

Clinical Profile of Patients with Diabetic Foot

Pramod*, Sandeep Patil**

*Assistant Professor, Dept.of General Surgery, Gulberga Institute of Medical Sciences, Kalburgi. **Assistant Professor, Dept.of General Surgery, JNMC, Belgaum.

Abstract

Introduction: Diabetic foot disease is a serious medical, social and economic problem and it continues to be a prominent area of discussion and research. It is a major cause for morbidity, which may lead to amputation of the foot. In developed countries, it has been estimated that 20% of all diabetic admissions to the hospital are due to foot problems and 5 out of 6 major amputations are due to diabetic foot disease.

Methodology: A detail history of all the patients were taken, relevant investigations were performed, special attention is taken for estimation of Glycosylated Hemoglobin level in all patients. All operative and medical management findings were noted and patients were followed up at intervals. All the data received during this procedure are placed in a special pro-forma that is prepared for the said purpose.

Results: Among the 50 patients of diabetic foot 2 cases (4%) were Grade I, 3 cases (6%) were Grade II, 8 cases (16%) were Grade III, 36 cases (72%) were Grade IV, 1 case (2%) under Grade V and no cases were recorded under Grade 0.

Conclusion: Ulceration and infection of the diabetic foot poses a big problem with regard to bed occupation in surgical wards owing to longer duration of stay.

Keywords: Diabetic Foot; Ulcer; Clinical Profile.

Introduction

Diabetes is a worldwide problem. A majority of diabetic patients develop foot ulcers at one point of time or other during the course of their illness. A significant number of such patients will require long-term hospital treatment and amputations. The etiopathogenesis of diabetic foot lesions are multifactorial. Diabetic neuropathies, vasculopathy, poor control of diabetes and bacterial infection are some of them [1].

Foot is the most vulnerable part of body for injury and infection as neglected by patients. These facts coupled with the common practice of barefoot walking and paucity of patient education programmes makes it likely that a significant proportion of diabetics are susceptible to these complications. The site of preference is the foot for neuropathy and ischaemia. Diabetes is one of the major problems of this generation with worldwide dimension [2].

Diabetic foot disease is a serious medical, social and economic problem and it continues to be a prominent area of discussion and research. It is a major cause for morbidity, which may lead to amputation of the foot. In developed countries, it has been estimated that 20% of all diabetic admissions to the hospital are due to foot problems and 5 out of 6 major amputations are due to diabetic foot disease [3].

Fifteen percent of diabetics will develop a foot ulcer in their lifetime. Fifteen to twenty percent of such foot ulcers will ultimately need an amputation and it is estimated that 85% of major lower limb amputations are preceded by an ulcer.

Corresponding Author: Pramod, Assistant Professor, Department of General Surgery, Gulberga Institute of Medical Sciences, Kalaburagi - 585101, Karnataka.
E-mail: pramoddr2012@gmail.com

Received on 06.01.2017, Accepted on 10.01.2017

Glycated hemoglobin (glycosylated hemoglobin, hemoglobin A1c, HbA1c, A1C, or Hb1c; sometimes also HbA1c) is a form of hemoglobin which is measured primarily to identify the average plasma glucose concentration over prolonged periods of time. It is formed in a non-enzymatic glycation pathway by hemoglobin's exposure to plasma glucose. Normal levels of glucose produce a normal amount of glycated hemoglobin. As the average amount of plasma glucose increases, the fraction of glycated hemoglobin increases in a predictable way. This serves as a marker for average blood glucose levels over the previous months prior to the measurement [4].

In Diabetes mellitus, higher amounts of glycated hemoglobin, indicating poorer control of blood glucose levels, have been associated with cardiovascular disease, Nephropathy, and Retinopathy. Monitoring the HbA1c in type-1 diabetic patients may improve treatment. Research has proven that good control of diabetes is the best way to prevent or delay complications of the disease, complications that include heart disease, blindness, nerve damage and kidney damage. While your daily blood testing tells you how your blood sugar is doing right then, allowing you to make necessary changes in medicine, food and exercise, it doesn't give you a picture of your long-term diabetes management success. To do that, there is glycosylated hemoglobin testing [5].

Sugar that is not used for energy is left in the blood, where it attaches itself to the hemoglobin, which is

the part of the red blood cell that carries oxygen, in a process called glycosylation. The more glucose there is in the bloodstream, the more glucose builds up in the cells. This binding of sugar to molecules in cells is one way diabetes causes physical damage and health problems.

Methodology

Inclusion Criteria

- All the patients with Diabetes Mellitus presenting with foot ulcers, infection of foot and gangrene of foot.

Exclusion Criteria

- Non diabetic ulcer
- pediatric age group

A detail history of all the patients were taken, relevant investigations were performed, special attention is taken for estimation of Glycosylated Hemoglobin level in all patients. All operative and medical management findings were noted and patients were followed up at intervals.

All the data received during this procedure are placed in a special pro-forma that is prepared for the said purpose.

Results

Table 1: Age incidence

Age in years	No of cases	Percentage (%)
<40	5	10
40-<50	11	22
50-<60	26	52
60&above	8	16
I Total	50	100

In the present series highest number of cases were recorded in the 5th and 6th decade of life.

The disease was common in male and out of 50 cases there were 41 males (82%) and 9 females (18%)

with a male female ratio 4.55:1.

In the present study 48 (96%) patients had type II diabetes mellitus out of 50 patients, the other 2 had type I diabetes.

Table 2: Sex distribution

Sex	No of Cases	Percentage (%)
Male	41	82
Female	9	18
Total	50	100

Table 3: Duration of diabetes mellitus

Duration (years)	No of cases	Percentage (%) 1
<1yr.	2	4
1 – 4yrs.	11	22
5 – 8yrs.	14	28
9 – 12yrs.	20	40
13 – 16yrs.	2	4
17 – 20yrs.	1	2
Total	50	100

Table 4: Mode of onset

History	No of cases	Percentage (%)
History of Trauma	48	96
Spontaneous	2	4
Total	50	100

The incidence of diabetic foot gradually increases with the duration of diabetes, most of the patients having duration of 9-12 yrs. history of diabetes in the present series.

Most of the cases were presented with history of

minor trauma. The mode of onset was traumatic in 48 cases (96%) and spontaneous in 2 cases (4%).

In this series the socio-economic status of the cases was recorded as lower class in 37 patients (74%) and lower middle class in 13 cases (26%).

Table 5: Occupation

Occupations	No of Cases	Percentage (%)
Cultivator	33	66
Daily wage labour	5	10
Housewife	9	18
Retired civil servant	3	6
Total	50	100

Table 6: Site of ulceration in the foot

Site	No of cases	Percentage (%)
Toe	18	36
Ball of foot	15	30
Heal	4	8
Others	13	26
Total	50	100

Out of 50 cases there were 33 cultivators (66%), 5 daily wage labour (10%), 9 house wives (18%) and 3 retired civil servants (6%).

In the present series the maximum site of involvement was found to be forefoot. There were 18 patients (36%) having ulceration in the over toe, 15 cases (30%) over ball of the foot, heal involved in 4

cases (8%) and others (Dorsum of foot etc.) in 13 cases (26%).

In the present series the right foot was the predominant side of involvement. There were 33 patients (66%) having right foot ulceration and 13 patients (26%) in the left foot and bilateral in 4 cases(8%) with R:L ratio 2.5:1.

Table 7: Incidence of peripheral neuropathy and peripheral vascular disease

	No of cases	Percentage (%)
Peripheral neuropathy	38	76
Peripheral vascular disease	2	4
Both	0	0
None	10	20
Total	50	100

In this study peripheral neuropathy was significantly common as an individual risk factor in patients with diabetic foot. Peripheral neuropathy

was present in 38 cases (76%), peripheral vascular disease was present in 2 patients (4%) only and none in 10 cases (20%).

Among the 50 patients of diabetic foot 2 cases (4%) were Grade I, 3 cases (6%) were Grade II, 8 cases (16%) were Grade III, 36 cases (72%) were Grade IV I case (2%) under Grade V and no cases were recorded under Grade 0.

The presenting symptoms of the cases were gangrene in 29 cases (58%), Gangrene with abscess in 5 cases (10%), abscess alone in 8 cases (16%), ulceration in 8 cases (16%).

Table 8: Grade of wound

Grade	No of cases	Percentage (%)
0	0	0
1	2	4
2	3	6
3	8	16
4	36	72
5	1	2
Total	50	100

Table 9: Incidence of symptomatology

Symptoms	No of cases	Percentage (%)
Gangrene	29	58
Gangrene with abscess	5	10
Abscess	8	16
Ulcer	8	16
Total	50	100

Discussion

In the present series of 50 cases, the youngest patient was a female of 26yrs and oldest one was a male of 65 yrs. The average age in the series was 49.6 yrs. In the study of 39 cases, William et al [6] (1990) reported the average age of 67 (51-86) years. Pecoraro et al [7] (1990) in their study of 80 cases reported the average age of 63.4 (30-85) years. In the study of Deerochanawang et al [8](1992) in Tyne hospitals, Newcastle the average age reported was 68.7 (57-81) years.

In this series of 50 cases, males are more commonly affected than females with a male to female sex ratio of 4.55:1. William et al (1990) in their study of 39 cases reported that the males are more commonly affected than the females with a male to female sex ratio of 1.4:1. Deerochanawang et al (1992) in their study from Newcastle reported the male to female sex ratio of 3:1.

In this series, type 2 diabetes was the predominant type which matches with the other studies also. The duration of diabetes in our study group ranges from <1 -20 yrs with an average duration of 6.9 yrs. The lowest duration of diabetes in this study was 6month and maximum duration was 18yrs. William et al (1990) in their study of 39 cases from Nottingham reported the average duration of 5 years with the range of duration of diabetes from 0–25 years. Pecoraro et al (1990) in their study of 80 cases from Seattle reported the range of duration of diabetes from 0–25 years, the average duration being 13.3 years.

Deerochanawang et al (1992) in their study of 48 cases from New castle reported the average duration of 7 years with the range of duration of diabetes from 0–27 years. Duration of diabetes >10 years has been mentioned as risk factor for foot ulcer.

In the present series, the fore foot (toe, ball of foot) was the common site of ulceration. In a comparative study of diabetic foot ulcer classification system, the site of ulcer found to be 77.8% in forefoot, 11.9% in midfoot and 10.3% in hindfoot . Gayle E Reiber et al (2001) [9] found ulcer sites to be toes in 25.3% cases, midfoot in 30.8% cases, heel in 6.6% cases. In the present series toes involved in 36% cases, ball of foot in 30% cases 1 heel in 8% cases and others (dorsum of foot) in 26% cases.

In the present series, 48 cases (96%) presented with history of minor trauma. Pecoraro et al (1990) in their study of 80 cases from Seattle reported 81% cases are due to initial trauma. Reiber et al (1992) [10] in their study reported 77% cases are due to minor trauma. Minor trauma contributes to the occurrence of foot ulcers and may lead to foot ulceration in absence of other risk factors.

Conclusion

Diabetic foot is a common health problem in this region. Males of 6th decade are more frequently affected with predominantly type II diabetes mellitus with poor glycaemic control i.e raised HbA1c level.

References

1. Franklin GM, Kahn LB, Baxter J, Hamman RF. Sensory neuropathy in non-insulin dependent diabetes mellitus. The San Luis Valley Diabetes Study. *Am. J. Epidemiol.* 1990; 131:633-643.
 2. American Diabetes Association. Foot care in patients with diabetes mellitus. *Diabetes Care* 1993; 14(Suppl. 2):19-20.
 3. Bloomgarden Z.T. American Diabetic Association 60th Scientific sessions, 2000. The diabetic foot. *Diabetes care*, 2001; 24:946-951.
 4. Dronge A S, Perkal M F, Kanier s et al (VA Connecticut Health care System, West Haven, iyaleuniv, West Haven Conn); *Arch surg* 2006; 141:375-380.
 5. Harris M, Klein R, Welborn TA, Khuiman MW: Onset of NIDDM occurs at least 4-7 years before clinical diagnosis. *Diabetes Care* 1992; 15:815-819.
 6. William et al. Foot ulcers in previously undiagnosed diabetes mellitus. *But. Journal of Med.*; 1990; 300:1046-1047.
 7. Pecoraro R.E., Reiber G.E., Burgess E.M., Pathways to diabetic limb amputation: basis for prevention. *Diabetes Spectrum* 1990; 5:329-334.
 8. Deerochanawong et al. A survey of the lower limb amputation in diabetic patients. *Diabetic Med.* 1992; 9:942-946.
 9. Gayle F Reiber, Douglas G Smith, Edward J Boyko et al. A comparison of diabetic foot ulcer patients managed in VHA and NON-VHA settings; *Journal of rehabilitation research and development*, 2001; 38(3).
 10. Reiber GE, Boyko EJ, Smith DG. Lower extremity foot ulceration and amputations in diabetes. *Diabetes in America*, 2nd Ed. Bethesda, MD: National Institutes of Health, 1995.p.409-428. NIH publication No. 95-1468.
-