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The effect of protective socks with functional insoles on plantar foot pressure in patients with diabetes

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Background: Present trends indicate that more than 60% of the world's diabetic population will eventually be Asian. In many Asian countries, it is customary to remove outdoor shoes before entering a house. Socks are the first line of defense of the diabetic foot and socks are considered to an important and modifiable risk factor for foot ulceration in Asians. Previous studies found that socks reduced plantar pressure in patients with rheumatoid foot and diabetic neuropathy.

Purpose: Although previous studies evaluated padded or multilayered socks, no protective sock combined with an insole is yet available to effectively reduce plantar pressure both indoors and outdoors. Here, we investigated whether experimental socks with functional insoles (SFI) reduced plantar pressure in diabetics while walking.

Methods: We enrolled 17 diabetic patients. As in shoe measurement device was used to measure the peak plantar pressure while walking. Peak plantar pressure data were collected during gait under three conditions: (1) wearing one's own socks, (2) wearing diabetic socks (Softsock; Silipos, Niagara Falls, NY, USA) and (3) wearing the SFI. Repeated measures ANOVA were used to compare the peak plantar pressures under the three conditions in three plantar areas.

Results: The SFI significantly reduced the peak plantar pressure of the lateral hind-foot, but significantly increased the peak plantar pressure of the medial and middle forefoot and of the mid-foot (all $p<0.05$).

Conclusions: The SFI reduced plantar pressure in the hind-foot and supported the medial longitudinal arch. However, it is necessary to change the insole design and material in the forefoot area to prevent diabetic foot ulceration.

Biography

D Y Jung is a Professor in the Department of Physical Therapy at the Joongbu University. He has received his BS, MSc and PhD degree in Physical Therapy from Yonsei University in 1999, 2003 and 2010, respectively. He is interested in the mechanisms of movement impairment, movement analysis and prevention and management of the work related musculoskeletal pain syndrome. Also, he is specialist for managing in people with foot problem caused by excessive stress during weight bearing activities. More recently, he also have been investigating foot disability in people with diabetes, especially the injury (ulcer) and heeling on the feet of people with diabetes mellitus and peripheral neuropathy with a primary goal to reduce the incidence of skin break down and lower extremity amputations in this high risk population.

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