

Aerobic Exercise Improves Cognition In Old Age

Written by Ana Sandoiu

A significant number of people aged 65 and over are affected by mild cognitive impairment. New research suggests aerobic exercise can have remarkably beneficial effects on these patients. Mild cognitive impairment (MCI) refers to the slightly decreased cognitive abilities in individuals of 65 years of age and over. Such people may experience minor cognitive decline in memory or reasoning, but not to an extent where it interferes significantly with daily activities. Studies report that anywhere between **5-20 percent** of the older population have MCI. MCI often leads to **Alzheimer's disease** (AD). Some **studies** have shown that 80 percent of patients with MCI have developed AD after 6 years. Previous **research** has suggested exercise training may increase the volume of some brain areas and improve memory. Now, new research confirms it may not only increase brain size, but could also improve cognition in patients with MCI.

Studying the effects of exercise on patients with MCI

Researchers examined 35 adults with MCI in a randomized, controlled trial of physical exercise. The team was led by Laura D. Baker, Ph.D., from Wake Forest School of Medicine (WFSM) in Winston-Salem, NC. Researchers divided the participants in two groups: one group of 16 adults averaging 63 years of age, and a control group of 19 adults with the mean age of 67. The former group participated in a range of aerobic activities, including treadmill, stationary bike, and elliptical training. They trained four times per week for 6 months. The control group engaged in stretching exercises at the same rate. Scientists took magnetic resonance scans of all of the participants' brains before and after the 6-month period. The brain images were compared using conventional and biomechanical metrics to measure the changes in brain volume and shape. "We used high-resolution MR [magnetic resonance] images to measure anatomical changes within areas of the brain to obtain both volumetric data and directional information," says co-author Jeongchul Kim, Ph.D., of WFSM.

Executive function improved with aerobic activity

At the end of the 6-month period, participants were tested to see the effects of aerobic exercise on cognitive function. "Even over a short period of time, we saw aerobic exercise lead to a remarkable change in the brain," says Baker.

Those who took part in the aerobic program had improved significantly more in executive function than the stretching group.

In both the aerobic and the control group, researchers noticed a volume increase in most gray matter areas of the brain, including the temporal lobe, which is responsible for short-term memory.

"Compared with the stretching group, the aerobic activity group had greater preservation of total brain volume, increased local gray matter volume, and increased directional stretch of brain tissue," adds Kim.

In the stretching group, researchers noticed a local atrophy within the white matter tracts, also known as connecting fibers. Kim notes that such a deformation is most of the time related to brain volume loss, but not always. Kim explains that the treatment of AD and MCI requires

tracking changes in the brain while patients undergo changes in diet and exercise. Therefore, both MRI measures are important to the treatment of these conditions. "Any type of exercise can be beneficial," he adds. "If possible, aerobic activity may create potential benefits for higher cognitive functioning."

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