

ORIGINAL RESEARCH

A study on prevalence of peripheral vascular disease in patients with diabetic foot

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ABSTRACT

Background: Diabetic foot complications remain a significant concern in healthcare, often compounded by the presence of peripheral vascular disease (PVD). Understanding the prevalence of PVD in patients with diabetic foot is crucial for effective management and prevention of associated complications. This study investigates the prevalence of PVD using ankle-brachial index (ABI) and Arterial Doppler in a cohort of patients with diabetic foot. **Objective:** The primary aim of this observational study is to assess the prevalence of PVD in patients with diabetic foot through the measurement of ABI and Arterial Doppler. The study further aims to identify associations between PVD prevalence, patient demographics, and diabetes-related factors. **Methods:** Conducted at the Department of General Surgery, National Institute of Medical Sciences and Research, Jaipur, this single-institution study spanned from July 1, 2022, to July 31, 2023. The study included 95 patients meeting inclusion criteria, encompassing those with type-2 diabetes mellitus and diabetic foot who provided informed consent for participation. Patients willing to undergo or those who had undergone Arterial Doppler study of the lower limb were included. Detailed history, clinical examinations, ABI measurements, and additional investigations, including HbA1C and Arterial Doppler of the lower limb, were conducted after obtaining informed consent. **Results:** Ninety-five patients admitted to NIMS Hospital, Jaipur, with diabetic foot were included in the analysis. The study revealed a notable prevalence of PVD, with 47.3% of patients affected. Age ranged from 41 to 78 years, with a mean average of 52.0±7.2 years and a male to female ratio of 3.75:1. Significant associations were observed between the duration of diabetes, severity of PVD, and age. Advanced age and poorly controlled diabetes emerged as notable risk factors for PVD. **Conclusion:** This study contributes valuable insights into the prevalence of PVD in patients with diabetic foot. The observed prevalence of 47.3% underscores the importance of vigilance in this population. The study recommends the use of ABI as a screening tool for early detection and risk stratification based on disease severity. Additionally, the integration of Arterial Doppler alongside clinical methods proves essential for a comprehensive evaluation and the subsequent management of diabetic individuals with peripheral vascular disease.

Keywords: Peripheral Vascular Disease, Diabetic Foot, Ankle-Brachial Index, Arterial Doppler, Diabetes Mellitus, Prevalence, Risk Factors, Screening.

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INTRODUCTION

Diabetes mellitus, a global health concern, manifests in multifaceted complications, and among them, diabetic foot complications stand as a poignant testament to the intricate challenges faced in managing this chronic condition. Central to the cascade of complications associated with diabetic foot is the often-concealed adversary – peripheral vascular disease (PVD). PVD, characterized by impaired blood flow to the extremities, plays a pivotal role in exacerbating diabetic foot complications, leading to heightened morbidity and mortality.

Understanding the nuanced interplay between diabetes, peripheral vascular disease, and the resultant impact on the diabetic foot is imperative for developing effective preventive strategies and targeted

interventions. This study embarks on a focused exploration, aiming to unravel the prevalence of peripheral vascular disease in patients grappling with diabetic foot complications. By employing sophisticated diagnostic tools such as ankle-brachial index (ABI) and Arterial Doppler, we delve into the intricate landscape of vascular health in this specific diabetic cohort.

RATIONALE FOR THE STUDY

The rationale behind this investigation stems from the pressing need to comprehensively grasp the prevalence of peripheral vascular disease in patients with diabetic foot. While diabetes-induced peripheral neuropathy is a well-recognized contributor to foot complications, the concurrent impact of vascular

compromise remains an underexplored dimension. A clearer understanding of the prevalence and associations between peripheral vascular disease, patient demographics, and diabetes-related factors can pave the way for early detection, targeted interventions, and improved patient outcomes.

SIGNIFICANCE OF THE STUDY

This study holds paramount significance in several domains of healthcare. Firstly, it contributes to the growing body of knowledge surrounding diabetic foot complications by shedding light on the prevalence of peripheral vascular disease. Such insights are crucial for clinicians, enabling them to tailor interventions that address both neuropathic and vascular components of diabetic foot pathology. Additionally, the study underscores the importance of utilizing advanced diagnostic tools like ABI and Arterial Doppler for early detection, enabling timely and targeted management strategies.

In pursuit of these objectives, our study unfolds within the walls of the Department of General Surgery at the National Institute of Medical Sciences and Research, Jaipur, over a carefully delineated timeframe from July 1, 2022, to July 31, 2023. A cohort of 95 patients, meeting specific inclusion criteria, becomes the canvas upon which we paint a detailed picture of the intricate relationship between diabetes, peripheral vascular disease, and diabetic foot complications. Through this exploration, we aspire to contribute not only to academic literature but, more importantly, to the enhancement of clinical practices and the holistic care of individuals grappling with the challenges of diabetes and its associated complications.

MATERIALS AND METHODOLOGY

- Study design: Single institution based observational study.

- Study place: Department of General Surgery, National Institute of medical sciences and research, Jaipur.
- Study period: 1st July 2022 to 31st July 2023
- Sample size: 95

INCLUSION CRITERIA

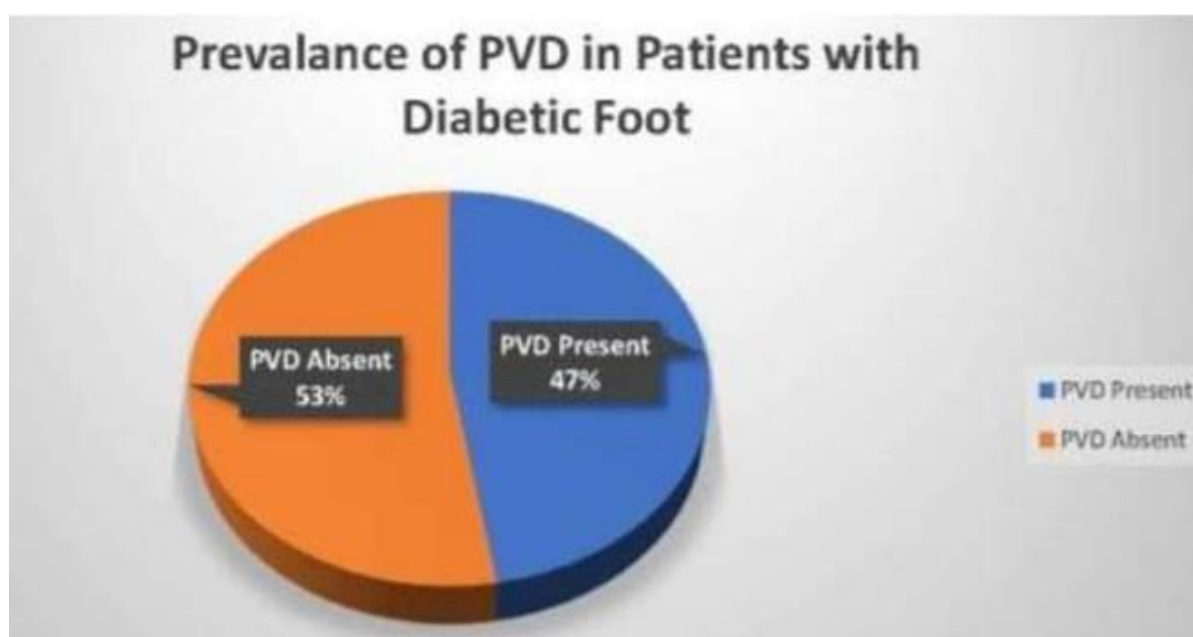
- Patients with type-2 diabetes mellitus with diabetic foot.
- Patients who have given consent to take part in the study.
- Patients who have undergone or are willing to undergo Arterial Doppler study of the lower limb.

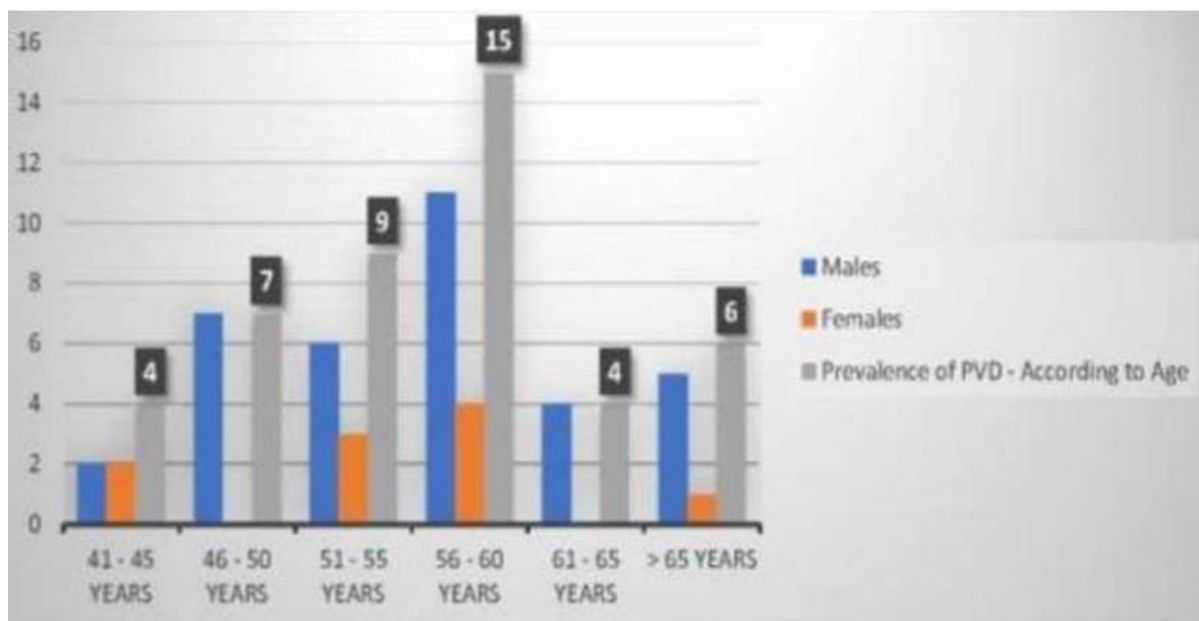
EXCLUSION CRITERIA

- Patients with type1 diabetes mellitus, diabetes associated with pregnancy and lactation.
- Patients who didn't undergo or are not willing to undergo Arterial Doppler study of the lower limb.
- After taking informed consent from patients with diabetic foot, detailed history and clinical examination was done including ABI measurement followed by various investigations like HbA1C and Arterial Doppler of the lower limb

RESULTS

- The present study included 95 patients with diabetic foot admitted to NIMS Hospital, Jaipur.
- Prevalence of PVD in patients with diabetic foot is 47.3%.
- The age of the patients ranged from 41 to 78 years. Most of the patients are in the age group of 4th & 5th decades.
- The mean average age is 52.0 + 7.2 years and male to female ratio is (3.75 : 1).





- There is significant association between duration of diabetes and prevalence of PVD and severity of the peripheral vascular disease.



ABI Grading	No. of Cases	Percentage
Mild	20	44.5%
Moderate	17	37.8%
Severe	8	17.7%
Total No. of Cases	45	100%

- Advanced age and poorly controlled diabetes increase the risk of PVD.

	Severity of PVD		
	Mild	Moderate	Severe
41 – 45	4	0	0
46 – 50	4	3	0
51 – 55	5	4	0
56 – 60	6	5	4
61 - 65	0	2	2
More than 65 Years	1	3	2

- There is significant association between older age group and prevalence of PVD.

Glycemic Control	No. of Patients	Percentage
Good (< 6.5%)	15	33.3%
Fairly Good (6.5 – 7.9%)	17	37.8%
Poor (>8%)	13	28.9%
Total No. of Cases	45	100%

CONCLUSION

- The prevalence of PVD in patients with Diabetic foot is 47.3% in this study
- Male preponderance is seen.
- ABI will serve as a screening modality for the early detection of peripheral vascular disease, and it can be very helpful in risk stratification of the patients depending on the severity of the PVD.
- The present study and others in the past have consistently proved the benefits and need of investigating diabetics for peripheral vascular disease through clinical palpation for peripheral pulses and ankle-brachial index. The use of Arterial Doppler along with clinical methods can be of great significance in the proper evaluation and appropriate management of these individuals.

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