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Diabetic Foot Management in India- A 3 Year Audit from Tertiary Care Centre

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ABSTRACT: Diabetic foot is now considered a serious problem worldwide. The pattern of occurrence of it differs in different countries. The diabetic foot is often considered multidisciplinary in the west and it involves regular role of different specialist like vascular surgeons, plastic surgeons, orthopedicians, infectious disease specialist, etc. However, this cannot be applied to developing countries where disease occurs in different patterns and cost plays a major role. Further, the specialist managing it also differs. This 3 year audit from tertiary care centre from India shows for the first time that there is minimal role of different specialist in management of diabetic foot on regular basis. Further, the usage of modern wound therapy instrument technologies like hyperbaric oxygen therapy machine may not be required to achieve a good salvage rate. Presence of a qualified Diabetic foot surgeon at a super subspecialty level can diminish the role of different specialist and achieve good salvage rate without adding financial burden on the patients.

KEYWORDS: Diabetic foot, Salvage, India

INTRODUCTION

The number of diabetic patients reached 171 million in 2000 and was predicted to increase to 380 million by year 2025 [1]. Diabetic foot is one of the major complications of diabetes occurring all over the world. Patients with diabetes mellitus are indeed prone to develop foot ulcers and infections, both of which serve as major factors for lower limb amputation [2]. The lifetime risk for foot ulcers in people with diabetes has been estimated to be 15% [3].

It is well known that diabetic foot problems in Asians are quite different from Caucasians [4]. It is also well documented that diabetic foot problems in India are infective and neuropathic in nature compared to western developed countries [5].

The aim of this study was to audit a single surgical unit dealing with diabetic foot problems.

METHODS AND MATERIALS

We conducted a retrospective audit of Surgical Unit '3' in department of surgery of St John's medical college, a tertiary care premiere teaching hospital in Bangalore, India. Our hospital caters to patients from nearby states and from different parts of the country . All the diabetic foot problems in the hospital were first treated by surgical department. In this surgical team, there were on an average four surgical faculties of different grade along with postgraduates and interns. One staff [the first author] was qualified and trained in diabetic foot surgery and focused his work on diabetic foot in this unit apart from

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doing his general surgical work. We did a simple auditing of the diabetic foot cases in this surgical unit from January 2011 to December 2013. All diabetic foot patients operated in this surgical unit were included in this study. We evaluated the number of diabetic foot case operated, the major amputations performed in diabetic foot complication, specific investigations done, the adjunctive therapies used, and the number of specialist involved in diabetic foot / wound management.

RESULTS

There were 143 cases of diabetic foot that were admitted during this 3 year period. The overall limb salvage rate was 87% with 13% of the patients undergoing major amputations for diabetic foot complications [Table 1].

SL NO	CASES/ SALVAGE	NUMBER/ PERCENTAGE
1]	TOTAL CASES	143
2]	LIMB SALVAGE RATE	87%
3]	MAJOR AMPUTATION RATE	13%

TABLE 1 SHOWING THE TOTAL NUMBER OF CASES AND SALVAGE RATE IN OUR SURGICAL UNIT

13 patients [9.09%] had peripheral arterial disease. Out of them, 3 cases [2.097%] underwent peripheral bypass surgery by the vascular surgeons which amounts to 1 case per year and 3 patients [2.097%] underwent peripheral angioplasties done by our interventional cardiologist [Table 2].

SL NO	ROLE OF DIFFERENT SPECIALIST	NUMBER/PERCENTAGE
1]	PLASTIC SURGEON ROLE	3 CASES IN 3 YEARS. NO FREE FLAPS
2]	VASCULAR SURGEON ROLE	ONE CASE/YEAR[2.097%]
3]	ENDOVASCULAR INTERVENTION	ONE CASE/ YEAR [2.097%]
4]	ORTHOPEDICIAN ROLE	0%
5]	NEUROSURGEON ROLE	0%
6]	INFECTIOUS DISEASE SPECIALIST ROLE	0%
7]	PSYCHIATRIST ROLE	0%
8]	COMMUNITY PHARMACIST ROLE	0%
9]	TISSUE VIABILITY NURSE ROLE	0%
10]	NUTRITIONIST ROLE	0%
11]	NURSE EDUCATOR	0%

TABLE 2 SHOWING THE ROLE OF DIFFERENT SPECIALISTS

2 patients [1.39%] were transferred to plastic surgery where they underwent local flap closure. None of them had any free flap reconstruction. There were 7 cases [4.89%] of charcot foot with 3 cases being acute and 4 cases were chronic charcot foot with ulcer. There was no charcot reconstruction during this period. There were no surgeries done by orthopedicians during this period. Our unit/ department have no infectious disease specialist, psychiatrist, tissue viability nurses, neurosurgeon nurse educator or community pharmacist.

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The routine dressings on this diabetic foot wounds were done by either our house surgeons, nurses, postgraduate trainees or the faculties. 35 patients [25.55%] had documented usage of modern dressings like hydrogels/hydrocolloid/alginates, etc. Only 4 patients [2.8%] were subjected to MRI in our unit. 6 patients [4.2%] had negative pressure wound therapy during this period which is 2 patients/ year requires NPWT usage [Table 3].

SL NO	OTHER MODALITIES	NUMBER/ PERCENTAGE
1]	PERIPHERAL ARTERIAL DISEASE	9.09%
2]	MRI	4 CASES IN 3 YEARS
3]	FOOT AND ANKLE RECONSTRUCTION	0%
4]	MODERN DRESSING [INCLUDING GROWTH FACTORS]	25.5%
5]	NEGATIVE PRESSURE WOUND THERAPY	4.2%
6]	HYPERBARIC OXYGEN THERAPY	0%
7]	OZONE THERAPY	0%

TABLE 3 SHOWING OTHER MODALITIES

None of the patients underwent hyperbaric oxygen therapy/ Ozone therapy.

We did not record the role of different physician as they were called up on as and when need basis like in diabetic ketoacidosis, uncontrolled diabetes, in high risk cases like IHD patients or in patients with kidney disease and also many of the patients were referred by them to our surgical OPD. They were involved only when systemic problems were to be addressed.

DISCUSSION

Diabetic foot poses huge cost both to the society and the individuals [7]. Prevention of this complication thus becomes quite essential.

Diabetic foot is often considered multidisciplinary for successful limb salvage by the western counterpart without actually defining the actual role/ frequency of case involvements by the individual specialist [8, 9, 10]. One often sees in various articles written in journal where it's mentioned that diabetic foot is multidisciplinary with important role of vascular surgeons, plastic surgeons, orthopedician, etc without giving any solid evidence of their involvement in the cases. In some centre's, Diabetic foot was under vascular division [10]. Our data clearly shows that only 2.09% of the diabetic foot cases had involvement of vascular surgeons. Even when it came to plastic surgical procedures, there was no free flaps done in our series yet we had a good limb salvage rates. This is because of the salvage attempt by the surgeons from beginning itself with supervision of the specialist podiatric surgeon in difficult cases.

We compared our data with some of the series from the best centers in the India that has a dedicated Podiatry division at super subspecialty level wherein the decision on salvage and major amputation is done by them. In one such series [11], the peripheral bypass procedure rate in diabetic foot was around 3.32% and peripheral angioplasty was around 6.73%. In our series too, the peripheral vascular bypass surgery was required in 2.097% and angioplasty was done in 2.097% of the cases which is one case/year. We had no case where free flap was done and neither did we have any case operated by orthopedic team. The overall salvage rate in our series was 87% which is comparable to the literature [11, 13]. There was no foot and ankle reconstructive surgeries in this series. If one looks even at the best diabetic limb salvage centers in India, the rate of reconstructive surgeries is only 10 cases per year [14], which means less than one case per

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month at tertiary care referral centre with dedicated limb salvage team. This shows that there is decline in charcot foot reconstructive surgeries.

Even when it comes to usage of wound care instrument technologies, our series shows no usage of hyperbaric oxygen therapy or ozone therapy which people keep recommending for good salvage outcomes. We used negative pressure therapy in 4.2% of cases, which is 2 patients per year. Our team uses negative pressure wound therapy device [NPWT] judiously and only in selected cases where we feel NPWT will help in limb salvage without getting influenced by the market driven industry. In one of the series from Limb salvage centre in India, it can be seen that there NPWT usage was only 2.5 cases/ month [15] where the centre have high volume OPD's and admissions of diabetic foot. Even at this Teaching institute of excellence, NPWT was used judiously.

Many series in literature [8, 9, 10] states role of other specialist in achieving successful limb salvage. In our series, there was no role of specialist like neurosurgeon, infectious disease specialist, community pharmacist, nurse educator, nutritionist, psychiatrist, etc [16] yet we had good salvage rate. The authors believe that there is a bit of literature confusion [17], a term coined by the primary author, when it comes to role of different specialist in diabetic foot salvage. Every specialty needs involvement of different specialist in difficult cases, but in diabetic foot specialty it appears to be overemphasized the role of different specialist.

CONCLUSION

Diabetic foot problems undoubtedly differ between Asian and Western population, so also the management. Often considered multidisciplinary in the west, our series for the first time describes the actual role of different specialist involvement with cases. Our Limb salvage rate was 87% with our unit having a dedicated qualified Diabetic foot surgeon. This salvage rate is comparable with the literature. This article shows that the role of other specialist like plastic surgeon, orthopedician, vascular surgeon etc is very minimal in management of diabetic foot. In west, there role may be more as many of these diabetic foot team has podiatrist who often doesn't perform surgeries or major amputations and often depends on other specialist opinion for limb salvage and decision making.

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