



TO STUDY THE OVERALL CLINICAL PRESENTATION OF DIABETIC FOOT ESPECIALLY THE VARIOUS PATTERNS IN WHICH A DIABETIC FOOT PRESENTS

General Surgery

Farooq Ahmad Mir Senior resident, Department of surgery, GMC, Anantnag Kashmir

Shaughta Aara* Senior resident, Department of surgery, GMC, Anantnag Kashmir. *Corresponding Author

Khalida Musthaq Consultant, Department of Anaesthesiology, GMC, Anantnag Kashmir

ABSTRACT

Diabetes mellitus has become an epidemic worldwide. Depending on etiology of diabetes mellitus, factors contributing to hyperglycemia may include reduced insulin secretion, decreased glucose usage and increase glucose production. Material and Methods. All patients underwent detailed history and clinical examination. Patients that entered the study were followed for ulcer recurrence, healing time and many other related complications. Follow up was not stopped at the end of the study and some patients continued to follow after the end of the study period. Written consent was obtained from all patients. Data was tabulated in Mean $\pm$ SD, frequency and percentage. All the analysis was done by using software package SPSS-22. Conclusion. Most common history of presentation in the present study was foot abscess in 29% of patients followed by foot ulcer and gangrene in 22% and 20% patients respectively. Most common site of foot ulcer/ abscess were toes in 33% of patients followed by planter aspect of foot in 32% of patients in the studied subjects.

Introduction.

Diabetic foot ulcer is a rising health problem with increasing prevalence of diabetes. It is the most important cause of non-traumatic foot ischemia.¹

Among the various complications of diabetes mellitus lower extremity complication i.e. diabetic foot ulcer is a major cause of morbidity and lower extremity amputation. Foot lesions associated with diabetes are grouped and known as diabetic foot². Consequently, foot disorders are one of the leading causes of hospitalization for persons with diabetes and account for a lot of costs to health care system.³ Diabetic patients have up to a 25% life time risk of developing a foot ulcer.⁴ Various risk factors associated with increased chance of development of diabetic foot disease are: older age, male sex, duration of diabetes more than 10 years, structural foot deformities, history of previous ulcer, peripheral neuropathy, peripheral vascular disease, nephropathy, retinopathy, poor glycemic control, smoking & poor socioeconomic status. Diabetic foot ulceration results from the simultaneous action of multiple contributing causes.⁵ The major contributing causes are noted to be peripheral neuropathy, ischemia from peripheral vascular disease (PVD) and immune deficiency.⁶

More than 60% of diabetic foot ulcers are the result of underlying neuropathy. The development of neuropathy in affected patients has been shown to be a result of hyperglycemia induced metabolic abnormalities.⁷ One of the commonly described mechanism of action is the polyol pathway. In the development of neuropathy, the hyperglycemic state leads to an increase in action of the enzymes aldose reductase and sorbitol dehydrogenase. This results in conversion of intracellular glucose to sorbitol and fructose. The accumulation of these sugar products results in a decrease in synthesis of nerve cell myoinositol, required for normal nerve conduction. Additionally, the chemical conversion of glucose results in depletion of nicotinamide adenine dinucleotide phosphate (NADPH) stores which is necessary for the detoxification of reactive oxygen species and for the synthesis of vasodilator nitric oxide (NO). There is a resultant increase in oxidative stress on the nerve cell and an increase in vasoconstriction leading to ischemia which will promote nerve cell injury and death. Hyperglycemia and oxidative stress also contribute to the abnormal glycation of nerve cell proteins and inappropriate activation of protein kinase C, resulting in further nerve dysfunction and ischemia.

Materials and methods.

This prospective study was conducted in the department of Surgery GMC Anantnag Kashmir. A total of 50 patients having diabetic foot ulcer were included in the study. The study period was 6 months from Feb 2018 to July 2018. All patients underwent detailed history and clinical examination. Patients that entered the study were followed for ulcer recurrence, healing time and many other related complications. Follow up was not stopped at the end of the study and some patients continued to follow after the end of the study period. Written consent was obtained from all patients.

Age, sex, type of diabetes, duration of diabetic illness, cause of ulceration, size, shape and depth of ulceration, presenting signs and symptoms of ulceration, history of smoking, hypertension, history of previous surgery (debridement), information about foot wear, drug history, previous history of ulceration. A detailed foot examination was performed and ulcers were classified according to Wagner's classification. Swab samples were collected for microbial culture and antibiotic sensitivity. A specially designed proforma was considered for this purpose. Blood was collected for clinical investigations which included complete blood count (CBC), kidney function tests (KFT), liver function tests (LFT) and blood sugar was done in each patient at the time of admission.

Wagner's classification of diabetic foot ulcer was used to classify the foot lesions.

Grade 0: Intact skin with bony deformities that produces a foot at risk.

Grade 1: Localized superficial ulcer.

Grade 2: Deep ulcer up to tendon, bone, ligament or joint.

Grade 3: Deep abscess, osteomyelitis.

Grade 4: Gangrene of forefoot or hind foot.

Grade 5: Gangrene of entire foot.

Data was tabulated in Mean $\pm$ SD, frequency and percentage. All the analysis was done by using software package SPSS-22.

DISCUSSION

Our study comprised of 50 patients with diagnosis of diabetic foot. Wagner's classification of diabetic foot ulcer was used to grade foot ulcers from grade 0 to grade V.

The data revealed that diabetic foot disease affected males somewhat more frequently than females. 95 (63%) were males and 55 (37%) were females with a male to female ratio of 1.7:1. The age ranged from 30 to 75 years and the mean age was 67.5 years. This is in accordance with the study conducted by Annelie Kerekou Hode et al, in which mean age of patients was 58.05 years $\pm$ 10.65 years, ranging from 35 years to 70 years and the sex ratio was 1.5:1.⁸

Type II Diabetes was found in 93% of patients and type I in 7%. This is in concordance with the study conducted by Phillip L Chalya et al, in which majority of patients (95.5%) had type II diabetes mellitus.⁹

Predominantly in this study, the right foot was affected more than the left foot, percentage being 57% and 33% respectively. As many as 10% patients had involvement of both feet. Similar results were observed in the study conducted by Siddhartha Jain et al, in which right foot was involved in 58% of patients, left foot was involved in 35% of patients and involvement of bilateral feet was observed in 7% of patients.¹⁰

About 75% of patients were in the 5th and 6th decade of life. Patients with age more than 40 years constituted 90% of the diabetic foot patients with maximum brunt born by 51 to 60 years (42%). Rajkumar Sade et al, observed similar results in which the most common age group with diabetic foot ulcer was 40-60 years.¹¹

In the present study, the mean duration of diabetes mellitus was 8 years ranging from less than a year to more than 15 years, with 7 patients having less than one-year (newly diagnosed) duration of diabetic illness. This is in accordance with a study conducted by Siddharth Jain et al, in which the mean duration of diabetes was 8.2 years and 5 patients were newly diagnosed diabetic patients.¹²

Among the risk factors smoking and hypertension was present in around 60% of patients. History of improper footwear and barefoot walking was present in around 33% of patients. 26% of patients had diabetes of more than 10 years duration. Foot deformities were present in around 25% of patients. This is in accordance with the known risk factors of diabetic foot ulcer.¹³

Conclusion.

- The findings of present study indicate that males were affected more as compared to females.
- The age ranged from 30 to 75 years and the mean age was 67.5 years.
- About 90% of the patients in this study had type II diabetes mellitus and only 10% patients were having type I diabetes mellitus.
- Involvement of right foot was seen in 57% of patients and about 10% had involvement of both feet.
- Majority of patients (75%) in the present study were in the age group of 40-60 years.
- Majority of patients had Grade III and Grade IV Wagner's foot ulcers and were seen in almost 60% of patients.
- Almost 70% of the patients in the present study were having duration of diabetes ranging from 6- 15 years.
- Majority of males had higher Wagner's grade of ulcer at the time of presentation as compared to females.
- Risk factors like hypertension, smoking and duration of diabetes of more than 10 years were present in majority of the patients. Most common history of presentation in the present study was foot abscess in 29% of patients followed by foot ulcer and gangrene in 22% and 20% patients respectively.
- Most common site of foot ulcer/ abscess were toes in 33% of patients followed by planter aspect of foot in 32% of patients in the studied subjects.

References

1. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes, estimates for the year 2000 and projections for 2030. *Diabetes care* 2004; 27:1047-53.
2. Chary AY in clinical and operative surgery 2nd edition 2002; page 967.
3. Robert G. Fryberg, et al. Diabetic foot disorders: A Clinical Practical Guideline page 3. For the American College of Foot and Ankle Surgeons.
4. Singh N, Armstrong DG, Lipsky BA. Preventing foot ulcers. Armstrong DG, Lavery LA: Diabetic foot ulcers: prevention, diagnosis and classification. *Am Fam Phys* 57:6:1325-1332, 1337-1338, 1998.
5. Kelkar P: Diabetic neuropathy. *Sem Neurol* 25:168-173, 2006.
6. Bowering CK: Diabetic foot ulcers: pathophysiology, assessment, and therapy. *Can Fam Phys* 47:1007-1016, 2001.
7. Zochdone DW, Diabetic polyneuropathy: an update. *Curropin Neurol* 21:527-533, 2008
8. Annelie Kerekou Hode, François Djrolo, Daniel Amoussou-Guenou Epidemiological and Clinical Features of Diabetic Foot in Cotonou *Journal of Diabetes Mellitus* Vol.05 No.03(2015), Article ID:58620, 7 pages.
9. Phillipo L Chalya, Joseph B Mabula, Ramesh M Dass, Rodrick Kabangila, Hyasinta Jaka, Mabula D Mchembe. Surgical management of Diabetic foot ulcers: A Tanzanian university teaching hospital experience. *BMC Res Notes* vol.4; 2011.
10. Siddharth Mohanlal Jain, Tejinder Chhabda. Surgical Management of Diabetic Foot Ulcers: Experience In MGM Medical College And Hospital, Aurangabad. *Inter Jour of Innovative Research and Advanced Studies: Volume 3 Issue 11, October 2016.*

11. Rajkumar Sade, Dasharadha Jatothu, Taruni, Kirthana Sade, Nagababu Pyadala. Management of diabetic foot ulcers in a teaching hospital. *Int Surg J*. 2017 Sep; 4(9):3088-3091.
12. Alvin C. powers; diabetes mellitus; in Harrison's principles of Internal Medicine page 2190- 2 Ankle 1981; 2: 64-122.
13. Frykberg RG, Diabetic foot ulcers: current concepts. *J Foot Ankle Surg.* 1998; 37:440-462 10(15th Ed), 2001.