

Severe diet linked to physical fitness into old age

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Severely restricting calories leads to a longer life, scientists have proved.

New research now has shown for the first time that such a diet also can maintain physical fitness into advanced age, slowing the seemingly inevitable progression to physical disability and loss of independence.

The study, using a rat model of lifetime caloric restriction, showed that the diet reduces the amount of visceral fat, which expresses inflammatory factors that in humans cause chronic disease and a decline in physical performance and vitality across the lifespan.

The study appeared in a recent issue of *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*.

Have we finally discovered the Fountain of Youth?

No. But we may be getting a little closer.

"This is the first study to report that caloric restriction reduced production in visceral fat of the inflammatory cytokine IL-6 and enhanced performance on overall physical function assessments," said Tongjian You, assistant professor of exercise and nutrition sciences in the School of Public Health and Health Professions and principal investigator.

"In addition, rats that ate a normal diet lost a significant amount of lean muscle mass and acquired more fat, while calorie-restricted rats maintained lean muscle mass as they aged."

The study was conducted with male rats in three age groups—18, 24 and 29 months, comparable to ages 50-70 years in humans—that had been fed either a normal or 40-percent, calorie-restricted diet from birth. The animals were put through tests to determine grip strength, muscle tone, stamina and swimming speed.

Data also were collected on whole body mass, lean body mass, fat mass, percent body fat, the ratio of fat-to-lean body mass, amount of visceral fat and the amount of pro-inflammatory cytokines and C-reactive protein, a marker of chronic inflammation.

Results showed that animals on the restricted-calorie diet had significantly higher physical performance scores than animals fed a normal diet. They also had less fat, a lower fat-to-lean ratio and lower adipose tissue secretion of IL-6 and circulating levels of C-reactive protein.

The stumbling block on this path to remaining forever young is that humans could not adhere to such a severe diet.

"Based on an average of 2,000 calories per day for adult women and 2,500 for men, cutting by 40 percent would mean surviving on 1,200 and 1,500 calories per day, respectively, said You.

"It's very difficult for people to maintain that type of diet for short periods of time, and it would be nearly impossible over a lifetime, while staying healthy. Starting on a diet like that in the senior years would be harmful."

You said that a more moderate form of caloric restriction, 8 percent, is achievable in

humans, based on recent findings, and may have positive effects on specific oxidative stress and inflammatory biomarkers.

"Preclinical testing of this 8-percent regimen could be informative and beneficial in translating to humans," he said.

Researchers on the study, in addition to You, were William E. Sonntag and Xiaoyan Leng from Wake Forest University School of Medicine and Christy S. Carter from the University of Florida and the Malcom Randall VA Medical Center in Gainesville.

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