamins and nutrients you get from eating a wide range of fruits, vegetables and fish can be measured in blood biomarkers," Traber said. "I'm a firm believer these nutrients have strong potential to protect your brain and make it work better."

The study was done with 104 people, at an average age of 87, with no special risk factors for memory or mental acuity. It tested 30 different nutrient biomarkers in their blood, and 42 participants also had MRI scans to measure their brain volume.

"These findings are based on average people eating average American diets," Traber said. "If anyone right now is considering a New Year's resolution to improve their diet, this would certainly give them another reason to eat more fruits and vegetables."

Among the findings and observations:

- The most favorable cognitive outcomes and brain size measurements were associated with two dietary patterns – high levels of marine fatty acids, and high levels of vitamins B, C, D and E.
- Consistently worse cognitive performance was associated with a higher intake of the type of trans-fats found in baked and fried foods, margarine, fast food and other less-healthy dietary choices.
- The range of demographic and lifestyle habits examined included age, gender, education, smoking, drinking, blood pressure, body mass index and many others.
- The use of blood analysis helped to eliminate issues such as people's flawed recollection of what they ate, and personal variability in nutrients absorbed.
- Much of the variation in mental performance depended on factors such as age or education, but nutrient status accounted for 17 percent of thinking and memory scores and 37 percent of the variation in brain size.
- Cognitive changes related to different diets may be due both to impacts on brain size and cardiovascular function.

The epidemiology of Alzheimer's disease has suggested a role for nutrition, the researchers said in their study, but previous research using conventional analysis, and looking in isolation at single nutrients or small groups, have been disappointing. The study of 30 different blood nutrient levels done in this research reflects a wider range of nutrients and adds specificity to the findings.

The study needs to be confirmed with further research and other variables tested, the scientists said.

Provided by Oregon State University

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