Abstract

Background: Lower limb amputees exhibit postural control deficits during standing which can affect their walking ability. Objectives: The primary purpose of the present study was to analyze the thorax, pelvis, and hip kinematics and the hip internal moment in the frontal plane during gait in subjects with Unilateral Transtibial Amputation (UTA). Method: The participants included 25 people with UTA and 25 non-amputees as control subjects. Gait analysis was performed using the Vicon ® Motion System. We analyzed the motion of the thorax, pelvis, and hip (kinematics) as well as the hip internal moment in the frontal plane. Results: The second peak of the hip abductor moment was significantly lower on the prosthetic side than on the sound side (p=.01) and the control side (right: p=.01; left: p=.01). During middle stance, the opposite side of the pelvis was higher on the prosthetic side compared to the control side (right: p=.01; left: p=.01). Conclusions: The joint internal moment at the hip in the frontal plane was lower on the prosthetic side than on the sound side or the control side. Thorax and pelvis kinematics were altered during the stance phase on the prosthetic side, presumably because there are mechanisms which affect postural control during walking.

Keywords

Keywords, unilateral transtibial amputation, physical therapy, joint moments, frontal plane, kinematics, pelvis motion.