ASSESSMENT OF THE IMPACT OF LOADING PRESSURE ON ENDOTHELIAL FUNCTION IN DIABETIC FOOT

R.G. Edris, (F. Khan, R.J. Abboud)

Department of Orthopaedic and Trauma Surgery, Institute of Motion Analysis and Research (IMAR), Tayside Orthopaedics and Rehabilitation Technology (TORT) Centre, Ninewells Hospital and Medical School.

It has been estimated that the lifetime risk of a diabetic patient developing a foot ulcer is 15-25%. Non-plantar ulcers are more prevalent (52%) with the majority of ulcers located on the dorsal surface or in the interdigital spaces of toes (32%). In addition, the lower healing rates in dorsal compared with plantar ulcers have been previously reported in the literature. All studies and guidelines have so far focused on plantar ulceration including the plantar pressure measurements and relief for ulcer prevention and treatment with no assessment of the dorsal surface.

This study aims to investigate the effect of pressure application and endothelial function on both dorsal and plantar surfaces of the diabetic foot.

In-shoe pressure on dorsal and plantar surfaces of the foot will be recorded using the Pedar system. This pressure will be applied using a custom-made pressure delivery equipment which is designed to deliver a known pressure while housing a Laser Doppler Flowmetry probe that will assess skin blood flow changes. The effect of pressure on skin blood flow response to iontophoresis of Acetylcholine (ACh) and Sodium Nitroprusside (SNP) will be assessed.

Comparing findings in diabetics with that of normal subjects would help to estimate the precise deteriorating pressure which predisposes to foot ulceration. Dorsal pressure measurement and its effect investigation will provide more easily accessible tool for assessment of the diabetic foot. Finally this will add to the understanding of foot ulcers development mechanisms and help in designing future therapeutic interventions to prevent diabetic foot ulceration.