Use of an iPad based in-shoe plantar pressure system in a diabetic orthotic clinic.

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Introduction

In diabetes the ability of the foot to respond to loading experienced during movement is frequently compromised, which may lead to complications including ulceration and amputation. Foot orthoses (FOs) can reduce the incidence of ulceration and amputation, by modifying the loads transmitted to the plantar tissues of the foot. It is recommended that instrumented plantar pressure measurement is used in the prescription and evaluation of FOs [1], although this may be challenging in clinical practice.

Method

This study reports on initial experiences using an iPad based in-shoe plantar pressure measurement system in a diabetic orthotic clinic (Pressure Guardian, Tillges Technologies, US). Peak plantar pressure (PPP) was measured at regions of interest (ROIs) with prescribed custom FOs, and with 3.2mm polyurethane (Poron) inlays as a baseline comparison. Data was collected for 24 subjects and 32 separate ROIs. The project protocol was reviewed by the local NHS research governance office and defined as a service evaluation.

Results

Mean baseline PPP was 331.8kPa (range 56.3 – 447.7), mean PPP with FO was 170.4kPa (range 34.8 - 296.0). Mean percentage reduction in PPP was 48.2% (range 10.8 – 81.8%).

Conclusions

Use of the system was found to be feasible although due to time pressures it was not used with every patient. Results indicate that the custom FOs reduced PPP and the plantar pressure system used was sensitive to these changes. An iPad based in-shoe plantar pressure system may be a useful way to increase the use of instrumented analysis in the clinical prescription and evaluation of FOs in diabetes.

References

1 - Bus SA, Haspels R, Busch-Westbroek TE. Evaluation and optimization of therapeutic footwear for neuropathic diabetic foot patients using in-shoe plantar pressure analysis. Diabetes Care [Internet]. 2011 Jul [cited 2019 Jan 3];34(7):1595–600. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21610125