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RESEARCH ARTICLE

A cross-sectional study to assess the prevalence of compromised peripheral circulation among patients with Diabetes Mellitus in selected hospital of Navi Mumbai.

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Abstract: ***Background***: : Diabetes mellitus is a prevalent non-communicable disease associated with microvascular and macrovascular complications. Diabetic foot changes, including ulcers and infections, significantly contribute to morbidity, hospitalization, and amputation. In India, socio-cultural practices such as barefoot walking, improper footwear, and delayed reporting of foot lesions exacerbate the risk. Early diagnosis, foot care education, and continuous support are critical to prevent complications. Aim of the Study: To assess the prevalence of compromised peripheral circulation among patients with Diabetes Mellitus. ***Methodology:*** A cross-sectional study was conducted from January to May 2025 among 525 diabetic patients admitted to medical-surgical wards or attending the diabetic OPD of a hospital in Navi Mumbai. Participants were selected using a convenient sampling technique. Data on demographics and health history were collected via semi-structured questionnaires. Neurovascular assessment of the lower extremities was performed using the Modified In low's Foot Screen, stratifying perfusion as mild, moderate, severe, or very severe impairment.***Results:*** Adequate lower limb perfusion was observed in 70% of participants; 14% had mild, 13% moderate, and 3% severe impairment. Neurovascular perfusion was significantly associated with age, education, occupation, and duration of diabetes. Conclusion: The study highlights a substantial proportion showing compromised circulation. Structured, skill-based education, routine monitoring, and motivational interventions are essential to improve self- care, prevent complications, and enhance quality of life among diabetic patients.

Keywords: Diabetes mellitus, Diabetic foot, Knowledge, Practices, Peripheral circulation.

INTRODUCTION:

Background: Diabetes mellitus is one of the most prevalent non-communicable diseases worldwide and a leading cause of morbidity and premature mortality. Chronic uncontrolled hyperglycaemia results in microvascular (retinopathy, nephropathy, neuropathy) and macrovascular (cardiovascular and peripheral arterial disease) complications.

Proper diabetic foot care is a structured clinical process essential for limb preservation in patients with diabetes. Diabetic neuropathy, microvascular disease, and biomechanical or anatomical abnormalities increase the risk of ulceration, infection, and amputation. Neuropathic changes reduce protective sensation. Microvascular compromise impairs tissue perfusion. Musculoskeletal deformities such as hammertoes, claw toes, and ankle equinus elevate plantar pressures. Collectively, these factors contribute to tissue breakdown in the diabetic foot.

Diabetic foot changes are one of the most severe and debilitating complications of diabetes. About 12% of people with diabetes develop diabetic foot changes or ulcers during their lifetime. It is a primary contributor to low quality of life, increased socioeconomic burden, hospitalization, morbidity, and mortality. Foot ulcers are precursors to about 85% of lower limb amputations. Pre-ulcerative changes such as dry skin, cracks, nail infections, toe deformities, and interdigital infections can further compromise foot integrity, increasing the risk of ulceration and subsequent complications if not managed appropriately.

Despite these risks, early diagnosis, lifestyle modification, timely treatment, and continuous support can significantly reduce complications. A coordinated approach involving patients, healthcare providers, and families is essential to mitigate the rising impact of diabetes and improve quality of life.

One of the most neglected areas of diabetes care in India is foot care practices. People walk barefoot due to social, religious, and economic factors. Inappropriate footwear uses and delayed reporting of foot lesions are caused by poverty and illiteracy.

Delayed reporting of foot lesions is often attributed to the loss of protective sensation in the feet, a common complication of diabetic neuropathy. This sensory impairment prevents individuals from recognizing early signs of injury or infection, leading to delays in seeking care and increasing the risk of severe complications. To prevent such complications, examination of the foot changes by physicians plays a vital role. There are very few physicians performing foot examinations. This lack of attention to foot health in patients with diabetes

underscores the need for increased awareness and training among healthcare professionals

NEED OF THE STUDY:

Diabetic foot has great burden on the health system also, as it is the commonest reason for hospitalization of diabetic patients (about 30% of admissions) and absorb some 20% of the total health-care costs of the disease more than all other diabetic complications. Especially in a developing country, like India, treating diabetic foot may account for 40 percent of health resources. Limb amputation itself is associated with many socioeconomic consequences for patients like, loss of productive hours at inpatient department, permanent loss of income, decreased social acceptance etc. Also, following primary limb amputation, contralateral limb amputation after two years will be observed in nearly 9% of the patients and mortality is 14% in India.14But with practice of proper prevention and treatment guidelines, 85% of these amputations are preventable. In India, the prevalence of diabetic foot ulcers in the clinic population is 3.6%.14Socio-cultural practices such as barefoot walking, religious practices like walking on fire, use of improper footwear and lack of knowledge regarding foot-care attributes towards increase in the prevalence of foot complications. Studies have shown that hyperglycaemia control, cessation of smoking, proper foot hygiene, daily inspection of feet for any trauma, use of proper footwear and early medical help can prevent the incidence of DFU by 50-60%.

The researcher is a nursing professional with a keen interest in diabetic care and preventive health practices. Having observed the high incidence and severe consequences of diabetic foot among patients, the researcher was motivated to study this issue to promote awareness and improve preventive behaviors. With a strong foundation in clinical observation and patient

education, the researcher aims to contribute to evidence-based nursing interventions that can reduce complications, hospitalizations, and amputations related to diabetic foot. This study reflects the researcher's dedication to enhancing patient outcomes through education, prevention, and holistic nursing care.

AIMS OF STUDY: The present study aim was assess the prevalence of compromised peripheral circulation among patients with Diabetes Mellitus.

MATERIAL AND METHODS:

A cross-sectional study was conducted on patients with Diabetes mellitus admitted in the Medical Surgical wards and attending the diabetic OPD of a hospital in Navi Mumbai. A survey was done where about 525 samples were assessed for their knowledge and practices regarding foot care after seeking their consent using convenient sampling technique. Demographic data, health history was collected using semi-structured questionnaire.The neurovascular assessment of the lower extremities was done using a Modified In low's Foot screen and as per the scores then patients were stratified into categories of impaired peripheral circulation as mild, moderate, severe and very severe impaired circulation. A cross -sectional study was carried out from January 2025 to May 2025. Total of 525 people with diabetes were included in the study. A Modified In Low's Foot Screen was utilised to assess the level of their peripheral circulation.

RESULTS AND OBSERVATIONS:

Section I: Demographic Profile of Participants

In the present study, the majority of participants, 166 (58.3%), were in the age group of 48–57 years. Males (58.3%) outnumbered females (41.7%), indicating a male predominance. Regarding physiological parameters, most participants (73%) had a normal BMI, while 14.5% were underweight, 11.9% were overweight, and only 0.6% were obese. A considerable proportion of participants showed poor glycemic control—37.9% (n=199) had random blood sugar levels above 200 mg/dl, and 43.4% (n=228) had HbA1C levels greater than 7%

Section I: Findings related to Neurovascular Assessment

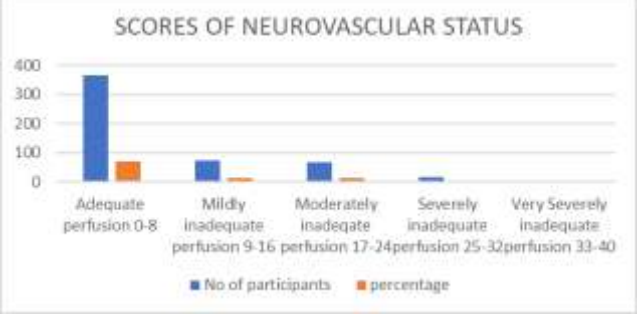

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Fig No 1. Distribution of participants as per scores of neurovascular statu

The neurovascular assessment of the lower extremities revealed that 70% (n=366) of participants had adequate perfusion. Mildly inadequate perfusion was seen in 14% (n=74), moderate impairment in 13% (n=69), and severe impairment in 3% (n=16). No cases of very severe perfusion deficit were observed.

Section II: Findings related to Associations Between Variables In Statistical analysis Neurovascular perfusion showed significant association with age, education, occupation, and duration of diabetes, indicating that both demographic and clinical factors influence foot health status among diabetic patients

Demographic Variables	Level of Neuro Vascular Perfusion						Chisquare Test	P-Value	Sig. at 5% level
	Adequate	Mild Inadquate	Moderate Inadequate	Severely Inadequate	Severely Very Inadequate	Total			
Age Groups									
18 – 27	5	2	0	0	0	7	26.953*	0.029	Yes
28 – 37	43	2	7	0	0	52			
38 – 47	83	10	12	2	0	107			
48 – 57	110	25	17	6	0	166			
58 – 67	69	23	14	4	0	110			
68 – 77	50	12	19	2	0	83			
Total	**366**	**74**	**69**	**16**	**0**	**525**			
Gender									
Male	208	42	48	8	0	306	4.452	0.217	Not
Female	158	32	21	8	0	219			
Educational Qualification									
Illiterate	58	16	12	3	0	89	37.280**	0.000	Yes
Primary	88	29	20	4	0	141			
SSC	136	19	25	3	0	183			
HSC	26	5	8	6	0	45			
Graduate &above	58	5	4	0	0	67			
Occupation									
House wife	130	28	14	8	0	180	37.684*	0.001	Yes
Skilled Labour	87	15	28	2	0	132			
Unskilled Labour	12	6	6	1	0	25			
Service	105	20	10	4	0	139			
Business	10	0	7	0	0	17			
Retired Person	22	6	4	1	0	32			
Dietary Pattern									
Vegetarian	72	6	10	4	0	92	6.765	0.080	Not
Non Vegetarian	294	68	59	12	0	433			
Duration of DM									
0 – 5	201	32	30	8	0	271	30.406**	0.000	Yes
5 – 10	93	18	13	6	0	130			
10 – 15	48	11	8	1	0	68			
15 and more	24	13	18	1	0	56			

Table-1.: Association between level of Neuro Vascular Perfusion with selective Demographic Variables

DISCUSSION

The findings of the present study are consistent with existing literature on diabetic foot complications and associated knowledge-practice gaps. According to the International Working Group on the Diabetic Foot (IWGDF) guidelines, approximately 20% of diabetic patients experience compromised circulation. This aligns closely with the present study, where 26% of participants exhibited compromised peripheral circulation. Similar trends were observed in the studies by Tola et al. (2017) and Prompers et al. (2016), which reported prevalence rates of 21.1% and 25%, respectively, confirming the persistence of circulatory impairment among diabetic patients globally.

Comparable results were seen in the study by Kaluachari et al. (2020), where 46.6% of participants had inadequate knowledge, slightly lower than in this study. The same study found 50% of participants had a moderate risk of foot ulcer development, while in the present study, 70% showed adequate perfusion and 3% had severely inadequate perfusion, suggesting early signs of vascular compromise.

CONCLUSION

Although most patients exhibited adequate lower limb perfusion, approximately one-fourth showed varying levels of circulatory compromise, highlighting a concerning risk for future complications such as ulceration, infection, and amputation if preventive measures are not taken promptly.

These findings emphasize the pressing need for structured, skill-based education programs tailored to the specific needs of diabetic patients. Continuous clinical monitoring, regular screening for neurovascular changes, and individualized counseling can bridge the existing gap between knowledge and actual practices. Furthermore, empowering patients through motivational interventions and self-management training can foster long-term adherence to preventive care. Early identification and management of those with impaired circulation are vital in reducing the incidence of diabetic foot complications.

Conflict of Interest

The authors certify that they are not involved in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

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