Aerobic fitness and hormones predict recognition memory in young adults

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Researchers at Boston University School of Medicine (BUSM) have found further evidence that exercise may be beneficial for brain health and cognition. The findings, which are currently available online in *Behavioural Brain Research*, suggest that certain hormones, which are increased during exercise, may help improve memory.

Hormones called growth factors are thought to mediate the relationship between exercise and brain health. The hippocampus, a region of the brain crucial for learning and memory, is thought to be uniquely affected by these hormones.

The growth factors brain-derived neurotrophic factor (BDNF), vascular endothelial growth factor (VEGF), and insulin-like growth factor-1 (IGF-1), have been implicated in the link between exercise and hippocampal function. BDNF, for example, acts on the nervous system to help regulate communication between existing brain cells (neurons) and stimulate the growth and maturation of new hippocampal neurons and blood vessels.

In this study, the researchers recruited healthy young adults, in whom they measured blood hormone levels together with performance on a recognition memory task and aerobic fitness. The researchers were thus able to correlate the blood hormone levels with aerobic fitness, and subsequently whether there was any effect on memory function.

According to the researchers, BDNF and aerobic fitness predicted

memory in an interactive manner, suggesting that at low fitness BDNF levels negatively predicted expected memory accuracy. Conversely, at high fitness resting BDNF levels positively predicted recognition memory. There also was a strong association between IGF-1 and aerobic fitness; however there was no complementary link between IGF-1 and memory function.

"We will be continuing this line of research by testing if memory improves following an exercise training program in both young and geriatric adults, and by adding brain imaging techniques," explained Karin Schon, PhD, assistant professor of anatomy and neurobiology at BUSM, who served as the study's principal investigator.

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