Inter-rater reliability of Doppler waveform analysis amongst health care professionals

Cynthia Formosa, Christian Ellul, Anabelle Mizzi, Stephen Mizzi, Alfred Gatt
Department of Podiatry, Faculty of Health Sciences, University of Malta, Malta

Hand-held Doppler ultrasound examinations of pedal arteries is today one of the most frequently used non-invasive assessment methods employed by health care professionals for the diagnosis and ongoing monitoring of people who are at risk of developing, or are living with, peripheral arterial disease. The aim of this study was to determine the inter-rater reliability of the interpretation of this testing method. An inter-rater reliability study was conducted amongst five experienced qualified podiatrists at a University of Malta Research Laboratory. A research officer at the University of Malta, who was not a rater in this study, randomly selected 229 printed Doppler waveforms from a database held at the same university. Each rater was asked to classify the qualitative spectral waveforms independently as monophasic, biphasic, triphasic and monophasic continuous. Inter-rater reliability of the visual Doppler waveform interpretation amongst the five experienced podiatrists was excellent (K = 0.98). The intra-class correlation test showed a high degree of correlation in waveform interpretation across raters (p = 0.000). This study concludes that when Doppler waveform reports are interpreted by experienced clinicians in the field, accurate interpretation of the patients' lower limb arterial status is accomplished. Careful scrutiny of the current foot screening guidelines do not refer in any way to Doppler waveform analysis in their recommendations, which has been shown in studies to be an important modality for the diagnosis of Peripheral Arterial Disease, when Ankle Brachial Pressure Indices are falsely elevated in calcified arteries. If interpreted correctly, the information obtained can provide a detailed map of lower limb arterial disease early diagnosis and management of this condition.