

Survey of Ankle Brachial Pressure Index Use and its Perceived Barriers by General Practitioners in the UK

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Key words: Ankle brachial pressure index (ABPI), peripheral arterial disease (PAD), general practitioners (GPs)

Research question:

- Is there a better way to increase survey response rates from General practitioners?
- Is ABPI feasible as a diagnostic test in primary care?
- If not feasible, what are the perceived limitations of its use in primary care?

ABSTRACT

Background: Peripheral arterial disease (PAD) is often undetected until complications arise, despite it being a major healthcare burden and an independent risk factor for cardiovascular death and systemic atherosclerosis. Appropriate diagnostic tools are as important as clinical knowledge and skill to investigate patients for PAD. Currently the ankle brachial pressure index (ABPI) is the recommended diagnostic tool for PAD.

Purpose: We explore current opinions on ABPI by general practitioners (GPs) and the limitations to its implementation in primary care practice.

Methods: GPs attending a regional one day study event, were surveyed in October 2014. Survey questionnaires were placed at the top of each conference pack

for each attendee. Participants were requested to complete the questionnaire at the beginning of the day, at three breaks and at the conclusion of the study day. The survey questionnaire was modelled from the ABI utilisation survey questionnaire used in the PARTNERS preceptorship study.

Results: All respondents were GPs, with a survey response rate of 77.1%. All respondents regarded ABPI as an important test, that is primarily performed by nursing staff (79.5%) in their respective GP surgeries. 70% and 97% of GPs found ABPI useful for the diagnosis of asymptomatic and symptomatic PAD respectively. Nevertheless only 69% of GPs regarded ABPI as a feasible test in primary care practice. Time constraints (84%), staff availability (89%) and staff training (72%) were cited as the main limitations to its use.

Conclusions: Targeted training of nursing staff may improve ABPI utilisation, although a less time consuming test for PAD, may be another option.

INTRODUCTION

Peripheral arterial disease (PAD) is an early indicator of systemic atherosclerosis¹ and an independent predictor of cardiovascular mortality^{2,3}. It is a major health and financial burden⁴. PAD affects about 20-22% of people over the age of 45⁵. Of these patients, about 10% have typical intermittent claudication⁶. The severity of PAD symptoms generally depends on the severity of both large vessel stenosis/occlusions and the presence or absence of microvascular disease⁷. Therefore, patients with complete arterial occlusion may remain asymptomatic⁸. Patients with asymptomatic PAD have a 3 to 4 fold excess risk of having coronary artery disease and cerebrovascular disease^{5,9}. Recent focus has been on the primary prevention of this disease¹⁰, by improving the diagnostic practices in primary care¹¹. Currently the ankle brachial pressure index (ABPI) is the recommended diagnostic tool for PAD^{12,13}.

Recent surveys on the use of ABPI have suggested that primary care practitioners should receive targeted training to perform and analyse ABPIs¹⁴. Similar recommendations were made over a decade ago, following a large multicentre programme that assessed the practice and perceptions of primary care clinicians, with the PAD Awareness, Risk and Treatment: New Resources for Survival (PARTNERS) in the US¹¹. Following this, a PARTNERS preceptorship program enrolled and trained primary care staff in the technique of performing and interpreting ABPIs. An ABPI utilization survey conducted on participants of both the PARTNERS and the PARTNERS preceptorship program, summarized that primary care clinicians accepted ABPI as a simple diagnostic tool and their role to diagnose PAD despite existing barriers¹⁵. Nevertheless, evidence to support the uptake of ABPIs in primary care is lacking in the US and worldwide.

The purpose of this survey was to assess if English general practitioners (GPs) regarded ABPI to be an important test and what were the potential limitations to its implementation in a primary care setting in the UK.

METHODS

The Leicestershire, Northamptonshire and Rutland regional ethics committee 1 was consulted prior to conducting the survey. Ethical approval was deemed unnecessary. A survey was conducted on GPs attending a one day 'GP masterclass regional study day' at the University of Leicester conference centre in October 2014. The whole day event was organised by Spire Healthcare Leicester and was open to all GPs in the UK. On the day of the event, participants were seated in clusters. For each seat, survey questionnaires were placed at the top of the conference packs. Following the opening address by the chairperson, the researcher (RYK) and his research was briefly introduced. The chairperson requested all attendees to complete the survey questionnaire and the event feedback form prior to the first lecture. The request was repeated at three break sessions and at the end of the event. Participants were requested to leave survey responses on their table at the end of the day. Participants were informed of the availability of the researcher throughout the day, if there were any queries.

The GP masterclass regional study day organised by the Spire Leicester was initiated in 2012. It is designed to assist GPs in meeting their revalidation needs by collecting continuing professional development credits, in addition to networking opportunities. The event has a good attendance record over the past two years (148 and 168 respectively). The event feedback form was introduced in the event's second year (2013). The event feedback questionnaire response rate in 2013 was 61.9% (104 of 168 attendees). The survey was conducted in this manner owing to a better response rate with a direct face to face approach^{16,17}.

A cross sectional survey was conducted, using a survey questionnaire modelled from the ABI utilization survey originally created by the steering committee of the PARTNERS preceptorship program in the US¹⁵, with minor relevant modifications to suit the UK healthcare system and to allow comparisons to be made. Like the utility questionnaire, this was a multiple choice close-ended questionnaire. The survey questionnaire comprised of eight questions (Figure 1). The first and second question identified the participants' profession and opinions on diagnostic options for PAD. The remaining questions focussed on ABPI. These included who performs the test, how often it is used, how useful has it been in the participant's practice, how feasible it is to incorporate it into practice, whether it is a good screening tool for select patient groups and finally what are the perceived limitations to its use in primary care practice. The survey questionnaire was piloted on members of staff within the department and the departmental statistician with an interest in survey questionnaires. Modifications were made based on suggestions and feedback obtained.

Raw data was double entered into the SPSS data entry software. All variables were transcribed with the help of a codebook. All data collected on the questionnaires were anonymous. Missing values were coded in the SPSS programme and included in the data analysis.

RESULTS

A total of 118 GPs attended the study day. The survey questionnaire response rate was 77.1% (91 of 118 attendees) compared to the event feedback response rate which was 84.7% (100 of 118 attendees). All 91 respondents were GPs. The results attempt to answer five questions. These were whether ABPI is regarded as an important test (question 2), whether ABPI was utilised and if so, who is involved (questions 3 and 4), to gauge perceived importance of ABPI for PAD diagnosis (question 5 and 6), whether ABPI as a diagnostic test for PAD is feasible in primary care (question 7) and if so, what are the limitations to its use (question 8). Results are summarised in Figure 2.

Importance of diagnostic tests for PAD diagnosis

All respondents felt that risk assessment and ABPI played an important role in PAD diagnosis. Opinions on the role of questionnaires and ankle pressures were divided. Similarly most GPs were unsure of the role of TBPI and toe pressures.

ABPI utilization and staff involvement in PAD diagnosis

The vast majority of ABPIs were performed by nurses (26.1% nurse practitioners, 36.4% registered nurses and 17% district nurses) according to the respondents with the majority of GP surgeries utilizing ABPI on a monthly (42%) to annual (30%) basis.

Perceived utility of ABPI for the care of PAD

The majority of GPs found ABPI to be more useful for the diagnosis and clinical management of symptomatic patients compared to asymptomatic patients. As a screening tool for, the respondents felt that ABPI was most useful in diabetes, followed by the elderly and patients with chronic renal failure, but was least useful for healthy patients.

Feasibility of ABPI in GP practice

Although the vast majority of respondents deemed ABPI to be either moderately (54%) or very feasible (15%), a third (31%) deemed it to be not feasible.

Limitations to ABPI implementation

The limitations were divided into 7 broad categories. These included administrative (time and financial constraints), structural (availability of space), ABPI related (clinical significance of ABPI and ABPI interpretation), patient-related (willingness), staff-related (availability, willingness and training), equipment-related (availability of doppler and cuffs) and test performance-related issues (application of cuff, performance of walk test or handheld doppler examination or the presence of wounds).

Limitations to implementation – administrative

84% respondents regarded time constraints to be a major or moderate limitation, with the opinion on financial constraints divided in this survey.

Limitations to implementation – structural

Just over half of the respondents viewed the availability of space within the GP surgery as a major or moderate limitation.

Limitations to implementation – ABPI as a test

Under half (43%) of the 74 respondents felt that the clinical significance of ABPI was not a limitation to its use. Interestingly, the majority of respondents, found interpreting ABPI results as a major or moderate (51%).

Limitations to implementation – patient related

Patient willingness to have ABPI as a test was not a limitation in most respondents (83%).

Limitations to implementation – staff related

The vast majority (89%) of the respondents felt staff availability was a major or moderate limitation to ABPI use. Similarly 72% respondents regarded staff training to be a major or moderate limitation. Opinion on staff willingness being a limitation to ABPI performance was inconclusive.

Limitations to implementation – equipment related

62% regarded the availability of doppler and cuff availability to be a major or moderate limitation respectively.

Limitations to implementation – test performance related

A third of respondents did not view the application of cuff to be a limitation. However, 66% viewed performance of the walk test and 68% viewed the presence of wounds to be main

limitations. Although only 3.4% GPs admitted to performing ABPIs, it was interesting to note that 61% of the respondents regarded performing the doppler examination to be a major or moderate limitation.

DISCUSSION

Commissioners and providers are primarily responsible for implementing the National Institute for Health and Care Excellence (NICE) pathway for lower limb peripheral arterial disease in the UK¹⁸. As these are primarily GPs, our survey focused at GPs to provide a better insight into practical aspects that aid or hinder the implementation and facilitation of ABPI use in primary care practice. All participants in our survey were GPs (100%), compared to the cohort studied in the PARTNERS program (54% physicians), PARTNERS Preceptorship (73% physicians) and in the most recent survey by Davies et al (55% GPs). Our survey findings reflect those of the ATTEST study findings in which French GPs performed ABPI in only a third of the patients with PAD¹⁹. ABPI was mainly performed by nurses (79.5%) in this survey, compared to the PARTNERS program (38%) and the survey conducted by Davies et al (67.4%). Respondents of this survey agree with previous survey findings, that ABPI is more useful in symptomatic than asymptomatic PAD¹⁵. As a screening tool for PAD in diabetics, ABPI is generally accepted (78%) by survey respondents. This response is in line with current NICE guidelines¹⁸. It is interesting to note that more than half the respondents (55%) felt ABPI to be a useful screening tool for PAD in patients with chronic renal failure or who were elderly, which reflects an understanding by GPs of factors that pose a risk to PAD. Although, the US preventative services task force (USPSTF) does not recommend ABPI as a screening test²⁰, the NICE guidelines recommends assessment of PAD in those with suspected PAD, whether symptomatic or not¹⁸.

Unlike previous surveys¹⁵, where the majority of clinicians in the PARTNERS program (90%) and Preceptorship program (88%) believed ABPI to be a feasible test, in our survey only two thirds (69%) regarded it as being feasible. Using a 70% or more arbitrary cut off as significant limitation, the primary limitations are time constraints (84%), staff availability (89%) and staff training (72%). Time constraints have also been a limitation in previous surveys by Mohler et al (54%)¹⁵ and Davies et al (72%)¹⁴. It is intriguing that all surveys conducted to date including this one, have highlighted time constraints and staff training to be primary limitations to ABPI implementation. However, if we used a 50% cut-off for major or moderate limitations, as used by previous surveys^{14,15}, financial constraints (61%), space

availability (57%), cuff and doppler availability (62% each), presence of wounds (68%), performance of walk test (66%) and the interpretation of ABPI (51%) are limiting factors.

The NICE guideline development group consider the incremental resource needs for ABPI measurements to be small compared to the benefits of early PAD diagnosis⁴ and this test adds between 5 to 15 minutes to the time needed for clinical examination¹⁸. However attempts to reduce the time for ABPI measurements, such as using the pulse oximeter instead of the handheld doppler^{21,22} or an oscillometric automated blood pressure device²³, the reliability of such alternatives have not been widely accepted. Under such circumstances, delegation of ABPI performance to competent and trained staff would appear reasonable. Targeted formal training of students have been shown to enhance the reliability of ABPI²⁴. Although, the targeted educational initiative was studied in the ABI utilization survey¹⁵, the follow up after the training survey was conducted a few months after the training program. Clinical audit tools for PAD in primary care and an online education tool are available for healthcare professionals in the UK¹⁸. An ideal test should be reliable, quick to perform, easy to use, interpret and be affordable. Such a test would circumvent many of these limitations. Alternatively further studies to assess the true impact of targeted ABPI training and the sustainability of practice, should be conducted after an adequate period of time.

STRENGTHS AND LIMITATIONS

The advantage of this study is the encouraging response rate from GPs. This survey does not address the actual performance of ABPIs, as reflected by the study being less representative of members of staff who actually perform the test, and more representative of clinicians who would request for the test. As the majority of respondents who attended the event were from Leicestershire, it is possible, but unlikely, that these results are not representative of the opinions of GPs nationally. Furthermore, unlike the recent survey by Davies et al¹⁴, this survey concentrates less on the actual methods for performing the test, but rather attempts to understand reasons behind why ABPI may or may not be used in primary care.

CONCLUSION

GPs play more of an administrative role when it comes to performing ABPIs in the UK. Time constraints, staff availability and staff training are the main limitations to its use in primary care. Possible solutions include targeted standardized ABPI training of competent and delegated members of staff. Another alternative is to conduct further research into alternative technologies which may simplify the recognition of peripheral arterial disease.

CONFLICTS OF INTEREST

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Figure 1: Peripheral Arterial Disease Survey Questionnaire

Peripheral Arterial Disease Screening Survey

We, at the Vascular Surgery Research Group, University of Leicester kindly request for a few minutes of your time to complete this survey to assess current practice in the diagnosis of Peripheral Arterial Disease (PAD) at primary care facilities.

1. Please select your profession

- | | |
|--|--|
| <input type="checkbox"/> General Practitioners | <input type="checkbox"/> Health Care Assistant |
| <input type="checkbox"/> Registered Nurse | <input type="checkbox"/> Technician |
| <input type="checkbox"/> Nurse Practitioner | <input type="checkbox"/> Other |

2. Which of the following do you consider important in diagnosing PAD?

	Yes	No	Unsure
Risk Factors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pulse Examination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Questionnaires	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ankle Brachial Pressure Index (ABPI)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ankle Pressures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Toe Brachial Pressure Index (TBPI)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Toe Pressures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Who performs the ABPI at your practice?

- | | |
|---|--|
| <input type="checkbox"/> General Practitioner | <input type="checkbox"/> Health Care Assistant |
| <input type="checkbox"/> Nurse Practitioner | <input type="checkbox"/> Technician |
| <input type="checkbox"/> Registered Nurse | <input type="checkbox"/> Other |

4. How often do you use the ABPI?

- | | |
|----------------------------------|-----------------------------------|
| <input type="checkbox"/> Weekly | <input type="checkbox"/> Annually |
| <input type="checkbox"/> Monthly | <input type="checkbox"/> Never |

5. How useful have you found the ABPI to be in the diagnosis and clinical management of

	Very Useful	Moderately Useful	Not Useful
Asymptomatic PAD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Symptomatic PAD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. How feasible is incorporating the ABPI into your daily practice?

- | | |
|--|--|
| <input type="checkbox"/> Very Feasible | <input type="checkbox"/> Moderately Feasible |
| <input type="checkbox"/> Not Feasible | |

7. Is ABPI a good screening tool for PAD in the following patients?

	Yes	No	Unsure
Healthy patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diabetics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic Renal Failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Elderly (>65 years)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. What factors if any, limit the utilization of the ABPI in your clinical practice?

	No limitation	Major limitation	Moderate limitation	Minor limitation
Time Constraints	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial Constraints	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical Significance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Staff Availability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patient Willingness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Staff Willingness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Staff Training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of Space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of Doppler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Availability of Cuffs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Application of Cuff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Performing Walk test	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Presence of Wounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Performing Handheld Doppler examination	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ABPI interpretation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 2: Peripheral Arterial Disease Survey Responses

