

COMPARISON OF THE DETECTION OF PERIPHERAL ARTERY DISEASE WITH AN IMPROVED AUTOMATED OSCILLOMETRIC DEVICE AND THE STANDARD DOPPLER METHOD

M. Špan¹, G. Gersak², M. Meza³, S. Millasseau⁴, A. Kosir³

- 1 Matjaž Špan, dr. med, International Center for Cardiovascular diseases, Polje 40, SI-6130 Izola, Slovenia, span.matjaz@gmail.com
2 University of Ljubljana, Faculty of Electrical Engineering, Laboratory of Metrology and Quality, Tržaska 25, 1000 Ljubljana, Slovenia
3 University of Ljubljana, Faculty of Electrical Engineering, Digital Signal, Image and Video Processing Laboratory, Tržaska 25, 1000 Ljubljana, Slovenia
4 Pulse Wave Consulting, 95320 Saint Leu la Forêt, France

Objective: In occidental countries more than 20% of people over 65 years of age have peripheral artery disease (PAD) however more than 50% of them are asymptomatic and therefore undiagnosed and untreated. According to current guidelines, ankle brachial index (ABI) should be measured in primary care to screen for PAD. This is however not performed in clinical practice because the standard Doppler method to assess ABI is cumbersome and time consuming. In this study we compare ABI measurements obtained by an improved automated oscillometric device, the MESI ABPI MD device (MESI d.o.o., Slovenia) with the standard Doppler method.



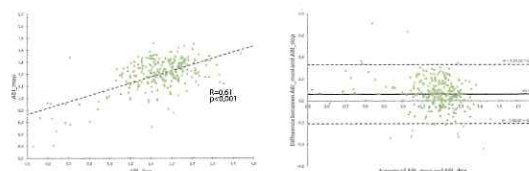
Methods: ABI was measured in a general practice 4 times in random order in each subject: 2 with Doppler probes by 2 operators (ABI_dop) and 2 with the MESI device (ABI_mesi). ABI_dop was measured from the ration of the highest systolic blood pressure from both tibial and dorsalis pedis artery by the highest systolic blood pressure of both brachial artery. ABI_mesi was obtained automatically with simultaneous measurements on three extremities by MESI ABPI MD device.

Results:

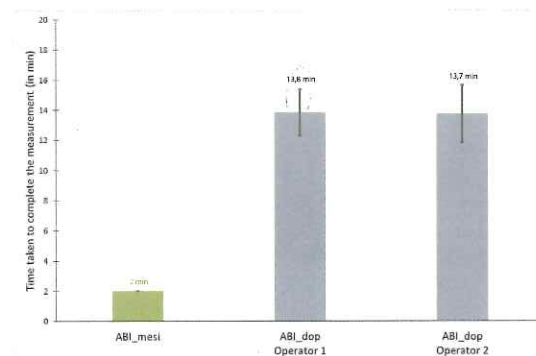
- According to ABI_dop, PAD was present in 10% of the 136 screened subjects ($68,2 \pm 7,4$ years).
- Inter-operator coefficient of variation (CV) was 5,5% for ABI_dop while the intra-subjects CV for ABI_mesi was 3,0%.

Results (continued):

- ABI_mesi was correlated with ABI_dop ($R=0,61$, $p<0,0001$).
- The -difference between the 2 techniques was normally distributed, centred at $0,06 \pm 0,14$, with negligible bias across the range ($R=0,19$, $p<0,0001$). Therefore ABI_mesi provided slightly but significantly higher values than ABI_dop ($p<0,0001$).



- ABI_mesi < 1 had a sensitivity of 85% and specificity of 96% to detect ABI_dop < 0,9 and hence PAD.
- MESI ABPI MD measurements were completed three times faster than Doppler probe measurements.



Conclusions: MESI improved automated oscillometric method offered a faster and repeatable measure of ABI with only a small, clinically irrelevant overestimation of ABI value. The tested MESI ABPI MD improved oscillometric system can be used as screening for patients in general practice in order to comply with current guidelines for the diagnosis of PAD.

This is an abstract of the *Detection of peripheral artery disease with an improved automated device: comparison of a new oscillometric device and the standard Doppler method* paper published in the **Journal of Vascular Health and Risk Management** and is available in full version at www.dovepress.com.