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REVIEW

Training to Perform Ankle-Brachial Index: Systematic Review and Perspectives to Improve Teaching and Learning

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WHAT THIS PAPER ADDS

Ankle-brachial index (ABI) is widely used to diagnose peripheral artery disease. To date no review has been performed on medical education and ankle-brachial index teaching. This systematic review focuses on the impact of training programs on ABI performance by medical students, or doctors or primary care providers. Using different databases, it was found that only five studies have addressed the impact of such training programs. It is underlined that the literature is sparse, but without good teaching, a task cannot be performed well. High quality studies are required to define the best training program for ABI teaching and learning.

Objective: To conduct a systematic review focusing on the impact of training programs on ankle-brachial index (ABI) performance by medical students, doctors and primary care providers. Lower extremity peripheral artery disease (PAD) is a highly prevalent disease affecting ~202 million people worldwide. ABI is an essential component of medical education because of its ability to diagnose PAD, and as it is a powerful prognostic marker for overall and cardiovascular related mortality.

Methods: A systematic search was conducted (up to May 2015) using Medline, Embase, and Web of Science databases.

Results: Five studies have addressed the impact of a training program on ABI performance by either medical students, doctors or primary care providers. All were assigned a low GRADE system quality. The components of the training vary greatly either in substance (what was taught) or in form (duration of the training, and type of support which was used). No consistency was found in the outcome measures.

Conclusion: According to this systematic review, only few studies, with a low quality rating, have addressed which training program should be performed to provide the best way of teaching how to perform ABI. Future high quality researches are required to define objectively the best training program to facilitate ABI teaching and learning.

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INTRODUCTION

Ankle-brachial index (ABI) is the recommended method for diagnosis of lower extremity peripheral artery disease (PAD), a highly prevalent disease affecting ~202 million people worldwide.[1,2] It is an objective test initially proposed by Winsor,[3] which has high specificity and sensitivity, provided that is performed by well-trained health professionals.[4] Besides its ability to diagnose PAD, ABI is of interest as it is a marker for overall and cardiovascular related mortality.[2,5–7]

Although used as a medical procedure for more than 50 years, the method for measuring, calculating and interpreting the ABI was standardized and guidelines were published in 2012.[2] A summary of these guidelines is presented in Fig. 1.

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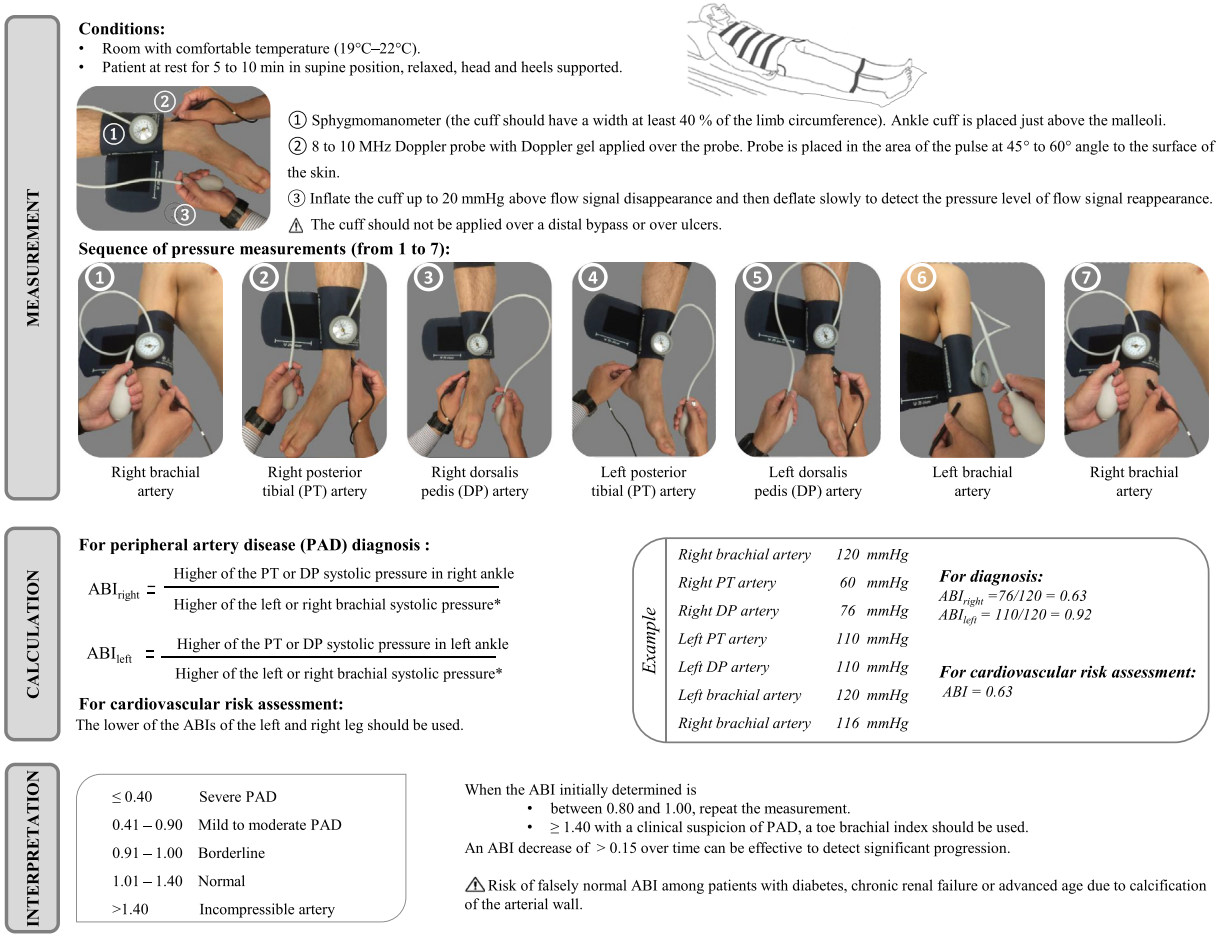

Figure 1. How to perform the ankle-brachial index (ABI) in clinical practice according to American Heart Association (AHA) recommendations. *For the right arm, average the first and second measurements except if the difference exceeds 10 mmHg. In that case, the first measurement must be disregarded.

Despite its non-invasive nature and inexpensive cost, a significant proportion of individuals with PAD (over 44%) remain undiagnosed in clinical practice.[8–10] Different factors have been proposed to explain why ABI is underused. For instance, it is reported by some physicians that performing ABI is time consuming, whereas others find the equipment expensive.[11,12] A lack of knowledge and technical expertise can represent another barrier to use the ABI for diagnosing PAD and stratifying cardiovascular risk.[13–15]

Despite the importance of the ABI in medical care, only few studies have addressed which training program should be used to provide the best way of teaching how to perform ABI. The aim of the present study was to conduct a systematic review focusing on the impact of training programs on ABI performance by either medical students, or doctors or primary care providers.

MATERIALS AND METHODS

The literature was systematically reviewed and synthesized according to the method below.

Search strategy

An electronic search was performed using Medline, Embase, and Web of Science databases, (updated May 2015). The search was conducted by two independent investigators (SC and GM) using the following key terms: “Ankle Brachial Index,” “Arterial occlusive diseases/diagnosis,” “Vascular Diseases/diagnosis,” “Peripheral Arterial Disease/diagnosis,” “Educational measurement,” “Teaching,” “Clinical competence,” “Training,” “Students medical,” “Internship,” “residency,” “undergraduate,” “residents,” “GPs,” and “general practitioners.”

This combination aimed to focus on articles dealing with the impact of training programs on improving ABI performance. No filter was used.

Selection criteria

Two investigators (SC and GM) read the titles and abstracts of the articles yielded by the computer assisted search to select articles for full text reading. An article was considered suitable for full text reading if the abstract focused on the