Title: “How fasting and exercise are good for your brain”

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You're listening to Brain Talk from the Johns Hopkins Brain Science Institute.

Dr. Mattson: “The amount and frequency of meals in our modern life is abnormal from the perspective of our evolutionary history. Our ancestors did not eat three meals a day plus snacks they had to often times, scrounge for food...”

Dale: Dr. Mark Mattson is a professor of neuroscience at Johns Hopkins University School of Medicine and Chief of the Laboratory of Neurosciences at the National Institute on Aging. Dr. Mattson and his team are studying the brains of mice that eat supersized fast food diets.

Today on Brain Talk: how fasting and exercise is good for your brain and your health.

Dr. Mattson’s research shows that for humans, eating three meals a day is not natural.”

Dr. Mattson: “Genetically, from an evolutionary standpoint, we’re geared to eating more intermittently, for example, eating one day versus 3 meals a day plus snacks. The normal feeding conditions for all laboratory animals is they have constant access to food, so our control lab animals are kind of like typical American where we can eat whenever we want. So we find when we take these all American rats or mice and subject them to intermittent fasting diets, it’s really good for their brain, particularly as they age it protects them from, for example, age related cognitive decline.”

Dale: “Dr. Mattson and his team have found that intermittent fasting works, because it produces a mild energetic stress that’s good for brain cells.”

Dr. Mattson: “Conversely we find that intermittent fasting, it’s a different type of energetic stress on your nerve cells in fact they become more active, so, at least in animals and we think also in humans, when you’re hungry and you haven’t eaten in a long time your nerve cells are more active and that makes sense from an evolutionary standpoint because say if you’re an animal in the wild and you haven’t found food for a while, you better keep your brain cells active so that you can figure out how to find food.”

Dale: “And what works in combination with intermittent fasting, is exercising – expending physical energy.”

Dr. Mattson: “And of course often to find food you have to expend energy if you are trying, for example, catch prey and eat it after you catch it. So there seems to be during evolution a kind of co-evolution of your cognitive ability to find where food is and then your physical ability to acquire the food.”
Dale: “Our sedentary culture and the easy availability of food means obesity and diabetes are on the rise. These are risk factors for heart disease and some cancers. But it’s only recently that researchers have learned obesity and diabetes are bad for the brain.”

Dr. Mattson: “In our lab we found interestingly that obesity and diabetes have the opposite effect that exercise and intermittent fasting do on the brain in that obesity and diabetes will impair the ability of nerve cells to cope with stress.”

Dale: “This means brain cells are less able to protect themselves against aging and disease.”

Dr. Mattson: “There have been studies in humans for example doing brain imaging that have shown that obese individuals, the actual size of a brain region called the hippo campus, which is critical for learning and memory, decreases.”

Dale: “Dr. Mattson explains, however, that if people who are overweight can do intermittent fasting and exercise, they can improve both the health of their body and their brain. So learning to live and eat somewhat like a cave man can help.

For more information on how nutrition can affect your brain power, go to brainscienceinstitute.org. I’m Dale Connelly, and this is Brain Talk from Johns Hopkins University.”

Additional Information:

Read "Energy Intake and Exercise as Determinants of Brain Health and Vulnerability to Injury and Disease" and article on Sciencedirect.com

NIH’s National Institute on Aging: Cellular and Molecular Neurosciences Section

http://www.brainscienceinstitute.org