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ORIGINAL RESEARCH

PREDICTING FOOT PROGRESSION ANGLE DURING GAIT USING TWO CLINICAL MEASURES IN HEALTHY ADULTS, A PRELIMINARY STUDY

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ABSTRACT

Background: The foot progression angle (FPA) is related to the transverse plane rotation of the lower extremities and associated with many lower extremity conditions.

Purpose: The purpose of this study was to examine how two commonly used clinical measures, tibio-fibular torsion (TF) and hip rotation, can be used to predict FPA during gait in healthy adults.

Study Design: Cross-sectional study design

Methods: Passive hip internal and external rotation ranges of motion and TF torsion were measured with a 12-inch goniometer while the FPA (degree of toe-in/out) was measured with the GAITRite during mid-stance in sixty participants. The data was analyzed using a multiple regression model.

Results: Hip ER was not significant and was therefore excluded from the final model. The final model included passive hip IR and TF torsion ($F = 19.64$; $p < .001$; multiple $R^2 = .41$; adjusted $R^2 = .39$). Simple binary correlations showed that hip IR had a moderate negative correlation ($r = -.40$) with FPA (the greater the hip IR, the greater the in-toeing) while TF torsion had a positive correlation ($r = .39$) with FPA (the greater the external TF torsion. the greater the out-toeing).

Conclusions: Greater amount of passive hip IR predicts in-toeing while greater TF torsion predicts out-toeing of the foot during midstance phase of gait.

Level of Evidence: Level 2

Keywords: hip rotation, TF torsion, and foot progression angle

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