

Original Research Article

Clinical Profile and Outcome of Diabetic Foot in a Tertiary Care Centre

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Abstract

Background: This study attempted to determine the disease burden in terms of clinical profile and outcome of diabetic foot admissions at a tertiary care hospital in a developing country.

Method: This study was done in Department of Surgery at Shri Guru Ram Rai Institute of Medical and Health Sciences and Shri Mahant Indiresht Hospital, Dehradun. Duration of the study was 1 year. The demographic characteristic, type of foot lesion, etiology, isolated micro-organism, treatment, and outcome were reviewed.

Results: A total of 49 patient were diagnosed with Diabetic Foot. All patients had type 2 diabetes with no gender predominance. Majority of the patient were above age of 40 years and diabetes control was very poor. Before admission, the ulcers had already developed for 4.7 ± 2.9 weeks; however, the majority of patients were unaware of the preceding causes. More than 70% of ulcers were in Wagner grade ≥ 3 with infection event in nearly all patients. The most common isolates from culture were Gram-negative bacteria. A total of 8 patient required lower extremity amputations (LEAs) at various level of the foot were carried out, including major LEA.

Conclusions: Diabetic foot problems constitute a source of morbidity, a reason for LEA surgery as well as being a cause of death among patients with diabetes mellitus

Keywords – Diabetic Foot, Clinical Profile, Amputation

Introduction

Patients with lower limb diseases are commonly seen in surgical wards 7% to 10% of hospitalized patients are affected by soft tissue infections in the United States. The most common cause of soft tissue infections is Staphylococcus aureus.¹ Frequently these patients are diabetic, immune compromised, etc. Establishing the diagnosis of Necrotizing Soft Tissue Infection (NSTI) can be the main challenge in treating patients with NSTI, and knowledge of all available tools is the key for early and accurate diagnosis.²

The skin is the largest organ of the body and, with the underlying soft tissue, which includes the fat layers, fascia and muscle, represents the majority of the tissue in the body. It acts as a tough, flexible, structural barrier

to invasion.³ Failure to do so result in an extremely high mortality rate (80 to 100%), and even with rapid recognition and intervention, current mortality rates remain approximately 30 to 50%.⁴

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.⁵ 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%.⁶

Foot problems in diabetics can frequently be life or limb threatening, yet have not received the same level of attention as other diabetes complications.⁷

Our hospital is tertiary care centre in the capital of Uttarakhand state. So this study is undertaken with an aim to evaluate clinical profile and outcome of patients suffering from Diabetic foot.

Aim was to evaluate clinical profile and outcome of patients suffering from lower limb diseases in Department of Surgery at Shri Guru Ram Rai Institute of Medical and Health Sciences and Shri Mahant IndiresH Hospital, Dehradun. Duration of study was 1 year.

Materials and Method

The present study was conducted in the Department of Surgery at Shri Guru Ram Rai Institute of Health and Medical Sciences, Dehradun. The duration of the study was 1 year with follow-up of up to 6 months.

Inclusion Criteria

All patient admitted in Department of Surgery with Diabetes Mellitus having foot problem.

Exclusion Criteria

Patients with traumatic pathology to bone and soft tissue have been excluded

Patients suffering from central nervous system diseases as paraplegia, hemiplegia have been soft tissue infection (non-diabetic) and peripheral vascular disease were excluded.

A written informed consent from the patient was obtained. The study was conducted after approval from the Institutional Ethics Committee.

Patients were evaluated by proper history, examination and necessary investigations as per proforma enclosed. Treatment was given as per standard treatment guidelines and the result of treatment has been noted. The data collected has been evaluated to see the outcome of treatment.

Result

49 patients were diagnosed as diabetic foot. 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 : Organism 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%



Fig 1:- Image showing WAGNER grade 4 Diabetic Foot Ulcer

Discussion

Abbott et al. reported that more than 2% of diabetic patients will develop new foot ulcers annually.⁸ The prevalence of DFU varied between 4% and 20.4% among hospital-based studies in individuals with

diabetes.^{9,10} According to some authorities, diabetic foot problems are responsible for 23–50% of the hospital bed occupancies by diabetic patients.^{11,12}

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.^{13,14}

In our study, majority of patient were of middle-age group. Due to lack of education on nature of illness, they presented to the hospital after 4 weeks after the ulcers had developed. In a study by Lavery et al. duration of ulcers > 30 days was a factor related to development of a wound infection.¹⁵ In our report, infection was present invariably in nearly all patients and Gram-negative bacteria were the most commonly isolated.

With regards to diabetes control, 67.3% of patients had poor glycemic control, i.e. HbA1c > 8.5. For a variety of reasons, good glucose control is not easily obtained in many Indian patients; poor drug compliance, lack of financial resources, and poor access to medical facilities may all compound this problem.¹⁶ Overall mean HbA1c in this study was 11.2%, higher than what Hartemann-Heutier et al. and Ozkara et al. have shown (mean HbA1c 8.7% and 10.3%, respectively).^{17,18} 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 < 7.¹⁹

It was observed that the mean duration of hospital stay for diabetic foot problem was 10.24 days in poor glycemic control patient and 6 days in patient whose HbA1c was less than 8.5%, comparable with Ozkara et al.'s report of an average of 17.2 days. In studies from England, Tanzania, and Nigeria, the mean duration of hospital stay was 22.2, 36.2 days, and 60.3 days, respectively.²⁰⁻²² The variation from study to study might be related to differences in clinical practice, severity of illness, and availability of supportive care in their hospital. However, the relatively lower duration of hospitalization in the present study may be a result of death at early date or discharge from the hospital. Meanwhile, our rate is longer than the reported rate for

patients who routinely examined and attend outpatient diabetic foot service (mean length of stay of only 7.1 days) when hospitalization is required.²³ This is a persuasive argument for the provision of diabetic foot care at a very early stage to reduce both the necessity and length of hospital admission and also improve patient's outcome.

Conclusion

Diabetic foot pathologies are common in diabetics and pose serious health problems for developing countries. They seem to affect both sexes equally. The present study highlights the significance of patients with DFU in tertiary care hospital in India context where diabetes is poorly controlled, there was also little awareness for foot care and delay in seeking treatment, as this will worsens the extent of tissue destruction. Our center is a tertiary referral center in which patients referred have- rather advanced diseases. Many patients fail to receive timely and optimal care once present in the hospital. In the end, Lower Extremity Amputation is a common outcome of Diabetic Foot who are admitted to our hospital, as well as being a notable cause of morbidity and mortality.

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