Abstract

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Site-specific relationship between plantar ulcer sites and elevated peak plantar pressures.

Aims: The effect of elevated plantar pressures on foot ulcer risk has been reported only across the foot as a whole and not in relation to specific ulceration sites. The great toe is one of the most frequently ulcerated sites on the diabetic foot. We aimed to investigate peak plantar pressure at the great toe in diabetic patients with a previous great toe plantar ulceration and in patients with equally 'high-risk' feet, but with a previous ulceration at another plantar location.

Methods: Great toe peak plantar pressures were quantified during gait using PressureStat™ in three age-matched groups: diabetic patients with neuropathy and plantar ulcer history at the great toe (DPN-UGT; n=9); diabetic patients with neuropathy and ulcer history at other plantar sites (DPN-U; n=6); matched controls without diabetes (C; n=12).

Results: Plantar pressures at the great toe were significantly higher in DPN-UGT (4.58±1.81 kg/cm^2) compared to both DPN-U (2.36±1.09 kg/cm^2; p=0.001) and C (2.42±0.63 kg/cm^2; p=0.009). There were no differences in plantar pressures at the great toe site between DPN-U and C (p=0.650).

Conclusion: We demonstrate a site-specific relationship between previous ulceration and very high plantar pressures. 'High risk' diabetic patients with great toe ulcer history have highest great toe peak plantar pressures. Conversely, 'high risk' patients with ulcer history at sites other than the great toe have 'normal' great toe pressures, similar to controls. Specific plantar sites, identified in clinic with previous ulceration and elevated peak pressures, can be recommended to receive site-targeted offloading to protect against their re-ulceration.

Funding/Acknowledgments: This work was supported by a research grant from Diabetes UK (BDA number: 12/0004565).

Clinical trial number: ISRCTN05585501