

Response to: A few considerations on “Achilles and patellar tendinopathy display opposite changes in elastic properties.”

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We thank Wu (2017) and the editors for the opportunity to provide greater discussion on the association of tendon shear wave velocity (SWV) with potentially important covariates including sex and age. We would like to first clarify that we did not directly compare the Achilles and patellar tendinopathy groups. Instead, the (most) affected tendon from each tendinopathy group was compared with a matched tendon from the healthy control group. Due to the blinded nature of this study, we sought to include a broad cohort of healthy control participants and performed statistical adjustment for age, sex, body mass index and tendon thickness in all models.

Although not without limitation, we consider this approach provides some meaningful information in response to the comments raised in this letter to the editor.

Wu (2017) postulates that the lower male to female proportion might explain the higher SWV for patellar tendinopathy compared to healthy controls. Evidence of differences in tendon mechanical properties between sexes is reported in some (Kubo et al. 2003), but not all studies (O'Brien et al. 2010), derived from measurement of force and deformation during maximal contraction. Heterogeneity is also found between studies using shear wave elastography (Aubry et al. 2013, Tas et al. 2017). In our sample, no male-female differences in SWV were observed at any tendon region, suggesting it did not have a large impact on our conclusions.

Wu (2017) also postulates that age discrepancy between groups may explain the opposing changes in elastic properties between Achilles and patellar tendinopathy. While we did not find a significant correlation between age and SWV for any tendon region in our healthy control participants, we cannot discount the possibility of type 2 error, given the sample size and age range of our healthy group was smaller than

previous studies, which report significant age-related reductions in SWV for the Achilles (Aubry et al. 2013) and patellar tendons (Hsiao et al. 2015). Using a multivariate model to test for differences between Achilles tendinopathy and healthy participants, we identified that both age and tendinopathy were independent predictors of SWV of the Achilles insertion. Reduction in SWV was most pronounced in older adults with Achilles tendinopathy. The multivariate model for the proximal patellar tendon identified tendinopathy as the only predictor of SWV.

We acknowledge there is potential for sample bias, as patellar tendinopathy phenotypically affects young individuals (Zwerver et al. 2011) and Achilles tendinopathy is most common in middle aged individuals (Scott et al. 2013). We concur with Wu (2017) that further research including sex and age matched healthy controls is needed to provide more solid evidence that Achilles and patellar tendinopathy display opposing trends in tendon elastic properties.

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