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Study: Exercise Can Protect People at High Risk of Alzheimer's

Posted by ALICE PARK Tuesday, September 7, 2010 at 7:26 pm

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ADRIAN DENNIS

Staying active is good for the body, and the latest research shows it might benefit the mind as well.

In a study of individuals who carried a high-risk gene for Alzheimer's disease, researchers found that those who exercised showed greater brain activity in memory-related regions than those who were sedentary. That additional burst of industry may help to protect them against cognitive decline.

The findings provide stronger support for the idea that lifestyle behaviors may be effective in warding off Alzheimer's, at least for those at highest risk for the disease. So far, however, the **evidence remains unclear** on whether a similar protective effect exists for individuals at lower risk for the neurological condition.

Researchers led by Stephen Rao, director of the Schey Center for Cognitive Neuroimaging at the Cleveland Clinic, report in the journal *NeuroImage* that physical activity helps the brains of at-risk individuals build up a neural reserve of "hyper-function" that may hold off dementia and neurological decline.

People who inherit a certain version of the ApoE gene, which regulates triglyceride metabolism, are at higher risk of developing Alzheimer's — as much as a quarter of early onset cases may be due to this genetic variation. Previous studies have found that even among those with the riskier version of the gene, exercise could slow the first appearance of cognitive decline, and Rao wanted to know how. Was it the endorphins and other feel-

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good byproducts of exertion that were providing a temporary boost in intellectual operations of the brain? Or was exercise providing some more fundamental benefit specific to neurons in memory-related areas?

He got his answer in the current study by comparing the brain activity of both high- and low-risk individuals ages 65 to 85 while they performed a memory task. He subdivided these volunteers by whether they engaged in a low level of physical activity (two or fewer days a week of low intensity exercise) or more intensive exercise (walking briskly, jogging, swimming or playing tennis at moderate to vigorous intensity three or more days a week).

For the memory task, Rao provided volunteers with a series of easily recognizable famous names (such as Frank Sinatra and Britney Spears) and non-famous monikers taken from a phone book. Using functional magnetic resonance imaging (fMRI), he watched how their brains processed each of the names. He and his team recorded the most intense brain activity among the high-risk individuals who reported exercising the most.

Since earlier work had linked such intense activity with a better cognitive outcome, he speculates that exercise may be a way to help those at high risk of developing Alzheimer's to slow down the damaging effects of their disorder. "We were able to show that the changes in the brain, and the better outcomes cognitively in people at risk of Alzheimer's disease, are actually related to changes that are going on in the memory system within in the brain," Rao says. "And these memory systems are the areas in the brain most vulnerable to pathology, at least in the early stages of Alzheimer's disease."

The heightened brain activity, he says, is the brain's way of compensating for the beginning stages of deteriorating nerve function. And the more activity there is, the more likely the individual will be able to protect himself from the outward signs of memory loss and cognitive decline. "We believe physical activity helps to enhance the cognitive reserve of the brain, by enabling the brain to work harder and allow people to stay at a higher level of function for a longer period of time," he says.

Rao is planning to prove that in a more definitive way with his next trial, in which he will recruit individuals with the diseased ApoE gene who are relatively inactive and put them on an exercise program to track changes in their memory and cognitive functions.

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