

THE EFFECT OF IMPACT ABSORPTION DEVICE IN HIGH HEELED SHOES DURING WALKING

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KEY WORDS: high heeled shoes, impact, absorb, device.

INTRODUCTION: With fashion being an important aspect for most young women experience higher stress on their feet while walking in high heeled shoes. Amit Gefen (2002) reported that the medio-lateral (M/L) stability of the foot could be quantified by measuring the M/L deviations of the center of pressure (COP). Amit also stated that fatigue of lower-limb muscles was observed by EMG with the reduction of stability. The purpose of this study was to research if an impact absorbing device could effect the stability and impact performance of high heeled shoes.

METHOD: Ten female participated in this study (mass 53.9 ± 5.4 kg , age 25 ± 1 yrs and height 166.7 ± 3.2 cm). Two different shoes were used in this study. The first was a prototype high heeled shoe (P2) with an impact absorbing device in the heel. The second was a high heeled shoe without the impact absorbing device (P1). Kinetic data were collected with a AMTI platform sampled at 500Hz and Novel pedar-X plantar pressure measurement sampling at 50Hz. At the same time, electromyography(EMG) signals were collected for the tibialis anterior and gastrocnemius muscles. Kinematic data were collected with a high speed camera (DFK-HC 1000).

RESULTS & DISCUSSION: The two high heeled shoes were from the same manufacturer, of the same material and style and had the same heel height. There were no significant differences in kinetic variability. But there was a little difference in vertical force and contact time. There was no significant difference in rear foot angle. Joanne (1996) reported that stance duration was essentially unchanged by heel height. The P1 shoes had a higher max pressure than P2 for the heel (M1), but was less on the fore foot (M2). EMG data needs to be analyzed to compare the muscles activity.



CONCLUSION : Based on the kinematic and kinetic data, we concluded that there is no difference in biomechanical variability. Participants said that the new prototype (P2) was more comfortable than normal shoes, although there was a just difference shock absorbing material in the high heel. After analysis of EMG data, the correlation between EMG date and fatigue will be researched.

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