Paired Non-Invasive Vascular Testing Modalities for Clinical Utility and Arterial Disease Assessment

Roger Schechter, MD and Bradley Bailey, MD

The standard “tool kit” for noninvasive vascular testing (NIVT) in patients with lower extremity wounds is limited by time inefficiency, inaccuracies or both. The sensitive, yet non-specific Ankle-Brachial Index (ABI) for macro-vascular evaluation takes approximately twenty minutes to obtain and has minimal utility when assessing the substantial patient subset with calcified arteries (those on dialysis or with Diabetes Mellitus). Transcutaneous Oxygen Monitoring (TCOM) is reasonably sensitive and specific in detecting micro-vascular disease, but requires excessive time to perform and is highly dependent on skin condition and operator skill level.

Our single-center non-randomized investigation of outcomes for 100 patients with lower extremity wounds will be presented. The study objective unites Skin Perfusion Pressure (SPP) as a measure of micro-vascular integrity with the macro-vascular assessment of Pulse Volume Recording (PVR), obtained with the same laser Doppler device, and compares them to TCOM and ABI combined, to determine which paired micro- and macro-vascular NIVT demonstrated superior time effectiveness and accurate correlation with detection of arterial vascular disease. The time to completion of both pairs of NIVT methods, performed on each patient on admission to the clinic, were measured respectively. The vascular disease detection outcome was correlated with secondary testing and referral outcomes.

The SPP/PVR combination was observed to be substantially more time efficient compared to TCOM/ABI and was also more accurate in vascular disease detection prediction. SPP/PVR therefore provides an improvement over standard NIVT tools utilized in Comprehensive Wound Care Clinics possibly representing a new cost-effective paradigm for micro and macro-vascular screening.