

A 'heart healthy' diet and ongoing, moderate physical activity may protect against cognitive decline

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Eating a "heart healthy" diet and maintaining or increasing participation in moderate physical activity may help preserve our memory and thinking abilities as we age, according to new research reported today at the Alzheimer's Association 2009 International Conference on Alzheimer's Disease (ICAD 2009) in Vienna.

"We can't do anything about aging or family history, but research continues to show us that there are lifestyle decisions we all can make to keep our brains healthier, and that also may lower our risk of memory decline as we age," said William Thies, PhD, Chief Medical & Scientific Officer at the Alzheimer's Association.

Dietary Approaches to Stop Hypertension (DASH) Eating Pattern May Reduce Age-Related Cognitive Decline

The Dietary Approaches to Stop Hypertension (DASH) diet is often recommended by physicians to people with high blood pressure or pre-hypertension. The DASH diet eating plan has been proven to lower blood pressure in studies sponsored by the National Institutes of Health. High blood pressure is considered a risk factor for Alzheimer's and dementia.

Heidi Wengreen, RD, PhD, Assistant Professor of Nutrition at Utah State University, and colleagues examined associations between how closely people adhered to the DASH diet and risk of cognitive decline and dementia among older participants in the Cache County Study on Memory, Health and Aging.

In 1995, 3,831 study participants 65 years of age or older completed a survey that included a food frequency questionnaire and cognitive assessment. Cognitive function was checked again during four assessments over 11 years using the Modified Mini-Mental State examination (3MS), which is graded on a 100 point scale. A DASH diet adherence score was created based on consumption levels of nine food-group/nutrient components -- fruit, vegetables, nut/legumes, whole grains, low-fat dairy, sodium, sweets, non-fish meat, and fish. Participants were ranked by DASH score into five groups, or quintiles.

The researchers found that higher DASH scores were associated with higher scores for cognitive functioning at the beginning of the study and over time. Those in the highest quintile scored 1.42 points higher at baseline and 1.81 points higher after 11 years on the 3MS than did those in the lowest quintile of the DASH score (p-values

They also found that four of the nine food-group/nutrient components used to create the DASH score were independently associated with 3MS scores -- vegetables, whole grains, low-fat dairy, nut/legumes. The scientists created a diet adherence score based on just these four components which they then tested for association with changes in cognitive abilities on the 3MS. Those in the highest quintile scored 1.72 points higher at baseline and 3.73 points higher after 11 years than did those in the lowest quintile of the four-component score (p-values

"Our results suggest that including whole grains, vegetables, low-fat dairy foods, and nuts in one's diet may offer benefits for cognition in

late life," Wengreen said. "However, we need more research before we can confidently say how much of these foods to include in your diet to experience some benefit."

Maintaining or Increasing Activity Levels May Slow Cognitive Decline in Elderly

Studies have found that older adults who are physically active may experience slower rates of cognitive decline. Less is known about the impact of changes in physical activity levels on rate of cognitive decline.

Deborah E. Barnes, PhD, MPH, Assistant Professor of Psychiatry at the University of California, San Francisco, and a geriatrics researcher at the San Francisco VA Medical Center, and colleagues studied changes in levels of both physical activity and cognitive function over seven years in 3,075 white and black elders aged 70-79 years in the Health, Aging and Body Composition Study. Physical activity was assessed based on self-reported number of minutes walked per week at the beginning of the study and after two, four, and seven years of follow-up. Participants were classified at each time point as sedentary (0 minutes per week), low (less than 150 minutes per week) or high (150 minutes per week or more). Changes over time were classified as consistently sedentary, maintaining (low or high), decreasing, or increasing/fluctuating. Cognitive function was assessed using the 3MS.

The researchers found that 21% of study participants were consistently sedentary, 12% maintained their activity levels, 26% had declining levels, and 41% had increasing or fluctuating levels. After adjustment for age, sex, race, education, study site, diabetes, hypertension, smoking, alcohol consumption and baseline 3MS score, they found that the mean rate of decline in 3MS scores was 0.62 points/year in those who were consistently sedentary, 0.54 points/year ($p=0.30$) in those with declining

activity levels, 0.44 points/year ($p=0.01$) in those with increasing/fluctuating activity levels, and 0.40 points/year ($p=0.04$) in those who maintained their activity levels.

"We found that older adults who were sedentary throughout the study had the lowest levels of cognitive function at the beginning and experienced the fastest rate of cognitive decline," Barnes said.

"Cognitive decline also was faster in those whose physical activity levels consistently declined during the study period."

According to the researchers, sedentary elders who began new aerobic exercise programs experienced improvements in cognitive function, especially the ability to process complex information quickly. "Sedentary individuals should be encouraged to engage in physical activity at least occasionally," Barnes said. "People who are currently active should be encouraged to maintain or increase their activity levels."

Moderate Long-Term Physical Activity May Improve Late Life Cognition; Long-Term Strenuous Activity May Increase Risk of Cognitive Impairment

Long-term strenuous physical activity has been shown to decrease lifetime exposure to ovarian hormones in women and has been found to play a protective role against breast cancer. However reduction in ovarian hormone exposure has been associated with increased risk of cognitive impairment. At the same time, long-term physical activity is associated with improved cognition but the intensity required to preserve cognition is not known.

Mary C. Tierney, PhD, CPsych, Professor of Family and Community Medicine at the University of Toronto, and Senior Scientist and Director, Geriatric Research Unit, Brain Sciences Program at

Sunnybrook Health Sciences Centre, and colleagues sought to examine the associations between both long-term strenuous and moderate activity levels and cognition in recently postmenopausal women.

Study participants were 90 women aged 50-63 years, one to 10 years post natural menopause, with no history of breast cancer, HRT use, psychiatric disorder, dementia or other neurological condition. Participants gave details on the amount of their strenuous and moderate physical recreational activities from high school to menopause. Eight memory and brain function tests were administered to all participants.

After adjusting for age, education, reproductive years, cigarette smoking, alcohol consumption, parity, and periods of amenorrhea, the researchers found that long-term strenuous activity was consistently associated with poorer performance on all eight of the tests; with statistically significant results on tests of semantic memory, working memory, delayed verbal recall, and sustained attention (p

"Our results suggest that long-term strenuous activity may increase the risk of cognitive impairment in recently postmenopausal women," Tierney said. "On the other hand, moderate long-term physical activity may improve later life cognition. These preliminary findings have important implications for women's health and support the need for large-scale studies including both women and men."

Alzheimer's Risk Gene May Reduce Benefits of Physical Activity to Cognitive Ability

While the relationship of physical activity with cognitive performance as we age is a subject of considerable research, much less is known about how this relationship is impacted by the Alzheimer's risk gene Apolipoprotein E (APOE). The APOE gene comes in three types, or

alleles, known as e2, e3, and e4. Each person gets one type of APOE from each parent, making the possible combinations: e2/e2, e2/e3, e2/e4, e3/e3, e3/e4, e4/e4. Having two copies of e4 conveys the highest risk for Alzheimer's; having one e4 also raises one's risk. E3 is the most common type. E2, though rare, is thought to be protective.

Thomas Obisesan, MD, MPH, FAAFP, Chief of the Division of Geriatrics at Howard University Hospital and professor of medicine at Howard University College of Medicine, Washington, D.C., and colleagues examined this issue using data from The Third National Health and Nutrition Examination Survey (NHANES III, 1988-1994). They identified 1,799 men and women age 60 and older who had data on levels of aerobic-related physical activity (AR-PA), such as walking, jogging, bicycling or swimming; mental status test scores; and APOE genotype.

In their analysis, the researchers found that physical activity was associated with enhanced cognitive function, and that this relationship was differentially influenced by the person's APOE genotype: non-E4 carriers and people with one copy of E4 performed better than people with two copies of E4. After adjusting for age, ethnicity, severe chronic medical illness, lean body mass, and education, aerobic physical activity continued to show a statistically significant association with cognitive function in non-E4 carriers but not in people with E4 (any combination)

"In our nationally representative sample, persons who reported higher levels of aerobic physical activity had better memory than those who reported no such activity. This was especially true in those people who didn't have the APOE-e4 Alzheimer's risk gene," Obisesan said.

"Because [physical activity](#) is a low-cost, low-risk, readily available intervention, it may prove to be an important public health strategy to reduce or prevent memory loss and other symptoms of mental decline in

the elderly. Future rigorous clinical trials are needed to confirm these findings," Obisesan added.

Source: Alzheimer's Association

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