Study Furthers Understanding of Age-Related Muscle Loss

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A new study, published online June 20 in the free journal *Immunity & Aging*, contributes to our understanding of why muscle breaks down as we get older and offers hints about how and when to use drugs such as testosterone in older age, including in those living with HIV.

One of the hallmarks of aging is the loss of muscle mass. This doesn't just change a person's physique, it also contributes to fragility and increases the likelihood that a person will fall—and that such falls will result in more serious injuries.

In the earlier days of the epidemic, when wasting syndrome affected a majority of people with advanced HIV disease, numerous strategies were employed to reverse the course of muscle loss. These included testosterone, anabolic steroids and human growth hormone.

Wasting disease has become far less common in recent years, but as people with HIV grow older there has been a resurgence of interest in how to spare people from age-related muscle loss.

One of the interventions being explored to prevent or reverse age-related muscle loss is testosterone. Given testosterone's potential for serious side effects, however, other alternatives are being sought, and researchers are also looking for ways to figure out who might benefit most from such therapy.

In the hope of contributing new insights into age-related muscle wasting, Camellia Banerjee, MD, from the Boston University School of Medicine, and her colleagues looked at a series of human proteins associated with muscle building and immune function in older and younger HIV-negative men who had received an experimental course of testosterone. Levels of these proteins had been previously shown in other research to decline with age.

Banerjee's team specifically wanted to know which proteins were associated with the addition of muscle mass during two different doses of testosterone therapy and whether the protein levels differed between the 60 younger men (ages 18 to 35) in the study and 61 older men (ages 60 to 75).

Despite the fact that both younger and older men saw increases in muscle mass with the use of 300 milligrams (mg) testosterone per week, Banerjee and her colleagues found that only certain

proteins were associated with greater muscle gains in those taking the hormone. In younger men, insulin-like growth factor (IGF1), N-terminal propeptide of type III collagen (PIIINP), and the appetite suppressing hormone leptin were all associated with greater muscle gains in those using testosterone. In older men, only leptin levels were predictive of muscle gains in those using testosterone.

The relevance of this finding is that there may be differences in how testosterone promotes muscle growth in older people. Understanding these differences, say the authors, could result in new and different therapies that will be better suited to people with age-related muscle wasting. Also, though the study did not include HIV-positive men, it could lead to better studies in people with HIV who are experiencing muscle loss.
