
PRETIBIAL STRENGTH AND GAIT CHARACTERISTICS IN INDIVIDUALS WITH UNILATERAL PLANTAR FASCIITIS VERSUS HEALTHY CONTROLS

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Background: While higher ground reaction forces (GRF) have been a suspected cause of plantar fasciitis (PF), its relationship is still unclear. Muscle fatigue is known to cause higher GRFs, but no known studies have examined the relationship between pretibial strength and PF.

Purpose: The purpose of this study is to compare pretibial strength and specific gait characteristics in those with unilateral PF with gender-matched healthy participants.

Study Design: Case-control Study.

Methods: Twenty participants with unilateral PF (mean age 47 years, 13 females) were compared between involved and uninvolved feet as well as with twenty gender-matched healthy controls (mean age 43 years, 13 females). A hand-held dynamometer was used to measure the strength of tibialis anterior (TA) and extensor hallucis longus (EHL). A pressure treadmill was utilized to quantify gait parameters such as initial toe contact and max GRF.

Results: Some evidence demonstrated EHL strength to be weakened in involved feet of the PF group when compared to healthy controls (0.07 kg (0.02) vs 0.08 kg (0.03), $P=0.11$, $\eta^2=0.4$). As well, the involved side of the PF group exhibited some evidence of early toe initial contact versus healthy controls (34.6% gait cycle (10.6) vs 38.8% gait cycle (13.3), $P=0.14$, $\eta^2=0.4$). Mean max GRF was also found to be significantly higher in the PF group versus healthy controls (involved versus controls, 780.4 N (98.6) vs 700.2 N (126.9) $P=0.02$, $\eta^2=0.7$; uninvolved vs controls, 789.8 N (100.0) vs 692.7 N (126.0) $P=0.01$, $\eta^2=0.9$).

Discussion/Conclusion: While no significant differences were noted with TA strength between groups, some evidence for a weak EHL coinciding with early initial toe contact during gait may exist in those with PF. This study is relevant as it possibly identifies a muscle group needing to be strengthened when treating PF.

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