Service Priorities and Programmes

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Submitting author: Mr Yat Chau Sam LAW
Post title: Prosthetist-Orthotist I, Queen Elizabeth Hospital, KCC

Footwear Fit Screening Pilot Program - Characteristics of Footwear for People with Forefoot Pain

Yip HSF1, Wong KF3, Man SW1, Lam WT2, Law SYC2
1 Department of Orthopaedic& Traumatology, Queen Elizabeth Hospital 2 Department of Prosthetic & Orthotics, Queen Elizabeth Hospital, 3 Department of Prosthetic & Orthotics, Kowloon Hospital,

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Introduction

Incorrectly footwear fitting is strongly associated with forefoot deformity and pain. Abrasion injury may be resulted for diabetic patients with neuropathic foot. A pilot project to explore the feasibility of 3-dimentional footwear fit objective evaluation has been launched in the Queen Elizabeth Hospital.

Objectives

To investigate the footwear fit for subjects with forefoot pain

Methodology

Subjects with forefoot pain and those with no history of foot pain were recruited from June-August 2013. Subjects' feet were scanned, using hand-held laser scanner (M4D, Rodin 4D, France), under two standing postures, i.e. bipedal standing and simulated toe-off posture. Shoe last of subject's most common wearing shoes are copied by filling plaster into the shoes. Plaster shoe lasts were taken off and digitized using laser scanner. The above method is used for healthy subjects as control. Comparisons between barefoot and that of shoe last, in longitudinal length, and width, circumference and vertical height at metatarsal heads (MTHs) level, had been done. Unpaired t-test ($p<.05$) was used for comparison between different conditions.

Result

Nineteen subjects, with foot length 22.0-25.0cm, were recruited in each group. Subject numbers are 17 & 16 in forefoot pain group and control group, respectively. No statistical significant foot & shoe last difference between the two groups in longitudinal length, and width, circumference and vertical height at MTHs level when bipedal standing. At the simulated toe-off posture, statistical significant difference between foot & shoe last in the vertical height at MTHs level was shown. ($P<.05$) There is 5mm tighter in forefoot pain group but 1mm room in control group. At bipedal

standing posture, more pointing toe-box for shoes in the forefoot pain group was shown. Although shoe size is fit at bipedal standing, tight shoe box at simulated toe-off posture, may be related to patho-mechanics of forefoot pain. Shoe fitting at simulated toe-off posture, instead of bipedal standing only, should be emphasised in patient education. Objective 3D footwear fit assessment for diabetic patients with insensate foot is suggested for prevention of dorsal foot ulcers.