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Research article

Age-Related, Site-Specific Muscle Loss in 1507 Japanese Men and Women Aged 20 to 95 Years

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ABSTRACT

We investigated the relationship between age and muscle size in both the appendicular and trunk regions of 1507 Japanese men and women aged 20 to 95 years. Seven hundred twenty-two men (young [aged 20-39 years], n = 211; middle-aged [aged 40-59 years], n = 347; and old [aged 6095 years], n = 164) and 785 women (young, n = 207; middle-aged, n = 341; and old, n = 237) were recruited for this cross-sectional study. Muscle thickness (MTH) and subcutaneous fat thickness (FTH) were measured by ultrasound at 8 sites on the anterior and posterior aspects of the body. MTH was expressed in terms relative to limb length (MTH/L) or height (MTH/Ht). Percent body fat was estimated from FTH, and fat-free mass (FFM) was calculated. In men, a graded decrease in FFM was found in all age groups. In women, FFM was similar in the young and middle-aged groups, but was lower in the oldest group. Age was significantly and inversely correlated with FFM in men ($r = -0.358$, $p < 0.01$), but not in women ($r = -0.08$). On the other hand, age was strongly and inversely correlated with quadriceps MTH/L (men, $r = -0.529$; women, $r = -0.489$; both $p < 0.001$) and abdomen MTH/Ht (men, $r = -0.464$; women, $r = -0.446$; both $p < 0.001$) in both men and women, while there were only weak correlations between age and other lower limb and trunk sites. Our results indicated that sarcopenia is observed as a site-specific loss of skeletal muscle mass, especially for the quadriceps and abdominal muscles, in Japanese men and women aged 20 to 95 years.

Key words: Sarcopenia, muscle distribution, daily physical activity

Key Points

- It is not fully understood whether age-related changes in muscle size differ between the appendicular and trunk muscles and/or between muscle groups located in the anterior and posterior aspects of the body in a large population.
- Age-related muscle loss is observed as a site-specific, especially of the quadriceps and abdominal muscles, in Japanese men and women aged 20 to 95 years.
- The age-related muscle losses are not supported by the muscle activation pattern of normal daily activities evaluated by EMG activity.