

## **Association of limited joint mobility and increased plantar hardness in diabetic foot ulceration in north Asian Indian: a preliminary study.**

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### **Abstract**

The aim of this article is to investigate the association of limited joint mobility and foot sole hardness in north Asian Indian type 2 diabetic patients. Limited joint mobility and hardness of the foot sole were measured for 39 subjects attending the AIIMS Endocrinology & Metabolism Clinic. The total subject divided into three groups: 13 control subjects (nondiabetic), 13 diabetic patients without neuropathy and 13 diabetic neuropathy patients. Neuropathy status was assessed using 10 gm Semm's Weinstein monofilament. Joint mobility parameters, such as ankle dorsiflexion/plantar flexion and metatarsophalangeal-1 dorsiflexion/plantar flexion, are measured using a goniometer. Foot sole hardness was measured using a durometer or shore meter. We found that diabetic patients with a neuropathic foot had significantly reduced joint mobility and increased foot sole hardness, placing them at risk for subsequent ulceration. Metatarsophalangeal-1 dorsiflexion/plantar flexion of both feet of diabetic patients had significant correlation (at  $p < 0.05$ ,  $p < 0.001$ ,  $p < 0.001$  level) over age and body mass index. Also ankle plantar flexion/dorsiflexion and metatarsophalangeal-1 dorsiflexion/plantar flexion has a significant correlations (at  $p < 0.01$ ,  $p < 0.05$ ,  $p < 0.001$ ,  $p < 0.001$  level) with foot sole hardness in both feet of diabetic neuropathy subjects. Also linear regression analysis showed that duration of diabetes was significantly associated with the joint mobility parameters. In this study we conclude that joint mobility had reduced further if neuropathy and increased foot sole hardness coexisted owing to high plantar pressures. Hence, both limited joint mobility and increased foot sole hardness appears to be important determinants of foot sole ulceration in diabetic neuropathic subject.

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