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Mediterranean Diet May Preserve Brain Structural Connectivity

Megan Brooks | |August 07, 2015

The Mediterranean diet may help preserve structural connectivity in the brain in older adults, results of a French study hint.

Greater adherence to the Mediterranean diet was associated with preserved microstructure in extensive areas of the white matter up to a decade later, the study team found. And this appeared to be related to strong cognitive benefit, equal to up to 10 years of delayed cognitive aging for those with the greatest adherence, they say.

"This is to our knowledge the first study investigating the associations of the Mediterranean diet to brain structure in humans, focusing not only on grey matter volume but also on white matter architecture (a more novel marker of brain health)," Cecilia Samieri, PhD, from University of Bordeaux, France, told *Medscape Medical News.*

"The findings give mechanistic clues on the link between the Mediterranean diet and lower cognitive aging which have been suggested in previous research," she said.

Dr Cecilia Samieri

The study was published online July 16 in *Alzheimer's & Dementia.*

White Matter Preservation

The Mediterranean diet has been associated with a lower risk for Alzheimer's disease, but the underlying mechanisms have been unclear.

The new findings are based on 146 nondemented older adults in the Bordeaux Three-City study, a prospective cohort initiated in 1999-2000 to study vascular risk factors for dementia. Participants provided information on their diet in 2001-2002 (at a mean age of 73 years), underwent brain MRI an average of 9 years later (including diffusion tensor imaging), were free of tumor or major cerebrovascular pathology at MRI, and had no missing data for key potential confounding factors.

On the basis of dietary assessment, 26% of participants had a low Mediterranean diet (MedDi) score of 0 to 3, indicating poor adherence to the diet; 47% had medium scores (4 or 5); and 27% had higher scores (6 to 8) representing the best adherence to the diet.

Compared with those who had medium or high MeDi scores, those with low scores were more apt to be smokers and had slightly higher body mass index. They also got less regular physical activity, although the difference was not statistically significant. Age, education, *APOE4* carrier status, history of cardiovascular disease, hypertension, and hypercholesterolemia were similar in the three MedDi adherence categories.

In adjusted analysis, there was no significant association between the MedDi score and grey matter or white matter volume. However, there was a strong association between the MedDi and diffusion tensor imaging patterns, suggesting that higher MeDi adherence was associated with a "general pattern of preserved WM [white matter] microstructure in multiple bundles," the researchers say. And preserved white matter microstructure with higher adherence to the MedDi "appeared to delay cognitive aging by up to 10 years."

"Our results suggest that the Mediterranean diet helps preserve the connections between neurons, which appear to be damaged with aging, vascular brain diseases and neurodegenerative diseases such as Alzheimer's dementia," Dr Samieri told *Medscape Medical News.*

"In addition, the regions which appeared preserved with greater adherence to the Mediterranean diet were extended and were not specific to a particular disease, suggesting that the Mediterranean diet may have the potential to prevent not only stroke (as previously demonstrated with the PREDIMED [Prevención con Dieta Mediterránea] trial) but also multiple age-related brain pathologies," she added.

The added finding that none of the individual components of the Mediterranean diet was strongly associated with imaging results "supports our hypothesis that overall diet quality may be more important to preserve brain structure than any single food," they write.

Findings Plausible

In an interview with *Medscape Medical News*, Keith Fargo, PhD, director of scientific programs and outreach at the Alzheimer's Association, said this study suggests that the Mediterranean diet may help preserve structural connectivity in the brain, and the authors suggest this may be mediated by a favorable effect on the vascular system in the brain.

These findings and conclusions are "sensible," Dr Fargo said. "One study can't tell the whole story, but it is consistent with the idea that the Mediterranean diet may have some beneficial effect for your brain vasculature, which could account for some of the cognitive effects some studies are seeing."

Dr Fargo said it's important to note that the study was small and diet was assessed only at one time point and brain structure measured 9 years later. "Whether patients maintained the Mediterranean diet over time is unknown," he said.

"This is an observational not an interventional study, which is ultimately needed to determine whether there really is an effect. There may be something else about people that makes them both more likely to eat a Mediterranean diet and more likely to have preserved white matter structure as they age," Dr Fargo said.

Nonetheless, he said, the findings support a growing literature indicating that diet does matter to brain health.

Alzheimers Dement. Published online July 16, 2015. Abstract

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Cite this article: Mediterranean Diet May Preserve Brain Structural Connectivity. *Medscape*. Aug 07, 2015.