Proc Inst Mech Eng H. 2013 Feb;227(2):181-9.

Prevalence of standing plantar pressure distribution variation in north Asian Indian patients with diabetes mellitus: a study to understand ulcer formation.

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Abstract

Diabetes Mellitus is a disorder of metabolism. Foot problems are common in diabetes and altered plantar pressures distribution may lead to ulceration in people with Diabetes Mellitus. Therefore the aim of this study was to investigate standing plantar pressure distribution variations in north Asian Indian diabetes mellitus subjects and its association with duration of diabetes. Thirty three subjects with age range from 40 to 75 years are recruited from AIIMS Endocrinology & metabolism lab Delhi, India and divided into three groups: 11 control subjects (non-diabetic), 11 diabetic subjects without neuropathy (DNN) and II diabetic subjects with neuropathy (DN). Neuropathy status was assessed by measuring loss of protective sensation to 10 gm Semen's Weinstein monofilament. Plantar pressure distributions parameter-Power ratio (PR) was measured during barefoot standing using portable PedoPowerGraph and results are analyzed using one way analysis of variance to detect significant difference between the groups. We found significant ($p < 0.05$; $p < 0.01$) difference in PR value between DN and CG groups in fore foot and hind foot but no significant ($p > 0.05$) difference in PR value was found between DNN and CG groups in the foot. As compared to DNN, DN group have maximum PR variations in the fore foot. Plantar pressure distribution parameter-PR was higher with longer duration of diabetesamong type 2 diabetes subjects. In this study we conclude that plantar pressure distribution parameter-PR was able to distinguish the DN groups from the CG group in hind and forefoot during standing. Increased forefoot PR value is prevalent in the diabetic neuropathic subjects and may be responsible for the occurrence of foot sole ulcers but additional prospective studies are needed. In the future we will investigate the plantar pressure distribution parameter-PR variations in diabetes with obese and osteoarthritis subject.

PMID: 23513989