

Aging Male Runners Show Achilles Tendon Thinning Following a 10k Run While Females Do Not - Pilot Analysis

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Category: Masters

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ABSTRACT

The Achilles tendon experiences large amounts of force while running, which leads to Achilles tendon adaptation. One known Achilles tendon adaptation to running is Achilles tendon thinning. The Achilles tendon thinning response has not been examined at multiple locations of the Achilles tendon and has not been studied in an aging (>50 y) population. **PURPOSE:** We examined the effect of a 10k run on Achilles tendon cross sectional area in three locations of the Achilles tendon in runners aged 50 years and older. **METHODS:** Seven runners - three male (age = 73.6 y \pm 8.2, height = 174.4 cm \pm 2.9, weight = 69.0 kg \pm 5.3) and four female (age = 58.3 y \pm 4.8, height = 165.4 cm \pm 5.1, weight = 55.3 kg \pm 3.5) participated in this study. Runners were ages 53+, free from injury and running in the Huntsman Senior Games 10k race. Prior to the run, participants were marked at three locations along the Achilles tendon. The first marked location was directly between the apex of the medial and lateral malleoli (malleolar line). The next marked location was 50% of the distance from the malleolar line to the most posterosuperior aspect of the calcaneus. The third location was the same distance as the second mark, but superior from the malleolar line. With the ankle at 90 degrees, the Achilles was imaged at each of these locations using ultrasound imaging. Runners ran the 10k race and, immediately following, were imaged again in the three previously marked locations. **RESULTS:** Males experienced significant thinning at two of the three measured locations along the Achilles tendon - at the malleolar line ($p=0.005$) and nearest the soleus ($p=0.013$). Males experienced a disproportionate amount of thinning at the malleolar line when compared with the measurements nearest the calcaneus ($p=0.007$) and nearest the soleus ($p=0.042$). However, females experienced no statistically significant Achilles tendon thinning at any measured location ($p<0.05$). Age and weight were significant variables in the analysis ($p<0.05$). **CONCLUSION:** Aging males appear to have an Achilles tendon thinning response similar to that of a young adult population, as reported in previous research, while aging females do not (Sponbeck et al., 2021). These findings may hold important implications about Achilles tendon fluid movement, tendon nutrition, and tendinopathy in males and females.