Different Calculations of Ankle-Brachial Index and Their Impact on Cardiovascular Risk Prediction.

Reference:

Espinola-Klein, C., Rupprecht, H.J., Bickel, C., Lackner, K., Savvidis, S., Messow, C.M., Munzel, et al. (2008). Different calculations of ankle-brachial index and their impact on cardiovascular risk prediction. *Circulation*, 118, 961-967.

Scientific Literature Review

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Podiatric Relevance:

This study provides a modified technique for calculating the ankle-brachial index (ABI), which may identify a greater number of patients at risk for cardiovascular events. The ABI is often used by podiatrists as a simple, non-invasive method to assess a patient's circulatory status, as well as to aid in surgical planning.

Methods:

This retrospective study included 831 patients who had been admitted to the University Hospital of Mainz, Germany, with chest pain and were to undergo diagnostic heart catheterization between November 1996 and July 1998. For each patient, the ABI was first calculated according to the American Heart Association's current guidelines: the quotient of the higher of the systolic blood pressures of either the anterior or posterior tibial artery of each limb, and the higher of the left or right brachial systolic pressures. The ABI was then calculated for each patient using a modified technique: the quotient of the lower of the systolic blood pressures of either the anterior or posterior tibial artery of each limb, and the higher of either the left or right brachial systolic pressures. Patients with ABI > 1.5 were excluded from the study. The incidence of cardiovascular events was statistically analyzed with regard to peripheral arterial disease (PAD) prevalence using both the current and modified calculations of ABI. Those patients with ABI < 0.9 in at least one leg by either the current or modified calculation method were defined as having PAD. A Cox regression analysis that included all confounding variables was used to compare the prognostic value of the current and modified ABI calculations.

Results:

Follow-up data were available for 812 patients with a mean follow-up period of 6.6 years. 157 patients (19.3%) experienced cardiovascular events, defined as cardiovascular death, myocardial infarction, or stroke. Patients without PAD (ABI > 0.9 according to the modified ABI calculation) had the lowest cardiovascular event rate (14.8%). Rates were comparable for patients with PAD (ABI < 0.9 according to the current accepted ABI calculation) (28.4%) and those with suspected PAD (ABI < 0.9 according to the modified calculation and ABI > 0.9 according to the current calculation) (25.0%). In the Cox regression analysis which used patients without PAD as the reference group, the hazard ratio was 1.56 for patients with suspected PAD and 1.67 for patients with PAD.

Conclusions:

In this study, the investigators presented novel research on the calculation of the ABI. On the basis of the results, the use of the modified ABI calculation technique (use of the lower of the two ankle pressures) identifies more patients at risk for cardiovascular events than the use of the currently accepted ABI calculation technique (use of the higher of the two ankle pressures). Practitioners should keep these findings in mind when calculating ABI to assess the circulatory status of their patients. However, further research on this topic is warranted because this study did not include population-based trials.