Reviewer’s report

Title: Diagnostic accuracy of resting systolic toe pressure for diagnosis of peripheral arterial disease in people with and without diabetes: a cross sectional case control study

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Reviewer: Martin Fox

Reviewer's report:

Good study. Topical to the growing area of peripheral arterial disease diagnosis and in particular early disease diagnosis. Study type, aim, methods, results and discussion generally good. The study population looked at - people with suspected PAD and those with and without diabetes is a very relevant population. The study adds some depth, questions and additional information to the current available literature in this area. I would like to see it published.

A couple of specific points:

How reliable is CDU considered to be as a clinical diagnosis reference standard for people with diabetes and distal arterial disease? I have an understanding that it is less reliable with diagnostic accuracy below the knee?

in line 188, is the 30 and 70 mmHg thresholds referring to ankle or toe pressures, in relation to wound healing outcomes?

in line 234, is the '< 96 mmHg' referring to people without diabetes?

Do you have any thoughts on whether medial wall arterial calcification could extend to digits, thus affecting toe pressures and potential PAD diagnostic thresholds? This does show up on foot x rays, but appears under-reported in the current literature.

Do you have any thoughts on whether foot / toe oedema, hyperaemia or infection could affect toe pressures and potential PAD diagnostic thresholds in the population studied?

Other areas for your consideration:

I struggled to understand why toe systolic pressures were not also compared to brachial systolic pressures in the subjects in the study, effectively giving more information for analysis and being
more comparable to the body of existing literature on toe brachial index. For example, if people in the study were hypertensive / hypotensive during testing, this would show up in brachial systolic pressures and potentially have a significant impact on toe systolic pressures.

Could this have a significant impact on your results and the conclusion?

I wonder if the discussion needs to include this issue and the conclusion possibly adapted to refer to the likelihood of an impact on the suggested diagnostic thresholds for PAD, based on the toe systolic pressures? I would have concerns about clinicians possibly accepting a 'magic' number (systolic toe pressure) for early PAD diagnosis, without performing a robust lower limb vascular assessment. You have of course suggested this should not be a stand-alone test, but the temptation for a quick diagnostic assessment might be strong.

I am very interested in clinical research such as this, which looks at early PAD diagnostic assessment. It is an under-represented area in the current PAD literature. I find this paper thought-provoking and showing a depth of understanding, with the current issues that are challenging front-line clinicians. I look forward to any further feedback on the questions and areas for consideration I have raised.

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I have received payment for expert advice in helping to develop a clinical education resource for a medical devices company (Huntleigh), which involved reviewing clinical evidence, reviewing the educational video script and demonstrating use of Dopplers, syphg cuffs and toe systolic pressures.

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