Abstract

Knee Osteoarthritis (OA) is one of the most prevalent form of arthritis, especially in the elderly. Individuals with knee OA experience pain, joint stiffness and swelling, joint deformity and muscles atrophy. The symptoms with knee OA were limited activities of daily living such as walking ability, climbing up or down stairs, rising from a chair and stepping over obstacles. Previous biomechanical studies of knee OA focused on level walking, chair rising, and stairs climbing. However, there were little studies regarding about the motion characteristics of knee OA patients during stepping over obstacles. Therefore, the purpose of this study is to evaluate the gait characteristics during stepping over obstacles. Vicon motion analysis system and two AMTI force plates were used to collect the movement data of lower limbs and ground reaction forces and moments during level walking and stepping over obstacles. Twelve normal elderly females and twelve female patients with knee OA were recruited in this study. There were significant differences in the joint range of motion (ROM) of knee and, hip and knee joint moments during level walking between OA group and normal group. Also, comparing with normal subjects, greater ROM of hip abduction and step width, less step length, less heel-to-obstacle distance, and slower crossing speed were found in the patients with knee OA. The hip and knee joint moments on the affected side were less than that of the sound side in the patients with knee OA. These findings of biomechanical characteristics of knee OA patients during stepping over obstacles could be the additional guidelines for the clinical diagnosis and treatment.