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Exercise associated with preventing, improving mild cognitive impairment

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Moderate physical activity performed in midlife or later appears to be associated with a reduced risk of mild cognitive impairment, whereas a six-month high-intensity aerobic exercise program may improve cognitive function in individuals who already have the condition, according to two reports in the January issue of *Archives of Neurology,* one of the JAMA/Archives journals.

Mild cognitive impairment is an intermediate state between the normal thinking, learning and memory changes that occur with age and dementia, according to background information in one of the articles. Each year, 10 percent to 15 percent of individuals with mild cognitive impairment will develop dementia, as compared with 1 percent to 2 percent of the general population. Previous studies in animals and humans have suggested that exercise may improve cognitive function.

In one article, Laura D. Baker, Ph.D., of the University of Washington School of Medicine and Veterans Affairs Puget Sound Health Care System, Seattle, and colleagues report the results of a randomized, controlled clinical trial involving 33 adults with mild cognitive impairment (17 women, average age 70). A group of 23 were randomly assigned to an aerobic exercise group and exercised at high intensity levels under the supervision of a trainer for 45 to 60 minutes per day, four days per week. The control group of 10 individuals performed supervised stretching exercises according to the same schedule but kept their heart rate low. Fitness testing, body fat analysis, blood tests of metabolic markers and cognitive functions were assessed before, during

and after the six-month trial.

A total of 29 participants completed the study. Overall, the patients in the high-intensity aerobic exercise group experienced improved cognitive function compared with those in the control group. These effects were more pronounced in women than in men, despite similar increases in fitness. The sex differences may be related to the metabolic effects of exercise, as changes to the body's use and production of insulin, glucose and the stress hormone cortisol differed in men and women.

"Aerobic exercise is a cost-effective practice that is associated with numerous physical benefits. The results of this study suggest that exercise also provides a cognitive benefit for some adults with mild cognitive impairment," the authors conclude. "Six months of a behavioral intervention involving regular intervals of increased heart rate was sufficient to improve cognitive performance for an at-risk group without the cost and adverse effects associated with most pharmaceutical therapies."

In another report, Yonas E. Geda, M.D., M.Sc., and colleagues at Mayo Clinic, Rochester, Minn., studied 1,324 individuals without dementia who were part of the Mayo Clinic Study of Aging. Participants completed a physical exercise questionnaire between 2006 and 2008. They were then assessed by an expert consensus panel, who classified each as having normal cognition or mild cognitive impairment.

A total of 198 participants (median or midpoint age, 83 years) were determined to have mild cognitive impairment and 1,126 (median age 80) had normal cognition. Those who reported performing moderate exercise—such as brisk walking, aerobics, yoga, strength training or swimming—during midlife or late life were less likely to have mild cognitive impairment. Midlife moderate exercise was associated with 39

percent reduction in the odds of developing the condition, and moderate exercise in late life was associated with a 32 percent reduction. The findings were consistent among men and women.

Light exercise (such as bowling, slow dancing or golfing with a cart) or vigorous exercise (including jogging, skiing and racquetball) were not independently associated with reduced risk for mild cognitive impairment.

Physical exercise may protect against mild cognitive impairment via the production of nerve-protecting compounds, greater blood flow to the brain, improved development and survival of neurons and the decreased risk of heart and blood vessel diseases, the authors note. "A second possibility is that physical exercise may be a marker for a healthy lifestyle," they write. "A subject who engages in regular physical exercise may also show the same type of discipline in dietary habits, accident prevention, adherence to preventive intervention, compliance with medical care and similar health-promoting behaviors."

Future study is needed to confirm whether exercise is associated with the decreased risk of mild cognitive impairment and provide additional information on cause and effect relationships, they conclude.

More information: Arch Neurol. 2010;67[1]:71-79, 80-86

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