ALZHEIMER DISEASE

Eating a combination of healthy foods lowers the risk of developing Alzheimer disease

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A diet rich in nuts, vegetables, fish and poultry can reduce the risk of developing Alzheimer disease (AD), according to the results of a study by Yian Gu and colleagues at the Columbia University Medical Center in New York. Their research, published in *Archives of Neurology*, suggests that the combinations of foods and nutrients consumed might influence disease risk more than the individual foods themselves.

Diet is one of the most important modifiable environmental risk factors in AD, and previous studies have focused on specific foods and nutrients that might be protective against this neurodegenerative disease. This approach has identified 'good' foods, but has neglected the combinatory nature of modern diets and the interactions that occur between nutrients. An alternative approach has employed dietary pattern (DP) analysis to assess the link between nutrition and cognitive decline. Following a Mediterranean diet (MeDi) can lower the risk of AD, which suggests that this combination of foods confers a protective effect. However, the MeDi is a specific and limited diet, and adherence to it is likely to be variable in multiethnic populations outside of Mediterranean countries.

A third approach derives DPs from a study's population (by statistical analysis of eating habits) and combines these data with what is known about nutrient-specific associations with a disease. Use of this method has identified DPs that have strong associations with disease risk for cancers, diabetes mellitus and coronary heart disease. Yu *et al.* have applied this approach in the field of neurology for the first time to assess the impact of food combinations on AD risk.

The researchers studied 2,148 individuals over 65 years of age in the New York area. According to neurological assessment, these individuals were dementia free at baseline. Dietary habits were assessed using a food frequency questionnaire that measured the intake of 61 foods from 30 food groups over the previous year. From this survey, the consumption of seven 'key' nutrients was calculated. The investigators identified seven distinct DPs in the study cohort.

Over an average follow-up period of 3.9 years, 253 (11.9%) participants developed dementia. One DP (DP2) was associated with AD risk, with stronger adherence to it markedly reducing the risk of AD development.

According to the paper, DP2 is characterized by a high intake of "salad dressings, nuts, fish, tomatoes, poultry, cruciferous vegetables, fruits, and dark green leafy vegetables", and a low intake of "high-fat dairy, red meat, organ meat, and butter." This diet is rich in polyunsaturated fatty acids, vitamin E and folate, and low in saturated fatty acids and vitamin B_{12}. These findings suggest that eating this combination of foods can reduce the risk of AD. The study also supports the idea that DP analysis is a better approach than analysis of individual foods or nutrients for assessing the association between diet and cognitive decline.

Yu *et al.* acknowledge some limitations in their work. DP information was only collected for the year preceding the study, although follow-ups indicated that DPs are generally stable. Also, dropouts from the initial sample of 4,166 could have introduced a selection bias.

The foods comprising DP2 in this study are generally considered to be components of a healthy and balanced diet. DP2 is also very similar to the MeDi, but could be of more clinical utility as it is derived from naturally occurring DPs in the population. As Martha Clare Morris, Director of the Section of Nutrition and Nutritional Epidemiology at Rush University, points out, "it is much easier to increase or avoid individual food items typically consumed within one's own ethnic culture than to assume another culture's diet."

According to Morris, future work should assess the impact of food combinations on cognitive decline in other cultures, while continuing to "investigate the associations of individual dietary components on the development of dementia". Some foods "may not be associated with disease prevention, but [are] simply correlated with other preventive foods", she says. Similarly, vitamin B_{12} might be a marker of red meat intake, rather than being associated with cognitive decline itself. The study by Yu *et al.* was informed by previous nutrient-specific evidence, so further progress in this area may lead to more-accurate DP analyses.

Eleanor Beal