ORAL PRESENTATIONS
OP10

Variation in Spatiotemporal Parameters of Gait between Transtibial and Transfemoral Amputees in Physical Rehabilitation: A Preliminary Study

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ABSTRACT

Background: Lower limb amputees often exhibit less efficient gait patterns, potentially attributed to spatiotemporal asymmetries. While there is a common belief that transfemoral (TF) amputees experience more pronounced gait asymmetries compared to transtibial (TT) amputees, this assumption lacks clear and definitive establishment through empirical evidence. **Objectives:** The objective of this study was to compare the effects of amputation level on the step width, step length, cadence, step time, and walking speed for prosthetic and intact legs. In addition, a degree of asymmetry (DoA) was calculated and tested for each of these five parameters. **Methods:** Twenty-two (22) participants with transfemoral (11) and transtibial (11) amputation (45.5 ± 12.18 years) participated in the cross-sectional study design. Subjects were tested on 10-meter walkways 10 times at their habitual walking speed and the average of three trails was calculated. Spatiotemporal gait parameters were assessed using Vicon Motion Capture, UK. **Results:** Prosthetic and intact limbs were averaged together. The step length ($p = 0.596$), step width ($p = 0.618$), and walking speed ($p = 0.721$) were not statistically significantly different between the TF and TT group, $p = > 0.05$ whereas the cadence ($p = 0.011$) and step time ($p = 0.033$) were statistically significant $p = < 0.05$. The DoA analysis indicated that TF amputee step times were more asymmetrical than TT amputees (DoA = 0.20 ± 0.07 vs. 0.05 ± 0.05, $p = < 0.001$). **Conclusion:** TT amputees walk with greater cadence and step time compared to TF amputees as well as DoA. The spatiotemporal performance among transfemoral amputees should be improved to restore a nearly physiological pattern of movement.

Keywords: Transfemoral amputees; Transtibial amputees; Gait Parameter; Spatiotemporal; Prosthesis

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