Tripolitana Medical Journal; 2015, Vol. 4, No. 2, pp. 71 - 73

Research Article

ISSN 2077-5628

Surgical Management of Diabetic Foot Syndrome: A Retrospective Study

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Received 20 July 2015/Accepted 10 October 2015

ABSTRACT

Diabetes mellitus is a chronic disorder characterized by impaired metabolism of glucose and it has many complications affecting the micro vascular level of the eye and kidneys and a variety of clinical neuropathy. It is associated with premature macro vascular diseases such as myocardial infarction and stroke, and peripheral vascular complications leading to ischemia and necrosis with putrefaction of the lower limbs.

The objective of this study is to describe the clinical, pathophysiological findings and surgical management of diabetic foot and how we can improve our outcomes and develop a guideline for the management of diabetic foot. It is a retrospective study of data on a total number of 33 patients admitted to Breast and Endocrine Department at Tripoli Medical Center over a one year period (from first of January 2014 to thirty one of December 2014).
We conclude that diabetic foot syndrome is a major complication of non-controlled diabetes mellitus which can be prevented by education and proper management of diabetes mellitus. Amputation can be minimized in diabetic patients by controlling blood sugar level, along with the administration of antibiotic and Debridement. Meropenem (Meronem) was found to be more effective than any other antibiotics used in our study in treating diabetic foot syndrome.

Keywords *- Diabetes mellitus; Foot complications; Surgical Managements.*

INTRODUCTION

Diabetes mellitus is a chronic disorder characterized by impaired metabolism of glucose and by complication that include micro vascular disease of the eye and kidneys and a variety of clinical neuropathy.[1] Diabetes is also associated with premature macro vascular diseases such as myocardial infarction and stroke, and peripheral vascular complications such as amputation. The world Health Organization (WHO) expert committee on diabetes[2] defined diabetes mellitus as a state of chronic hyperglycemia which may result from several interacting and environmental processes. Mortality in diabetes is 42%.[3] Macro vascular complication are the major cause of mortality in patients with diabetes milletus.[3-5]Foot complications occur in both forms of diabetes and are related more to the period of time that the illness has been present than to the age of onset.[6] Foot complications now constitute a major public health problem for diabetic patients in various African countries. Foot complication in African patients are generally infective in origin rather than due to peripheral vascular disease.[7,8] Foot ulcers are common in the older diabetics and community surveys have shown that 15% will develop a foot ulcer at some point in their lives.[9-11]

The purpose of this study is to describe the clinical, pathophysiological findings and surgical management of diabetic foot to compare it with other studies and how we can improve our outcome and develop our guidelines for the management of diabetic foot.

MATERIALS AND METHODS

A retrospective study of data on a total number of 33 patients admitted to the Breast and Endocrine Department at Tripoli Medical Center and treated with a collaboration of consultants from the Department of Medical endocrine at Tripoli Medical Center over a one year period (from 1st January 2014 to 31 December 2014) was conducted. The study included: demographic distributions, age, sex, race, type of diabetes, type of diabetic foot pathology, line of management, duration of hospital admission, HbA1c, Doppler ultrasound, result of the swab and culture and sensitivity random and fasting blood sugar level, medical and surgical management.

RESULTS

A total number of 33 patients admitted to the Endocrine and Breast Department at Tripoli Medical Center over a one year period (from 1stJanuary 2014 to 31 December 2014) was studied and only 11 of the cases were found to have complete files .After analysis of the data it was found that all subjects had type II diabetes mellitus and that male patient diagnosed with diabetes milletus were more than female by a ratio of (7:4).

The age of patients ranged between 43 to 80 years with a mean of 62 years. The time period the patients had suffered

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from diabetes ranged from15 to 40 years and the duration of hospital admission was 3 to 55 days with a mean of 27 days. At the time of admission all patients had the symptoms and signs of inflammation including (swelling, hotness, tenderness and loss of function's) with discharge and pus collection. Blood pressure was controlled in3 patients, 3 cases were hypertensive, and 5 cases were hypotensive .

Analysis of HbA1c showed a mean result of 8% with7 cases > 10%, one patient < 6%, and the remaining 3 patients had no results.

Doppler ultrasonography was performed on 7 of the subjects and showed one case to have weak blood flow, one case with severe calcified stenosis of both the anterior and posterior tibial arteries, and 5 cases showed normal blood flow.

Culture and sensitivity tests were performed many times on the patients during their stay in the hospital and a total of 5 types of bacterial pathogens, mostly Gram positive, were found in the culture which were: *Escherichia coli, Proteus mirabilis, Pseudomonas aeruginosa, Enterococcus faecalis, and Klebsilla*. Culture and sensitivity tests revealed 5 cases with mixed heavy growth of *Escherichia coli* and *Proteus mirabilis* which were sensitive to Ceftriaxcin, 2 cases with *Pseudomonas aeruginosa* and *Enterococcus faecalis* which were sensitive to Meropenem, 3 cases with *Pseudomonas aeruginosa*, *Proteusmirabilis* and *Enterococcus faecali* which were sensitive to Meropenem as well, and one case with *Enterococcus faecalis* and *Pseudomonas aeruginosa* which was sensitive to Ciprofloxacine. The result of one the culture was *Pseudomonas aeruginosa* which was sensitive to Doxycycline and two culture there were *Klebsilla* sensitive only to Meropenem.

All the patients in this study were found to be anemic with haemoglobin levels ranging between (9-13.3) with a mean value of 11.19 mg/dl. Other parameters measure such as fasting blood sugar were found to be between (81-304 mg/dl) with a mean value of 208 mg/dl and the random blood sugar ranged between (81-451) with a mean value of 266 mg/dl.

In relation to foot complications, 6 cases were affected in their left foot whereas the remaining 5 cases were affected in their right foot. Partial amputation was performed on 8 cases with 4 of the partial amputations carried out on the left foot and 4 on the right foot. Furthermore, incisional and drainage was performed on 2 cases.

Treatment was initiated by controlling blood sugar levels and using a broad spectrum antibiotic such as Rocephine at the time of admission until being substituted by the appropriate antibiotic as determined from the results of the culture and sensitivity tests. From this study it was found that 4 cases out of 11 cases when treated with Meropenem, had a good response with minimal surgical intervention and a short stay in the hospital in comparison with the other 7 cases who treated by other antibiotics such as Augmentin, Clarithromycin, Gentamycin, Ceftriaxone, Cloxaciline, Penicillin, Metranidazole, Ciproflxacilin, and Vancomycin.

DISCUSSION

The fundamental cause of lower extremity complications in diabetes is chronic hyperglycemia leading to hyper glycosylation of the various body tissues. HemoglobinA1c is a molecule. It is probably the most readily recognized example of hyper glycosylation in diabeteshemoglobin A1c is used to measure blood glucose control during an extended period e.g., several weeks.[12]

The predominant of type II diabetes in patients suffering from diabetic foot is: Type I:Type II in different studies being 0.12,[13] 0.023[14] and 0.19.[15] All the cases in present study were type II. The late middle-age group is naturally more liable to diabetic complication because of longer duration of the disease.[16] The male preponderance is also reported in literatures[16-17], the ratio between male: female was 3:8 1:8 and while in Libya male: female ratio was 3:1.[18] In other study in Libya male: female ratio was 1:1.2.[19] In this study male are more than female the ratio was 2:1.7.

Basic principles of wound care including surgical and nonsurgical components are essential to effective healing of these wound. The therapy should be directed toward the causes including chronic tissue hypoxia, nerve injury and pressure trauma. The majority of ulcers can be healed with proper care and if tissue hypoxia can be controlled then prevention of foot ulcers is possible, with the most cost-effective and desirable means of preventing morbid complication of diabetes.[12] A study of expenses performed in America in 1998 indicated that the cost to treat one simple ulcer was from $5000 to $8000. The cost of treating an infected ulcer upon hospital admission is approximately between $50000 to $150000 in direct expenses.[12] Indirect costs, as those related to family support, disability, and loss of independence, are many times the cost of direct expenses. It is more expensive to treat diabetic complications than to treat a simple diabetes mellitus where in the present study patients admitted to the hospital with diabetic foot syndrome stayed between (3-55) days with a mean stay of 27 days.

CONCLUSION

From this study it can be concluded that diabetic foot syndrome is a major complication of non-controlled diabetes mellitus which can be prevented by education and proper management. Meropenem was found to be more effective than any other antibiotic in treatment of Diabetic Foot Syndrome. Amputation can be minimized and prevented in diabetic patients by controlling blood sugar levels, antibiotic use, and debridement.

REFERENCES

1. Clark CM Lee A (1995) Prevention and treatment of the complication of diabetes millets, *N Eng I J Med*. **332**, 1210-1217.

2. World Health Organization (1985) Diabetes millets: Report of a WHO study group Geneva, World Health Organization 1985.

3. Macro RD, VerlatoG, Locatella F, Bonora E and Muggeo M

(1999) Cause- specific mortality in type II diabetes, *Diabetes Care* **22**, 756-761.

4. PyorK, Pedersen TR, Kjekshus J, Faergeman O, Olsson AG and Thorgeirsson G (1997) The Scandinaviansimvastatin survival study, *Diabetic Care* **20**, 614-620.

5. Chaturvedi N, Stezens L and Fuller J (1997) Which features of smoking determine mortality risk in former cigarette smoker with diabetes ? The World Health Organization study group, *Diabetes Care* **20**, 1266-1272.

6. Courten Hodge AM (1998) Zimmer Epidemiology of diabetes: Lessons for the endocrinologist, *The Endocrinology* **8**, 62-70.

7. Abbas ZG, Gill GV and Archibald LK (2002) The Epidemiology of diabetes Limb sepsis, *An African Perspective Diabetic Med*. **29**, 895-899.

8. Nouedoui C, Teyang A and Djoumessi S (2003) Epidemiology profile and treatment of diabetic foot at the national diabetic center of Yaoundé Cameroon, *Tunis Med*. **81**, 20-25.

9. Todd WF, Armstrong DG and Liswood PJ (1996) Evaluation and treatment of infected foot in a community teaching Hospital, *Journal of American Podiatric Medical Association* **19**, 1275-1260.

10. Reiber GE (2001) Epidemiology of foot ulcer and amputations in diabetic foot In: Bowker JH, Pfeifer MA, (Editor). Leven and O'Neal's. The diabetic foot St. Louis, MO: Mosby 2001, pp.13-32.

11. Grayson ML (1995) Diabetic foot infection: antimicrobial therapy, *Infected Dis Clin North Am*.**9**, 143-161.

12. Jeffery Wieman T (2005) Principal of management: the diabetic foot, *The American Journal of Surgery* **190**, 295-299.

13. Pellizer G, Strazzabosco M, Presi S, Furlan F, Lora l and Benedetti P (2001) Bonatot In the microbiological assessment of limb-threating diabetic foot infections, *Diabetic Medicine* **18**, 822-827.

14. Gonzalez FJ, Alramadan M, Matesanz M, Diaz A, Gianzalez-Rom F and Candel I (2003) Infection in diabetic foot ulcers, *European Journal of Internal Medicine* **14**, 341-343.

15. Edmonds ME and Foster AVM (1999) Managing the diabetic foot. Oxford: Blck well Science 1999.

16. Slater RA, Lazarovitch T, BoldurI and Ramot Y (2004) Buchs accurately identified bacterial pathogens in diabetic foot wound not involving bone, *Diabetic Medicine* **21**, 705-709.

17. Elzouki A and Bubtaina W (2006) Patterns of Hospital admission of diabetic patient to Al-Jamahiriya Teaching Hospital, Benghazi, *JMJ* **6**(1).

18. Erokhsi A, AhmedS, Aribi N and Nagmush S (2009) Diabetic Foot Lesion in the Libyan Population, *JMJ* **9**(4), 18. 19.

19. Oyibo O, Jude EB,Voyatzoglou D and Boulton AJM (2002) Clinical characteristic of patient with diabetes foot problems: changing patterns of foot ulcer presentation, *Pract Diabetes Int* **19**, 10-12.