

# Peripheral Arterial Disease Diagnosis and Management in Primary Care: A Qualitative Study

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## Abstract

**Background:** The patients with peripheral arterial disease (PAD) have impairment in lower limb function which negatively impacts mobility and daily activities. Over a period of time, the patients with PAD experience difficulty in their walking ability (i.e., walking distance, speed, and/or stair climbing). The reduced walking ability leads to the mobility loss and thereby an inability to perform the daily activities of live. **Objective:** This study highlights the gap in literature on the basis of the views of the patients as well as the experience of primary care health professionals on the diagnosis and the management of PAD. It also demonstrated the problems that the patients and the primary care health professionals experience regarding the PAD diagnosis and management, and reveals the issues that could explain the delayed in the diagnosis and under- management of PAD. It also throws light on the need for providing the information to PAD patients and also to motivate them for regular follow-up. A more proactive attitude is needed for early identification of PAD by probing for the symptoms during the routine interactions. **Method:** Semi-structured interviews and focus groups were conducted with PAD register patients (P; n = 20), practice nurses (PNs; n = 10), district nurses (DNs), n = 10), registered nurses (RN; n = 10), and General Physicians (GPs; n = 20). **Results:** The attitudes of health professionals towards PAD, difficulty in the accessing tests, and the delay in the patient reporting impacted upon the diagnosis. Some health professionals had a proactive while others had a reactive approach to PAD identification. Patients had lacked the understanding about PAD and many reported a delay in consulting their GP after the onset of PAD symptoms. After the diagnosis, only few were attending for regular GP follow-up. **Conclusion:** Patient education about PAD symptoms and risks could address the problem of under-reporting. Improved information regarding the PAD should be given to the patients after the diagnosis and the introduction of annual follow-up (at minimum) is warranted.

**Keywords:** Primary care, Peripheral Arterial Disease (PAD), Qualitative study.

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## INTRODUCTION

The progressive occlusion or stenosis of arteries of the extremities is called as the peripheral arterial disease (PAD) [1]. This occlusion of arteries results in the deficiency of oxygenated blood which leads to degeneration of the nerves, vasculature and other tissues. PAD can cause intermittent claudication i.e., the pain on exertion or walking impairment. Moreover pain at rest, as well as loss of the sensation in extremities which leads to the critical limb ischemia with persistent chronic wounds as well as infections and can ultimately end up in a gangrenous lesion which requires amputation of the digits or an extremity [2, 3]. Atherosclerosis is the most common cause of PAD, alongwith the risk factors that include age 65 years and older, diabetes mellitus, smoking, dyslipidemis and

hypertension. Smokers are at higher risk for the progression of disease because smoking increases the risk of PAD to 3-fold. Diabetes mellitus is also a high risk factor for the development and progression of PAD and can cause the endothelial dysfunction. In the diabetes mellitus patients, there is 26% increase in the risk of PAD with every one percentage increase in the glycosylated hemoglobin [4]. Hypertension is another risk factor affecting approximately 80% of patients with PAD and it also increases the risk of symptomatic PAD (intermittent claudication) in men and women by 2.4- to 3.9-fold. Dyslipidemia which is the combination of elevated triglycerides and elevated lowdensity lipoprotein (LDL) along with a low level of high-density lipoprotein (HDL) is also a risk factor for PAD. Most likely PAD is associated with a high risk of myocardial infarction, coronary artery disease and

cerebrovascular disease [5], and it is a marker for the cardiovascular death and disability with a mortality rate of 22% in 4.4 years [6]. PAD is caused by the atherosclerosis of peripheral arteries. The symptoms of this disease may not be evident for many years, moreover, majority of the individuals with PAD are asymptomatic [7] or attribute their symptoms to harmless causes. As a result, the majority of PAD cases remain undiagnosed, and therefore awareness for early signs and symptoms of the disease is needed. Patients with PAD suffer a dual load of the delayed diagnosis of their condition as well as infrequent use of the limb-sparing treatments. Due to the lack of awareness on the part of both the patients and the health care providers in primary health care and also due to the limited availability of diagnostic tests and delay in referral for the endovascular evaluation, the peripheral arterial disease (PAD) often progresses to a point of irreversible damage [8]. The amputations can be prevented or delayed by 85% through the early diagnosis, patient education, lifestyle modification and endovascular intervention [9]. This qualitative study reports the findings from primary health care to diagnose PAD. This was a qualitative study comprised of patients, general physicians, practice nurses, registered nurses and district nurses to identify the issues they encounter in the diagnosis of PAD and the management in primary care, and also the impact of these issues. Peripheral arterial disease (PAD) is a common condition that causes significant morbidity and can lead to reduced life expectancy, and can also result to have a serious economical impact. It is often under-diagnosed in primary care, partially because of the fact that the current recommended ankle-brachial pressure index (ABPI) test for PAD in primary care is time-consuming and also it is technically challenging to perform [10]. With the advent and availability of a simple reliable diagnostic test can potentially facilitate early identification of PAD and accordingly can deliver the appropriate treatment. The goal of this article is early diagnosis of PAD, appropriate referrals, and thereby establishment of a multidisciplinary treatment strategy which may include early angiography, appropriate use of endovascular interventions, and thus can decrease the morbidity, limb loss and mortality. Because a large proportion of patients with PAD are asymptomatic or minimally symptomatic, the condition is often under-reported and therefore under-treated [11]. The symptomatic patients often delay in consultation with their doctor and report when the condition is at an advanced stage [12]. For the assessment and diagnosis of PAD, detailed history, clinical examination and ankle brachial pressure index (ABPI) testing with a handheld Doppler ultrasound probe are recommended [13]. Although PAD is not curable but the cardiovascular risk can be reduced by changing the lifestyle such as smoking cessation, weight control, exercise and also by medication [14]. It is recommended for all the patients to do supervised exercise. The patients with mild PAD should be taken care of in the primary care. However, if

the condition does not resolve or worsens, or if there are some problems with the diagnosis then they should be referred to the secondary care [15].

## METHODS

The present study was done in a primary care center by qualitative methods i.e., semi- structures in-depth interviews and focus groups which were used to identify the issues from the perspectives of the study participants. The study participants comprised in two groups which included the patients (P; n=20) and health care givers i.e., general practitioners (GP; n=20), practice nurses (PN; n=10), registered nurses (RN; n=10) and district nurses (DN; n=10) (Figure 1). One on one interviews were conducted with the patients (P) and health care givers which included GP, PN, RN, DN. For the focus groups, a sample was drawn which included health care professionals (GP, PN, RN, DN). These interviews and focus groups were aimed to early diagnose the PAD and manage the case accordingly. A topic guide was developed to structure the interviews and the focus group. The topic guide was designed to encourage the participants to reflect on successful and unsuccessful practices to cover perceptions of both the patients as well as the health care givers in order to successfully early diagnose the PAD and also in the context of innovative health technology that can aid in the diagnosis of PAD which can be practiced in the primary health centers. In order to avoid the imposing known issues about the diagnosis as well as management of PAD from the available literature and/or from the experience of the clinical team, we have used the broad topic guides that covered the patients' history of PAD, experience of diagnosing the disease or being diagnosed with PAD, and how to manage PAD. Due to the broad topic guides, the participants were able to raise the issues by themselves rather than these issues being put forward by the interviewer. The potential interviewees were prior informed about the study which mainly outlined the aims and objectives of the study. Those participants who were agreeing to participate were also invited to recommend the additional candidates for the interview. The individuals who agreed to participate in the study were provided with the study information sheets in advance, and the consent forms were signed prior to the start of the interviews. All the interviews and focus groups were digitally recorded, anonymized and transcribed in full. Interviews were typically around 40 min in length and were conducted on an individual, face-to-face basis. Each focus group was approximately 60 min long and conducted at the workplace of the participants.

## RESULT

Upon drawing an interpretative approach, the interviews were analyzed by an inductive approach without the aid of a software program. Data transcripts were read through to familiarize with the content and were then subjected to thematic or analysis. Core

themes were identified for each participant and then studied within each case. The themes were then reviewed and discussed within the focus groups with any discrepancies resolved through this process. Data was collected from a total of 70 participants. In this sample of participants 30 nurses, 20 GPs, and 20 patients with PAD participated. The key themes elicited from the data are outlined in Table 1 and 2. Quotations are presented with participant identifier codes, including 'I' for interview participants and 'FG' for focus group participants, and abbreviations for participant type (for example, 'PN' for practice nurse and 'P' for patient). In the present study, phenomenographic analysis was done. It was analyzed that the health care givers recognized the importance of early diagnosing PAD and also understood that early identification of the disease can help in secondary prevention of the cardiovascular disease. They mentioned that by an early identification, we get provided an opportunity to prevent and manage the progression of the often debilitating symptoms of PAD: 'If we start with the antiplatelet and manage to lower the cholesterol and making sure that the blood pressure is monitored, we can do some great progress, in terms of not having a heart attack or a stroke.' (I/GP16). Although PAD was considered to have 'gained importance in recent years' (FG/GP7), however no one mentioned that they are actively looking for it, instead they given a reactive response rather than a proactive approach: 'PAD is an important marker of the vascular disease and therefore require treatment [...], however, we're not actively searching out for the patients of PAD and so we are only really responding or treating to the symptomatic patients those who report by themselves rather than actively looking for it.' (FG/GP4). For some health professionals, early diagnosis of PAD was not considered a priority. Besides, in comparison to the other conditions, there was no immediate effect of PAD interventions. One GP described an approach of questioning to identify intermittent claudication in a consultation: 'The patients of PAD have multiple other pathologies also and so PAD is not at the front of everybody's mind and therefore it can be easily forgotten' (I/GP17). A change in lifestyle advice should be given like: eating healthy food, 'Quit smoking' sensible alcohol intake, as well as motivation towards 'physical exercise' (FG/GP 8). Only few HPs have

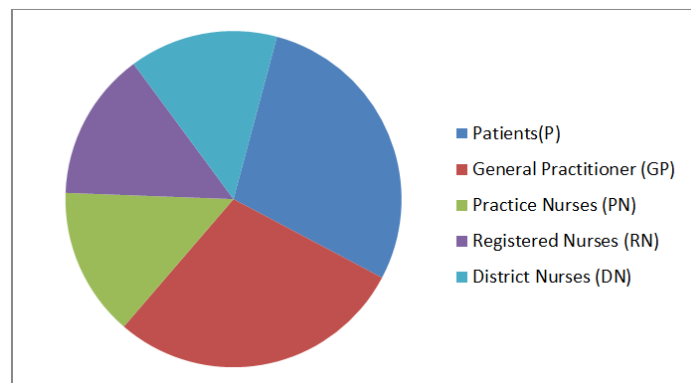
mentioned the exercise referral schemes. According to a general consensus, patients are referred to the secondary care when their PAD symptoms are severe and the effective treatments are not available in primary care. When there is availability of ABPI, a 'borderline' result would prompt referral (I/GP3). One practice refers a number of patients to secondary care because they present with more advanced PAD: 'We don't normally encounter the patients in early PAD, they generally report later when the symptoms worsen.' (FG/GP1). From the patients' perspectives - Some patients had ignored these symptoms or they attributed them to something else, for example 'dull aching legs', 'There was pain in my calf while walking and I neglected it for some time, then it gradually got worse and I ended up having a stent put in.' (I/P4). A number of patients were left without any real explanation of what was the cause: 'I consulted the GP about my symptoms and he didn't tell me at the time what he thought it was. He only advised me to walk and have a rest in between while walking' (I/P5). The awareness of PAD should be given the same priority as other more commonly encountered health problems: I don't actually know, all I can understand is that I have arthritis' (I/P16). Few patients reported that they were being told about the exercise but they didn't mention regarding the supervised exercise or the other treatment option available (I/P13). Some patients had been prescribed statin and/or antiplatelet medication. Most of the patients said that the medication had made only little difference; however, few said that the symptoms had not worsened: 'When I was not under any medication, I couldn't walk more than 100 meters. It was really very frightening. Now, I take clopidogrel in the morning and statins in the evening and since then I've never had any problem. It is almost 16 months now.' (I/P10). Only few patients mentioned regarding the opportunity for the regular review and follow up (I/P12). For most of the patients, there was no regular follow-up and some patients had not reported to their GP about for a year after the diagnosis of PAD. Some patient also relied upon other health professionals to determine whether their PAD was worsening. Few patients considered it their own responsibility: 'As a patient I think that we should be the first one to notice if any changes are happening and then we should report out general practitioner.' (I/P1)

**Table-1: Themes: diagnosis and management of PAD-Patients' perspective**

S. No	Themes	Patients' Perspective	Possible Outcome
1.	Understanding of the symptoms and risk factors of PAD	Symptoms attributed to old age	Delay in consultation
2.	Reporting to health professional	Prioritize other symptoms	Delay in diagnosis
3.	Adherence to health professional's instructions	Little explanation about the reason for symptoms and risk factors of the disease	Delay in management
4.	Regular follow- up	No regular follow- up arranged and not highlighting the complications of the disease	Delay in Improvement

**Table-2: Themes: diagnosis and management of PAD-Health Care Professionals' perspective**

S. No	Themes	Health Care Professionals' Perspective	Possible Outcomes
1.	Understanding of the risk factors of PAD	Patients have low health expectations,	Delay in consultation
2.	Understanding of signs and symptoms of PAD	Delay in reporting of patients	Delay in diagnosis
3.	Accessibility to ABPI in primary care	Difficulty in diagnosis due to inadequate resources	Delay in diagnosis
4.	Prescribing exercises and treating accordingly	Inability to understand the priority of the disease by patients and poor patient's compliance	Delay in management
5.	Follow-up	When symptoms worsen, not prioritizing annual check-up	Delay in success of treatment
6.	Referral to secondary care	Patients views and suitability for treatments	Delay in improvement

**Fig-1: Categorization of Participants**

## DISCUSSION

A variety of factors have impact on the diagnosis of PAD which include delay in patient reporting to physician, the attitude of health professionals towards PAD, difficulties in accessing ABPI tests [16]. The diagnosis of PAD is often based upon the patients' presenting symptoms rather than the clinical tests [17]. Health professionals were clear in the view about the management and they also acknowledged that the complexities occur with patients that often have comorbidities. Few GP prescribed exercise programmes for intermittent claudication. No one had mentioned the guidelines for PAD. The main issues from the patients' perspective were obtaining the diagnosis and follow-up. Some patients were not aware about the disease progression or they have rarely discussed it with their GP, as they believed that only little could be done. There was a lack of understanding about the condition among the patients [18]. Patients often delayed the consultation with their GP and also attributed the symptoms to old age. Moreover, the health professionals offered the annual review, however, only few patients in the present study reported for the review. Health professionals also believed that educating the patient about the symptoms and risks of PAD, and also screening could solve the issue of under-reporting of the patients [19]. If ABPI is a part of the process, then the screening could be problematic but questioning about the exercise tolerance could identify those who warrant further investigation.<sup>20</sup> Patient annual reviews could provide an opportunity to early diagnose PAD. The present article highlighted the gap

in the literature on the patient perspectives and the experience of primary care health professionals regarding the diagnosis and management of PAD. It also demonstrated the difficulties that the primary health care health professionals and the patients experience in relation to the diagnosis and management of PAD and thereby, reveals the issues that could explain the delayed diagnosis and hence under-treatment of PAD.

## CONCLUSION

There is a need for the general awareness of PAD among the patients, better information regarding the risk factors as well as the associated symptoms of PAD to patients; more accessibility to the PAD diagnostics; and a greater adherence to NICE guidelines, specifically about prescribing exercise programmes. Considering introversion of the patients about consulting their problems with the general physicians, health professionals should routinely try to enquire for PAD in their interactions with patients particularly those who are at higher risk in order to identify the disease and if those require further investigations. Moreover, those diagnosed patients should have a regular follow-up. Till now, there have been only few research studies which explore the impact of spreading awareness of PAD, enhanced information, or specific identification for PAD. The present study highlights the need for: the improved information to PAD patients and also the introduction of regular follow-up; a more proactive attitude to PAD, identification symptoms of PAD during the routine

interactions; and a greater adherence to the PAD guidelines.

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