

Factors affecting the validity of the oscillometric Ankle Brachial Index to detect peripheral arterial disease

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BACKGROUND: The use of oscillometric Ankle Brachial Index (ABI) to diagnose peripheral arterial disease (PAD) has raised concern, especially due to a lack of agreement and sensitivity. This study aimed to evaluate those factors affecting the validity of oscillometric ABI in comparison to Doppler ABI to detect PAD. **METHODS:** Through univariate and multivariate linear regression, we studied those factors affecting the differences between oscillometric and Doppler ABI; through univariate and multivariate logistic regression we analyzed the false negative rate of oscillometric ABI to detect PAD. **RESULTS:** We analyzed 197 consecutive subjects (394 legs) from two settings: Primary Care and Vascular Service. The means of oscillometric ABI and Doppler ABI were 1.094 (95% CI: 0.843-1.345) and 1.073 (95% CI: 0.769-1.374) ($P < 0.001$), respectively. In men, covariates explaining the differences between oscillometric and Doppler ABI were Doppler ankle blood pressure ($\beta = -0.610$, $P < 0.001$), ankle circumference ($\beta = 0.176$, $P = 0.004$) and oscillometric brachial blood pressure ($\beta = 0.136$, $P = 0.037$); in women, those were weight ($\beta = 0.351$, $P < 0.001$) and Doppler ankle blood pressure ($\beta = -0.318$, $P < 0.001$). Sensitivity and specificity of oscillometric ABI to detect PAD were 80.6% and 97.4%, respectively, and covariates explaining the rate of false negatives in PAD population were setting ($\text{Exp}(\beta) = 17.21$, $P = 0.009$) and tobacco (packs/year) ($\text{Exp}(\beta) = 1.049$, $P = 0.002$). **CONCLUSIONS:** Although some factors influencing the lack of agreement between oscillometric and Doppler ABI were identified, the correction of oscillometric ABI seems impractical, since Doppler is needed, the bias is not always uniformly distributed and its clinical relevance is

small. According to sensitivity, borderline oscillometric ABI in Primary Care settings and smokers suggest PAD. © 2017 EDIZIONI MINER VA MEDICA.

Ankle Brachial Index

Oscillometry

Peripheral arterial disease

Sensitivity and specificity

aged

ankle brachial index

Article

body weight

calcification

cohort analysis

comparative study

diagnostic accuracy

diagnostic test accuracy study

Doppler flowmetry

false negative result

female

human

major clinical study

male

observational study

oscillometry

peripheral occlusive artery disease

prospective study

receiver operating characteristic

sensitivity and specificity

tobacco consumption

validity

ankle brachial index

brachial artery

Doppler ultrasonography

middle aged

multivariate analysis

oscillometry

pathophysiology

peripheral occlusive artery disease

procedures

statistical model

validation study

very elderly

Aged

Aged, 80 and over

Ankle Brachial Index

Brachial Artery

Female

Humans

Linear Models

Male

Middle Aged

Multivariate Analysis

Oscillometry

Peripheral Arterial Disease

Prospective Studies

Sensitivity and Specificity

Ultrasonography, Doppler