

Preliminary Study of Pressure Distribution in Diabetic Subjects, in Early Stages

-  Authors
[Authors and affiliations](#)
-  M. L. ZequeraL. GaravitoW. SandhamÁ. RodríguezJ. A. Alvarado
C. A. Wilches

Abstract

Type 2 diabetes is considered a major public health challenge. Diabetic foot is a multifactorial disorder of vascular, nervous and mechanical origin that can seriously threaten the limb. Indeed, diabetes remains the leading cause of lower-limb amputations worldwide, and the use of imaging technologies can improve early diagnosis for prevention of ulcer development, but its costs can limit its implementation in clinical practice, for homecare monitoring and customized treatment. Previous studies have compared certain parameters between males and females, attributed to anatomical and physiological differences, which could be significant in the distribution of pressure on the foot. The aim of the present study was to evaluate the pressure platform EPS/R1 (LorAn Engineering) in subjects with and without diabetes, of both genders, for its future implementation in clinical practice. Fourteen volunteers, 6 diabetics (4 females, 2 males) and 8 non-diabetics (4 females, 4 males), aged 30 - 70 years, and body mass index below 35, were recruited. Pressure platform EPS/R1 (LorAn Engineering) was used for registering plantar pressure variables: lateral load distribution (LLD), antero-posterior load distribution (APLD), average pressure (AP), body barycenter (BB), foot barycenter (FB), and points of maximum pressure (PML). Variables BB and FB presented interactions with gender and condition. Variables LLD, PML and AP presented interactions with condition and marginal with gender. Variable APLD presented no interactions with gender or condition. In general, subjects without diabetes had similar measurements over the 3 sessions in both genders, while measurements of subjects with diabetes changed as trials progressed. Some gender differences were found. This study indicated that males have better balance compared to females. In particular, it was found that females, in search of balance, prioritized support in the hindfoot, making this area susceptible to ulcers.