



## CLINICAL PROFILE AND OUTCOME OF PATIENTS SUFFERING FROM DIABETIC FOOT ULCER.

### General Surgery

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### ABSTRACT

**Background:-** Diabetes is one of the most prevalent chronic diseases: in 2010, one study reported that 285 million adults worldwide had diabetes and this figure is projected to rise to 439 million by the year 2030. It is estimated that approximately 20% of hospital admissions among patients with DM are the result of DFU. Indeed, DFU can lead to infection, gangrene, amputation, and even death if necessary care is not provided. This study was conducted in SGRRIM&HS, Dehradun with an aim to evaluate clinical profile and outcome of patients suffering from diabetic foot.

**Materials & Methods:-** A prospective study was conducted for 1 year with follow-up of upto 6 months. All patients admitted with diabetic foot ulcer were included. Patients with traumatic pathology to bone and soft tissue, suffering from central nervous system diseases as paraplegia, hemiplegia & vascular diseases were excluded. Patients were evaluated by proper history, examination and necessary investigations as per proforma enclosed. Treatment was given as per standard treatment guidelines and the results of treatment were noted. The data collected, was evaluated to see the outcome of treatment.

**Results:-** Majority of patients were male and of age group >40yrs. Most common blood parameter associated with higher chance of amputation was deranged lipid profile.

**Conclusion:-** Patients of diabetic foot with raised HbA1c more than 8.5 & increased serum creatinine had a prolonged hospital stay.

### KEYWORDS

Diabetic foot ulcer, Diabetes, Amputation, Lipid profile, HbA1c, Serum Creatinine

### INTRODUCTION

Diabetes is one of the most prevalent chronic diseases: in 2010, one study reported that 285 million adults worldwide had diabetes and this figure is projected to rise to 439 million by the year 2030<sup>1</sup>. In the USA, diabetes mellitus (DM) affects 9.9 % of the population over 40 years of age, of which 30 % suffer from lower extremity diseases<sup>2</sup>. It is estimated that the annual population-based incidence of a diabetic foot ulcer (DFU) ranges from 1.0% to 4.1%. The lifetime incidence may be as high as 25%<sup>3</sup>. Foot problems in diabetics can frequently be life or limb threatening, yet have not received the same level of attention as other diabetes complications<sup>4</sup>. DFU is considered as a major source of morbidity and a leading cause of hospitalization in patients with diabetes<sup>5</sup>. It is estimated that approximately 20% of hospital admissions among patients with DM are the result of DFU. Indeed, DFU can lead to infection, gangrene, amputation, and even death if necessary care is not provided<sup>6</sup>. Furthermore, DFU is responsible for substantial emotional and physical distress as well as productivity and financial losses that lower the quality of life<sup>7</sup>.

This study was conducted in SGRRIM&HS, Dehradun with an aim to evaluate clinical profile and outcome of patients suffering from diabetic foot.

### MATERIALS AND METHODS

The present study was conducted in the Department of Surgery at Shri Guru Ram Rai Institute of Medical & Health Sciences, Dehradun. The duration of the study was 1 year with follow-up of upto 6 months. All patients admitted in Department of Surgery with diabetic foot were included. Patients with traumatic pathology to bone and soft tissue, suffering from central nervous system diseases as paraplegia, hemiplegia & vascular diseases were excluded. Patients were evaluated by proper history, examination and necessary investigations as per proforma enclosed. Treatment was given as per standard treatment guidelines and the results of treatment were noted. The data collected, was evaluated to see the outcome of treatment.

### OBSERVATIONS AND RESULTS

The total number of patients, admitted in the department of general surgery in one calendar year with lower limb diseases were 226. Out of 226 patients of lower limb disease, 103 (45.6%) patients were diagnosed as soft tissue infections; 49 (21.7%) patients were

diagnosed as diabetic foot; 25 (11.1%) patients were diagnosed as Varicose veins; 23(10.2%) patients were diagnosed as peripheral arterial disease; 18 (7.9%) patients were diagnosed as deep vein thrombosis; 3 (1.3%) patients were diagnosed as non healing ulcer (neuropathic); 2 (0.88%) patients were diagnosed as marjolin ulcer; 1 (0.44%) patient was diagnosed as large keloid; 1 (0.44%) patient had filiriasis and 1 (0.44%) patient had large corn.

Out of 226 patients of lower limb diseases in a calendar year, 49 patients were diagnosed as diabetic foot. Out of 49 patients 39 were males & 10 were female. In diabetic foot, the age of patients ranged from 22 to 86 years. No patient was less than 20 years. 10 (20.4%) patients were between 21 to 40 years; 20 (40.8%) patients were between 41 to 60 years and 19 (38.7%) patients were above 60 years. Majority of the patients with diabetic foot were above 40 years of age.

**Table 1: Age distribution of patients with diabetic foot**

Age(in years)	Diabetic foot (n=49)	Percentage
<20	0	0%
21-40	10	20.4%
41-60	20	40.8%
>60	19	38.7%

Out of 49 patients with diabetic foot, 41 patients were treated by debridement, in which 16 patients had deranged lipid profile and 25 had normal lipid profile.

Out of 49 patients with diabetic foot, 8 patients were treated by amputation, out of which 7 patients had deranged lipid profile and 1 had normal lipid profile. It's significant p value is 0.03 (fisher exact test = 4.519).

Patients with deranged lipid profile had increased chances of amputation.

**Table 2: Distribution of patients according to the treatment and lipid profile**

Treatment ( n=49)	Deranged lipid profile	Normal lipid profile
Amputation (n=8)	7	1
Debridement (n=41)	16	25

Out of 49 patients with diabetic foot, 33 patients had HbA1c more than 8.5 and 16 patients had hba1c <8.5.

Mean hospital stay of patients with hba1c > 8.5 was 10.24 days. Mean hospital stay with hba1c <8.5 was 6days.

Mean serum creatinine of patients with hba1c >8.5 was 1.86 mg/dl. Mean serum creatinine of patients with hba1c <8.5 was 1.19 mg/dl.

The hospital stay and serum creatinine values were significantly higher in patients with hba1c >8.5 (p valve >0.05).

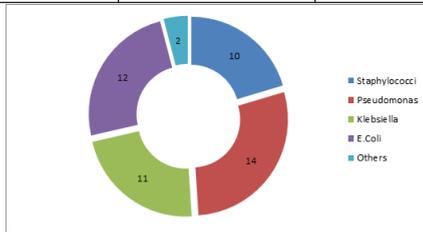
**Table 3: Mean parameters of patient according to HbA1c**

Mean Parameters	HbA1c > 8.5 (n= 33)	HbA1c <8.5 (n= 16)
Mean hospital stay	10.24	6
Mean creatinine	1.86	1.19

Out of 49 patients with diabetic foot; 14 (29%) patients had pseudomonas; 12 (25%) patients had E. Coli; 11 (22%) patients had klebsiella; 10 (20%) patients had staphylococci and 2 (4%) patients had no growth on aerobic culture media

**Table 4: Organisms in diabetic foot**

Organism	Diabetic foot (n= 49)	Percentage
Pseudomonas	14	29%
E. coli	12	25%
Klebsiella	11	22%
Staphylococci	10	20%
No growth	2	4%



**Figure 1: Organisms in diabetic foot**



**Fig 2:- Image showing WAGNER grade 4 ulcer (DIABETIC FOOT)**

**DISCUSSION**

This study was conducted in the Department of Surgery at Shri Guru Ram Rai Institute of Medical & Health Sciences, Dehradun over a period of one year. The study group consisted of 49 patients out of which 39 males and 10 females, which accounted to 79.6% and 20.4% respectively. The greater percentage of males in this study could be attributed to greater outdoor activities.

The maximum number of patients of diabetic foot (40.8%) were in the age group of 41-60 years , followed by >60 years (38.7%) and 21-40 years(20.4%). The least number of patient were in the age group of <20 years (5.8%).

Diabetic foot usually presents as infections, ulcers and charcot foot along with peripheral neuropathy and peripheral arterial disease in diabetic patients. According to a study by Schaper et al and another similar study conducted by Mendes et al diabetic foot remains the single most important precursor for lower limb amputations<sup>8,9</sup>.

The patients with diabetic foot having HbA1c levels> 8.5 showed increased serum creatinine levels and increased duration of hospital stay.

Christman et al demonstrated that patients with HbA1c >7 have poor wound healing as compared to patient with HbA1c <7<sup>10</sup>.

**CONCLUSION**

- In diabetic foot, patients more than 40 years of age (79.5%) are commonly affected.
- Patients of diabetic foot with deranged lipid profile had a higher chance of amputation.
- Patients of diabetic foot with raised HbA1c more than 8.5 had a prolonged hospital stay.
- Patients with diabetic foot who had increased serum creatinine had a prolonged hospital stay.

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