

Calculation of the Ankle Brachial Index

Hasan Kutsi Kabul, Aydogan Aydogdu, Ilker Tasci

Gulhane School of Medicine, Department of Cardiology, Gulhane School of Medicine, Department of Endocrinology and Metabolism, Gulhane School of Medicine, Department of Internal Medicine and Geriatrics, Ankara, Turkey

Dear Editor,

We would like to call the readers' attention to a brief communication published in the issue of January 2012, which concluded increased prevalence of left ventricular hypertrophy in subjects with an abnormal ankle brachial index (ABI). In their study, Albuquerque et al.¹ compared subjects with arterial hypertension with and without an abnormal ABI.

Since the prevalence of a low ABI was found to be 10.5 in a large survey conducted in Brazil², identification and characterization of the subjects with a low or high ABI are of utmost importance. However, use of ABI in research and in clinical practice requires full adherence to guidelines. In this context, the ABI calculation technique recommended by the guideline is not in accordance with the one used in the study by Albuquerque et al.¹. The authors used the mean

of the two readings taken in an ankle to calculate the ABI for the respective limb. However, right or left ABI should be determined by taking the highest of the pedal pulses, either dorsalis pedis artery or posterior tibial artery, in each ankle (not the mean) as the numerator in the formula. Thus, the lowest of the calculated right and left ABIs should be recorded as the final ABI of the patient. When the mean value is used, the value of the numerator decreases, which results in the detection of a higher number of subjects with a low ABI. This is actually the technique recommended by both ACC/AHA 2005 practice guidelines for the management of patients with peripheral arterial disease (PAD)³ and the Inter-Society Consensus for the Management of PAD guideline (TASC II)⁴. Moreover, this issue is one of the reasons why assessment of ABI by automated oscillometric devices cannot fully replicate the classical Doppler technique⁵.

Beyond the findings in this study, application of the correct ABI calculation becomes more important when we consider that, by using this value, the clinicians diagnose PAD, which substantially changes the patient management and prognosis.

Keywords

Hypertrophy, left ventricular; ankle brachial index; hypertension.

Mailing Address: Ilker Tasci •

GATA Iç Hastalıkları Bilim Dalı Etlik, Etlik. 06018, Ankara, Turkey

E-mail: ilkertasci@yahoo.com, itasci@gata.edu.tr

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Response Letter

Knowledge of the ankle-brachial index (ABI) streamlines the process of detection of peripheral arterial disease (PAD) with a sensitivity of 90 to 97% and specificity of 98% to 100%¹. In our study, the ABI was calculated for each lower limb: right and left ABI. The values were obtained as follows: right ABI = highest systolic pressure in right ankle / highest systolic pressure in right or left brachial artery, and left ABI = highest pressure in left ankle / highest systolic pressure in right or left brachial artery.

The methodology we employed to obtain the systolic pressures in the ankle (right and left) and brachial arteries to calculate the ABI was the following: we used the auscultatory

technique mediated by a Doppler ultrasound transducer 4283 Vascular 5-10 MHZ.

To increase the reproducibility of the method, the pressure considered for each pulse (dorsalis pedis or posterior tibial) resulted from the mean of two pressure measurements taken in that pulse^{2,3}. Thus, the numerator used for the calculation of ABI was the highest mean of the pressure measurements taken in each artery (dorsalis pedis or posterior tibial).

Sincerely,

Pedro Ferreira Albuquerque

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