



## **Foot Ulcers and Risk Factors among Diabetic Patients Visiting Surgery Department in Medical College Hospital Bikaner, Rajasthan**

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### **Abstract**

**Introduction:** Diabetes Mellitus (DM) is one of the most widespread non communicable diseases across the world. Two types of complications are encountered usually with DM: microvascular and macrovascular.

**Material and Method:** Hospital based prospective study. From August 2015 to July 2016. 50 patients reporting to the General Surgery dept. within study duration and eligible as per inclusion criteria will be included in the study.

**Results:** 58.0% patients were having peripheral neuropathy, 64% were having >10 years of diabetes, 46% were having peripheral arterial disease, 40% were having history of prior ulceration, 36% patients were having diabetic Charcot joint & 28% were having uncontrolled hyperglycemia.

**Conclusion:** Diabetes Mellitus is a lifelong disease and diabetic foot complications can be life threatening, physically incapacitating, costly to treat and result in extensive morbidity.

**Key words :** Diabetes, foot ulcers, neuropathy.

### **Introduction**

Diabetes mellitus is as old as mankind and perhaps humans know it from early ages. It is one of the most

deeply studied disease and is still un-understandable ailment that human deal with. As we are digging deeper into the molecular basis of the disease mind boggling results are coming out. It is not a single disease but a constellation of diseases that it gives birth to i.e. the complications.

Diabetes mellitus is characterized by chronic hyperglycemia and disturbance of carbohydrate, fat & protein metabolism associated with absolute or relative deficiency in insulin secretion and/or insulin action.<sup>1</sup>

Diabetes is known for its micro & macro vascular complications like retinopathy, neuropathy, cardiovascular & peripheral vascular disease. One of the most devastating complications of diabetes is 'Diabetic Foot' which is responsible for > 50% non-traumatic major limb amputations.<sup>2</sup>

The World Health Organization (WHO) defines diabetic foot as the lower limb of a diabetic patient that has the potential risk of pathologic consequences, including infection, ulceration and/ or destruction of deep tissues associated with neurological abnormalities, various degree of peripheral neuropathy, vasculopathy and superimposed infection are mainly responsible foot ulceration. Ulcers which develop are difficult to treat due to poor wound

healing which results from a combination of neuropathy, ischemia and hyperglycemia.

An inciting event such as unnoticed trauma through which micro-organisms gain entry, sluggish leukocyte response and high sugar content leads to destruction of proper host defense mechanisms which spread in subcutaneous and sub facial planes to the deeper tissues. Superficial ulcers are mainly colonized by staphylococcus aureus and/or streptococcus pyogenes while deep infections like osteomyelitis and abscesses result from a combination of aerobic and anaerobic micro-organism (gram positive cocci, gram negative bacilli like Escherichia coli, Proteus and Klebsiella asp. and anaerobes including bacteroids and Peptostreptococci.)<sup>3,4,5</sup>

**Materials & Method**

**Study design:** Hospital based Cross sectional study.

**Study duration:** Six months (Mar-Aug 2016)

**Study place:** Dept. of Surgery, S.P.Medical College and P.B.M Hospital, Bikaner

**Study population:** All patients of Diabetic foot attending to Dept. of Surgery, S.P.Medical College and P.B.M Hospital, Bikaner

**Sample size:** 50 patients reporting to the Surgery dept. within study duration and eligible as per inclusion criteria

**Inclusion Criteria:** All patients of Diabetic foot who gave informed verbal consent

**Exclusion Criteria:**

Diabetic foot associated with venous ulcers and lymphedema.

**Assessment Tool:** Pre designed Pre structured questionnaire containing questions regarding

Clinical History, Demographic data, Risk factors for limb amputations and various treatment modalities was used.

**Study Methodology:**

After obtaining permission of Institutional Ethical Committee and obtaining informed verbal consent from eligible study participants, all details of patients along with relevant investigational details were recorded in questionnaire.

**Data analysis:**

Data thus collected were entered into excel and were then analyzed with help of SPSS software through tables, diagrams and appropriate statistical test wherever required.

**Results**

Table-1: Distribution of cases according to Age (N=50 cases)

Age group (years)	No.	Percentage
0-30 years	3	6%
31-50 years	13	26%
51-70 years	26	52%
> 70 years	8	16%
Total	50	100%
Means age ( years)	54.64	
SD	19.57	

In present study, maximum 52% patients belonged to age group was 51-70 years followed by 13(26%) in 31-50 age group , 3 (6%)cases in 0-30 age group and 8(16%) cases in more than 70 year age group.

Table-2: Distribution of cases according to Sex (N=50 cases).

Sex	No.	Percentage
Male	39	78%
Female	11	22%
Total	50	100%

Table-2 shows that male patients (78%) contributed to larger proportion of our study population as compared to females (22%).

Table-3: Distribution of cases according to risk factors responsible for ulceration:

RISK FACTOR	No.	(%)
Peripheral neuropathy	29	58.0
Foot Deformity	13	26.0
Diabetic Charcot Joint	18	36.0
Trauma	4	8.0
Improperly fitted shoes	5	10.0
Peripheral Arterial Disease	23	46.0
Callus	8	16.0
H/O Prior Ulceration	20	40.0
Higher Plantar Foot Pressure	9	18.0
Limited joint mobility	16	32.0
Uncontrolled hyperglycemia	14	28.0
Chronic Renal Insufficiency	2	4.0
Diabetes duration (>10 yrs)	32	64.0
Older Age	4	8.0
Poor Foot Hygiene	11	22.0
Poor Vision	6	12.0

Above table shows that 58.0% patients were having peripheral neuropathy, 64% were having >10 years of diabetes, 46% were having peripheral arterial disease, 40% were having history of prior ulceration, 36% patients were having diabetic Charcot joint & 28% were having uncontrolled hyperglycemia.

Table-4: Distribution of cases according to presence of comorbidities-

Comorbidities	No.	(%)
Renal	1	2.0
Ophthalmic	6	12.0
Cardiovascular	2	4.0
Other	-	-

Above table shows that 12% of patients were having ophthalmic problems whereas 4% & 2% were having cardiovascular and renal problems.

### Discussion

This hospital based cross-sectional study was conducted in surgery dept. PBM hospital Bikaner attached with S.P.M. college Bikaner. 50 patients reporting to the General Surgery dept. within study duration 6 months (March to Aug. 2016) and eligible as per inclusion criteria were included in the study.

Wheel Lock <sup>6</sup> did a study which revealed that the youngest age with diabetic foot was 32 years and the oldest age was 89 years. In the present study , maximum 52% patients belonged to age group was 51-70 years followed by 13(26%) in 31-50 age group , 3 (6%)cases in 0-30 age group and 8(16%) cases in more than 70 year age group.

When compared with Wheel Lock <sup>6</sup> series, there is not much difference in the oldest group but the youngest patient was found to be 16 years younger than the compared study.

Mayfield et al <sup>7</sup> did a study on sex wise distribution of diabetic foot which included 32 males and 29 females.

### Conclusion

Diabetes Mellitus is a lifelong disease and diabetic foot complications can be life threatening, physically incapacitating, costly to treat and result in extensive morbidity.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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