

Preliminary Analysis of Male and Female Size Differences of the Achilles Tendon in Active Aging Adults

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ABSTRACT

Achilles tendinopathy impacts athletes of all ages. The Achilles tendon plays a key role in most athletic movements and is vital in the gait cycle. The prevalence of Achilles tendinopathy is associated with increasing age, which causes problems with gait and decreases quality of life. **PURPOSE:** We investigated factors associated with differences in Achilles size — cross sectional area (CSA) and thickness — in active maturing adults. **METHODS:** Participants were chosen from volunteers competing in the Huntsman World Senior Games in St. George, UT, October 2021. Participants rested prone on a treatment table with the ankle in a neutral position. A strap connected to the end of the table was placed around each foot to create a 90-degree angle at the ankle. Ultrasound (US) transmission gel was applied to the head of the probe to collect transverse and longitudinal images using a ML 6-15 Probe. The midportion of the Achilles tendon CSA was measured at the intersection of a line between the medial and lateral malleoli. The probe was then rotated 90 at this point to capture thickness measurements. Random selection of 20 males (age=68.050, weight=181.780 lbs., height=67.925 in., body fat=13.875%) and 20 females (age=63.391, weight=147.409 lbs., height=65.543 in., body fat=33.500%) were chosen from a larger data set and analyzed by a single researcher in this preliminary study. **RESULTS:** There was a significant difference between the CSA of males and females ($p=0.046$), with an average of 0.747 cm^2 and 0.565 cm^2 respectively. Achilles thickness also had a significant difference when comparing males and females ($p=0.029$), with an average of 0.601 cm and 0.491 cm respectively. Weight, body fat, and age were significant independent variables for both CSA and thickness. There was not a significant relationship between left and right Achilles tendons ($p \geq 0.23$). Large effect sizes (1.07 and 0.97) were found for CSA and thickness between groups indicative of a meaningful clinical difference. **CONCLUSION:** Males and females have a quantifiable size difference of the midportion of the Achilles tendon in an active older adult population. These values are important for interpreting images within this population and may also be important in determining pathologic tendons.