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Original Communication

Reliability of Doppler and Stethoscope Methods of Determining Systolic Blood Pressures: Considerations for Calculating an Ankle-Brachial Index

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Abstract

Purpose

The purposes of this study were to: (1) identify the interrater and intrarater reliability of systolic blood pressures using a stethoscope and Doppler to determine an ante brachial index (ABI), and (2) to determine the correlation between the 2 methods.

Background

Peripheral arterial disease (PAD) affects approximately 8 to 12 million people in the United States, and nearly half of those with this disease are asymptomatic. Early detection and prompt treatment of PAD will improve health outcomes. It is important that clinicians perform tests that determine the presence of PAD.

Method

Two individual raters trained in ABI procedure measured the systolic blood pressures of 20 individuals' upper and lower extremities. Standard ABI measurement protocols were observed. Raters individually recorded the systolic blood pressures of each extremity using a stethoscope and a Doppler, for a total of 640 independent measures.

Results

Interrater reliability of Doppler measurements to determine SBP at the ankle was very strong (intraclass correlation coefficient [ICC], 0.93–0.99) compared to moderate to strong reliability using a stethoscope (ICC, 0.64–0.87). Agreement between the 2 devices to determine SBP was moderate to very weak (ICC, 0.13–0.61). Comparisons of the use of Doppler and stethoscope to determine ABI showed weak to very weak intrarater correlation (ICC, 0.17–0.35). Linear regression analysis of the 2 methods to determine ABI showed positive but weak to very weak correlations ($r^2 = .013$, $P = .184$).

Conclusions

A Doppler ultrasound is recommended over a stethoscope for accuracy in systolic pressure readings for ABI measurements.

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Keywords

ankle-brachial index; peripheral arterial disease

Previous Presentation This study was presented at the 2008 Annual Conference and Exposition of the American Physical Therapy Association in San Antonio, Texas.

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