



CLINICAL AND MICROBIOLOGICAL PROFILE OF PATIENTS WITH DIABETIC FOOT ULCER IN A SOUTH INDIAN TERTIARY CARE CENTER

Dr. Sundaram. R	M.D. Associate professor, Government thiruvavur medical college, Thiruvavur
Dr.Dinesh.R*	Post graduate in Internal medicine Department of internal medicine Madurai medical college Madurai *Corresponding Author
Dr.Sridhar.S	Post graduate in Internal medicine Department of internal medicine Madurai medical college madurai

KEYWORDS :

INTRODUCTION:

India is the diabetes capital of the world with over 30 million patients. One of the most common chronic complication of diabetes affecting about 15% of diabetics. The occurrence of diabetic foot also increases the socioeconomic burden on the patient. Diabetic foot is the result of triad of neuropathy, vasculopathy and infection. The ulcers are most common on the pressure point in the foot. They are also the ideal site of infections to occur. So a clinical profile will help in preventing diabetic foot and the microbiological profile in treatment of the ulcer and preventing morbidities.

Materials and methods:

150 patients with diabetic foot ulcer admitted in our hospital were included in study. Patient's history was taken regarding duration of diabetes, hypertension and other morbidities. Patients fasting post prandial blood sugar, renal function test, urine albuminuria (dipstick method), HbA1c, ABPI (ankle brachial pressure index) and culture and sensitivity from the ulcer were analysed.

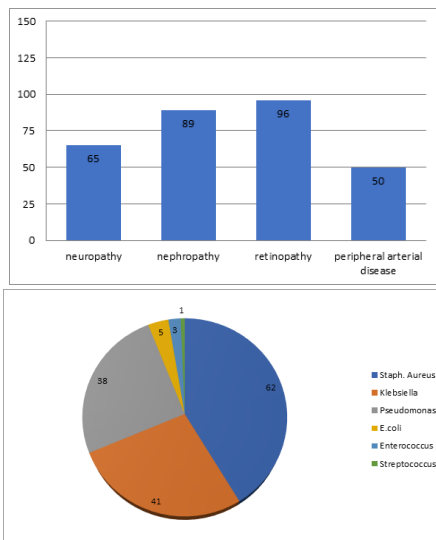
Results:

Among the 150 patients 102 had hypertension, 112 had dyslipidemia, 72 had CAD, and 30 had chronic kidney disease. The average duration of diabetes was 12 yrs. The mean age of presentation is about 62 yrs.

About 82 (54%) had BMI >24. Male predominance was seen in foot ulcers (66%).

Of the 150 patients 43% had peripheral neuropathy, 89% had nephropathy and 64% had retinopathy. ABPI was less than 0.8 in about 50% of patients. The mean HbA1c was 11.2. Patients with CKD tend to have more severe grade of ulcer.

The most common organism was Staphylococcus aureus followed by klebsiella, pseudomonas and E. coli.



DISCUSSION:

Diabetic foot ulcer is common complication of diabetes mellitus. It increases the morbidity and economic burden (1) of the patient. The triad of vasculopathy, neuropathy and trivial trauma leads to diabetic foot ulcer. The blood circulation to the wound may be reduced by vaso-occlusion due to microangiopathy, vasoconstriction due to autonomic neuropathy and the sensory loss further adds oil to the pyre.

Neutrophil chemotaxis, neutrophil adherence to vascular endothelium, phagocytosis, intracellular bactericidal activity, opsonization and other aspects of innate immunity are all reduced in diabetics with hyperglycemia. Adaptive immunity appears relatively unaffected. The advanced glycation products seem to be the cause of the impairment. The hyperglycemia diverts the NADPH for super oxide formation to polyol pathway (2). The impairment of chemotaxis and phagocytosis seem to play a role in Staph. aureus infections. Diabetics also have a predisposition to acquire Klebsiella infections.

The mean age of presentation was 62 yrs which also consistent with other studies in south India (3,4)

Our study showed a male predominance and higher BMI in diabetic foot ulcer patients as seen in other studies. The male predominance may be due to the increased exposure to environmental factors. The increased BMI (5) may contribute to ulcer due to increased load on pressure points and also reduced self care.

The patients with diabetic foot tend to have higher HbA1c. The reverse may be true as higher HbA1c can cause the complications leading to development of diabetic foot. In our study patients had a mean HbA1c of 10.2 gm/dl which was higher than those observed in other studies in world (6) but similar to those in south India (4).

The frequently associated complications were diabetic neuropathy, nephropathy, vasculopathy and retinopathy. The presence of neuropathy and vasculopathy contribute to the occurrence and also chronicity of diabetic foot ulcer. The occurrence of foot ulcer tends to be lower in Asians than Europeans (6).

The presence of nephropathy can aggravate the atherosclerotic process leading to increased vasculopathy and also tends to increase incidence of neuropathy.

The presence of retinopathy per se indicates poor glycemic control and these patients are at increased risk for foot ulcers. This is mainly by two factors, viz. similar contributing factors for diabetic neuropathy and retinopathy and patients with reduced vision are more prone to get traumatized and also cannot appreciate minor damages during self examination thereby unable to prevent formation of callus and then ulcers.

Infection in the ulcers in order from most common were Staph. aureus, klebsiella, Pseudomonas and E. coli. Our institution had a higher prevalence of klebsiella infection when compared to other studies in the south Indian region (8). The most common infection remains Staph. aureus.

Conclusion:

Prevention is better than cure. Simple techniques like daily foot examination, appropriate footwear, hygiene and most importantly adequate glycemic control can help mitigate the damage of diabetic foot. On the part of the treating physician identification of early neuropathy by monofilament test, Peripheral arterial disease and adequate education of the patient can prevent the dreaded complication. And awareness of the pattern of infection and the sensitivity patterns can help in choosing antibiotics and this study serves this very purpose.

References:

- 1) Shobhana R, Rama Rao P, Lavanya A, Vijay V, Ramachandran A. Cost burden to Diabetic patients with foot complications- a study from Southern India. JAPI 2000;48:12.
- 2) Mazade MA, Edwards MS. Impairment of type III group B streptococcus - stimulated superoxide production and opsonophagocytosis by neutrophils in diabetes. Mol Genet Metab 2001; 73: 259-267.
- 3) Clinical profile of diabetic foot infections in south India--a retrospective study. Vijay V1, Narasimham DV, Seena R, Snehalatha C, Ramachandran A. Diabet Med. 2000 Mar;17(3):215-8.
- 4) The Diabetic Foot: Perspectives From Chennai, South India Vijay Viswanathan The International Journal of Lower Extremity Wounds Vol 6, Issue 1, pp. 34 - 36
- 5) Sohn, M., Budiman-Mak, E., Lee, T. A., Oh, E. and Stuck, R. M. (2011), Significant J-shaped association between body mass index (BMI) and diabetic foot ulcers. Diabetes Metab. Res. Rev., 27: 402-409. doi:10.1002/dmrr.1193
- 6) Christman AL, Selvin E, Margolis DJ, Lazarus GS, Garza LA. Hemoglobin A1c is a Predictor of Healing Rate In Diabetic Wounds. The Journal of investigative dermatology. 2011;131(10):2121-2127. doi:10.1038/jid.2011.176.
- 7) Chaturvedi N, Abbott CA, Whalley A, Widdows P, Leggetter SY, Boulton AJ. Risk of diabetes-related amputation in South Asians vs Europeans in the UK. Diabet Med 2002;19:99-104.
- 8) Clinical and microbiological profile of diabetic foot ulcer patients in a tertiary care hospital. Kateel R1, Augustine AJ2, Prabhu S2, Ullal S3, Pai M2, Adhikari P4. Diabetes Metab Syndr. 2018 Jan - Mar;12(1):27-30. doi: 10.1016/j.dsx.2017.08.008. Epub 2017 Aug 26.