

# Moderate Adherence to MIND Diet May Protect Against Alzheimer's Disease

Those with high adherence to the Mediterranean and DASH diets also may have reduced risk.

Moderate adherence to a diet that combines elements of the Mediterranean diet and the Dietary Approaches to Stop Hypertension (DASH) diet may significantly lower the risk of developing Alzheimer's disease, according to research published online ahead of print February 11 in *Alzheimer's & Dementia*. In addition, high adherence to all three diets may reduce the risk of developing Alzheimer's disease, researchers concluded.

Martha Clare Morris, PhD, a nutritional epidemiologist at Rush University Medical Center in Chicago, and colleagues used food frequency questionnaires to evaluate what 923 people, ages 58 to 98, already were eating and scored how closely each participant's diet adhered to the Mediterranean and DASH diets and to the hybrid diet, called MIND, for Mediterranean-DASH Intervention for Neurodegenerative Delay. Dr. Morris and her team designed the MIND diet to emphasize foods that prior studies have found to be associated with brain health, including leafy green vegetables and berries.

The participants were volunteers in the ongoing Rush Memory and Aging Project (MAP), a study of people living in retirement communities and senior public housing in the Chicago area. Participants did not have Alzheimer's disease at baseline. Clinicians determined diagnoses of probable Alzheimer's disease at annual neurologic examinations. A total of 144 cases of Alzheimer's disease developed over an average follow-up of four and a half years.

## Diet Scores Based on Food Frequency Questionnaire

Diet adherence scores were computed from responses to a modified version of the Harvard food frequency questionnaire that was validated for use in older Chicago community residents. Participants were asked to report usual frequency of intake over the previous year of 144 food items.

The MIND diet score had 15 dietary components, including 10 brain-healthy food groups (ie, green leafy vegetables, other vegetables, nuts, berries, beans, whole grains, fish, poultry, olive oil, and wine) and five unhealthy food groups (ie, red meats, butter and stick margarine, cheese, pastries and sweets, and fried or fast food). Researchers assigned a concordance score of 0, 0.5, or 1, for a total score ranging from 0 to 15. The DASH diet scoring was based on seven food groups and three dietary components (ie, total fat, saturated fat, and sodium), each scored 0, 0.5, or 1, for a total score ranging from 0 to 10. The Mediterranean diet score was based on scoring that used serving quantities of the traditional Greek Mediterranean diet as the standard. It included 11 dietary components, each scored from 0 to 5, for a total score ranging from 0 to 55.

For each diet, researchers sorted participants' scores into the top, middle, and bottom tertiles. The top tertiles comprised scores that represent-

ed the highest adherence to the diets. For the MIND diet, the estimated effect—adjusted for age, sex, education, APOE ε4, total energy intake, physical activity, and participation in cognitively stimulating activities—was a 53% reduction in the rate of Alzheimer's disease for those in the top tertile, compared with those in the bottom tertile. For the middle tertile, there was a 35% reduction in risk, compared with the bottom tertile.

**For the MIND diet, the estimated effect was a 35% reduction in the rate of Alzheimer's disease for those in the middle tertile of adherence, compared with those in the bottom tertile.**

ed the highest adherence to the diets. For the MIND diet, the estimated effect—adjusted for age, sex, education, APOE ε4, total energy intake, physical activity, and participation in cognitively stimulating activities—was a 53% reduction in the rate of Alzheimer's disease for those in the top tertile, compared with those in the bottom tertile. For the middle tertile, there was a 35% reduction in risk, compared with the bottom tertile.

For the Mediterranean diet, those in the top tertile had a 54% reduced risk of developing Alzheimer's dis-

ease, compared with those in the bottom tertile. For the DASH diet, the top tertile had a 39% reduced risk of developing Alzheimer's disease, compared with the bottom tertile. The middle tertiles for the DASH and Mediterranean diets were not associated with significantly reduced risk.

## An Emphasis on Neuroprotection

Like the Mediterranean and DASH diets, the MIND diet emphasizes natural plant-based foods and limited intake of animal-based foods and foods high in saturated fat. The MIND diet, however, does not specify high fruit consumption (compared with three to four servings per day in the DASH and Mediterranean diets), high dairy consumption (compared with two



Martha Clare Morris, PhD

within two years. Eliminating those cases did not change the overall results. Further elimination of 60 patients with Alzheimer's disease who were diagnosed within three years had minimal impact on the estimated effects, although the reduced risk for the middle tertile was only marginally statistically

significant when those cases were eliminated.

While the study had a relatively short follow-up period, in an earlier study of the MAP participants, the researchers reported slower cognitive decline with higher MIND scores over as long as 10 years of follow-up. In that prior study, the authors observed a stronger inverse association between the MIND diet and cognitive decline than for either the Mediterranean or DASH diets. "This [result] suggests that the MIND diet is not specific to the underlying pathology of Alzheimer's disease, but perhaps [to] better overall functioning and protection of the brain," the authors said.

Randomized dietary intervention trials are needed to attribute causal effects of the diet patterns to the development of Alzheimer's disease, the authors said. The authors noted the limited information from the food frequency questionnaire was among the study's limitations. For example, the question about berry consumption was based on a single item for strawberries, not other berry types, and the response options ranged from "never" to "two or more times per week."

"Based on this study, high-quality diets such as the Mediterranean and DASH diets can be modified, such as in the MIND diet, to provide better protection against dementia," the authors concluded.

NR

## Suggested Reading

Morris MC, Tangney GC, Wang Y, et al. MIND diet with reduced incidence of Alzheimer's disease. *Dement*. 2015 February 11 [Epub ahead of print].