Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

Incidence, Etiology and Outcomes of Lower Limb Amputations among Patients of K.R. Hospital, Mysore -A Systemic Review

Dr. Lokesh M.G.[1], Dr. S. Chandrashekar[2], Dr Samarth Jain A.J.[3], Dr. Thriweni M.[4], Dr Arpitha M.R.[5], Dr. Manish Shetty[6], Dr. Dushyanth Shetty[7]

[1]Associate Professor, Department of General Surgery, Mysore Medical College and Research Institute, Mysore, Karnataka, India.
[2]Professor, Department of General Surgery, Mysore Medical College and Research Institute, Mysore, Karnataka, India.
[3]DrNB Fellow, Department of Thoracic Surgery, Institute of Chest Surgery, Chest Onco Surgery and Lung Transplantation, Medanta- the Medicity, Gurugram, Haryana, India.
[4]Postgraduate Resident, Department of General Surgery, Mysore Medical College and Research Institute, Mysore, Karnataka, India.
[5]Assistant Professor, department of Biochemistry, JSS Medical College, Mysuru, Karnatka, India.
[6]Postgraduate Resident, Department of General Surgery, Mysore Medical College and Research Institute, Mysore, Karnataka, India.
[7]Postgraduate Resident, Department of General Surgery, Mysore Medical College and Research Institute, Mysore, Karnataka, India.

Corresponding Author
Dr. Thriweni M., Postgraduate Resident, Department of General Surgery, Mysore Medical College and Research Institute, Mysore, Karnataka, India.

Received: 01-07-2024 / Revised: 11-07-2024 / Accepted: 19-08-2024

ABSTRACT

Background
The aim of the study is to outline the incidence, patterns and causes of lower limb amputations among patients attending KR Hospital in Mysore, India.

Methods
This is a retrospective study which was done at KR Hospital in Mysore, India., from March 2022 to May 2024. Data was collected from the medical records system of the hospital. The following parameters of all the patients who had lower limb amputation (LLA) during this period were recorded: Age, sex, indication for amputation, level of amputation and complications. Incidence rates were calculated using the number of discharges for diabetes and non-diabetes related lower extremity amputations as the numerator and estimates of the resident population with and without diabetes as the denominator.

Results
Over a period of 24 months, 218 LLAs were performed. Age of the patients ranged from 20 to 80 years with an average age of 53.5 years. 85.32% of the amputees were males. Diabetic foot complications and peripheral vascular disease were the most common indication for LLA in our series and followed by few cases of acute limb ischemia, necrotizing fascitis non healing ulcers,

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

trauma and rarely tumors. Infection was the most common complication that involved amputation stumps, followed by wound dehiscence.

Conclusions

Complications of diabetes mellitus and peripheral vascular disease were the most common indications for limb amputations in our region. Patient education regarding lifestyle modification, proper control of diabetes, and foot care will play a pivotal role in prevention of such morbidity in diabetic patients.

No matter how good the prosthesis and replacement services available are, it will never be good enough to replace an anatomically normal and functional limb. So it cannot be stressed enough that prevention is better than cure.

Keywords: Acute limb ischemia, Necrotising fascitis, Non –healing ulcers, PVD.

INTRODUCTION

The term "amputation," which originates from the Latin word "amputare" (meaning "to excise" or "to cut out"), refers to the surgical removal of a body part enclosed by skin.[1]

The reasons for performing an amputation can vary widely across different studies. Among the most frequently cited causes are complications arising from diabetes mellitus and peripheral vascular disease.[2]

Diabetes mellitus is broadly recognized as the leading cause of major limb amputation, with reported rates ranging from 25% to 90% depending on the study[3]. Other common reasons include non-diabetic vascular insufficiency and trauma. [4,5]

When performing a limb amputation, the surgeon's primary focus is on either saving the patient's life or removing a diseased or severely injured limb under challenging conditions. Lower limb amputation (LLA) can be classified as major or minor, with major LLA occurring at or above the ankle level.[6]

The most frequent reasons for LLA vary globally, but trauma and peripheral vascular disease (PVD), including diabetic foot, are significant contributors.[7,8] Ebskov et al. found that the male-to-female ratio for LLA patients in the UK, USA, and Scandinavia is 2:1, a ratio that has remained consistent over the past 20 years.[9]

Masood et al. reported that in developing countries, complications from diabetes mellitus and trauma are the most common causes for LLA[10]. These findings contrast with other studies that have identified trauma as the leading cause of major limb amputation.[11,12]

In developed countries, atherosclerosis is the most common indication for lower limb amputations while in developing countries diabetic foot and trauma are the leading causes.

Dormandy and Thomas in 1988 reported that saving the knee joint increases the amputee's rehabilitation potential.[13]

Although globally there is a fall in the number of AK amputations as there are more and more efforts to save the knee joint.

The usual complication rates range between 20-40% as reported by a study conducted by Chalya et al in Tanzania[8] and by Essoh et al in Nigeria[14]. The most common complication was superficial surgical site infection.

AIMS AND OBJECTIVES

The aim of the study is to outline the incidence, etiology and outcomes of lower limb amputations among patients attending a tertiary care center i.e KR Hospital, Mysore, India.

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

MATERIALS AND METHODS

This is a retrospective study which was done at KR hospital, Mysore, India, from March 2022 to March 2024.

Data was collected from the medical records of the hospital. The following parameters of all the patients who had lower limb amputation (LLA) during this period were recorded: Age, sex, indication for amputation, level of amputation and complications. In case there was a conversion to a higher level, the amputation level was recorded as the new revised level. Other post op complications if present was studied and recorded. Data was collected and analyzed using SP

Inclusion criteria

Inclusion criteria was all patients who underwent lower limb amputation, more than 20 years of age

Exclusion criteria

- Patients those who were less than 20 years of age and those patients who underwent amputation from another centre and came to our hospital for follow up or management of complications.
- As per inclusion and exclusion criteria;study people were selected.Total number of 218 patients were included in the study

RESULTS

Over a period of 24 months, 218 LLAs were performed. Age of the patients ranged from 20 to 80 years with an average age of 53.5 years. 87.15% of the amputees were males. Diabetic foot complications and peripheral vascular disease were the most common indication for LLA in our series.

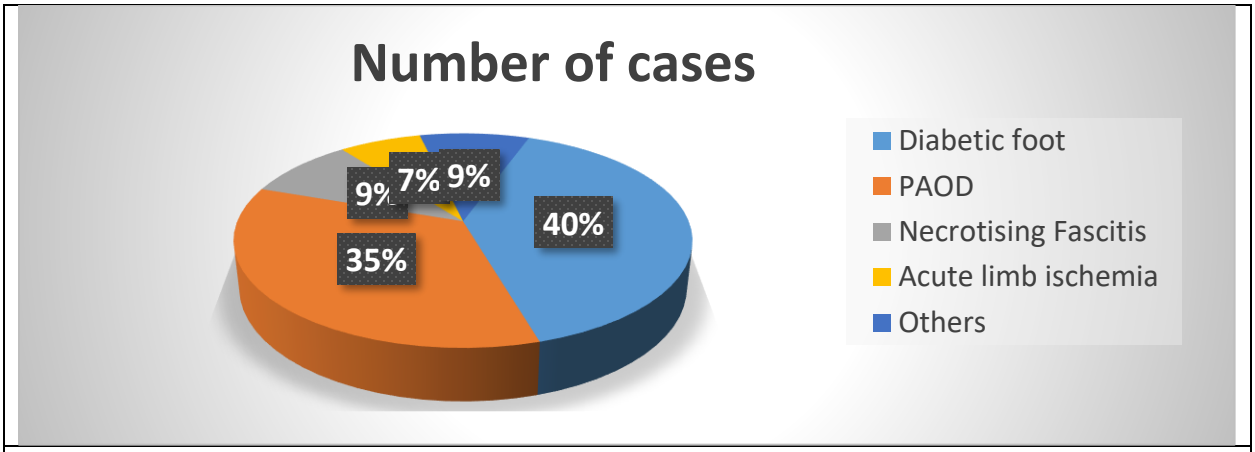
Followed by necrotising fascitis, Acute limb ischemia, non healing ulcers of lower limbs, and also there were a few cases of trauma and rarely tumors. Infection was the most common complication that involved amputation stumps, followed by wound dehiscence. All the infected stumps required debridements with suturing and only 3% required a revision amputation at a more proximal level. There was one mortality noted during the study period.

In our series, 39.90% limbs were amputated for diabetic foot complications and 34.86% limbs peripheral vascular disease, 9.17% due to necrotising fascitis and 6.88% due to acute limb ischemia and 9.17% due to other causes like non healing ulcers of lower limb ,trauma and tumors.

Etiology	Diabetic foot	PAOD	Necrotising Fascitis	Acute limb ischemia	Others
Number of cases	87	76	20	15	20

Table 1: Etiology

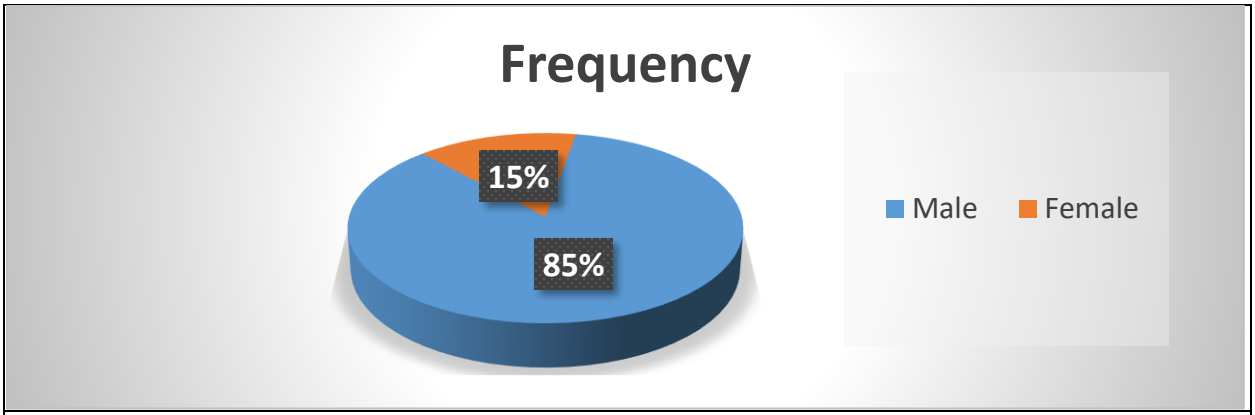
ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024



Graph 1: Etiology

Gender	Frequency	Percentage
Male	186	85.32%
Female	32	14.67%
Total	218	100%

Table 2: Gender Distribution

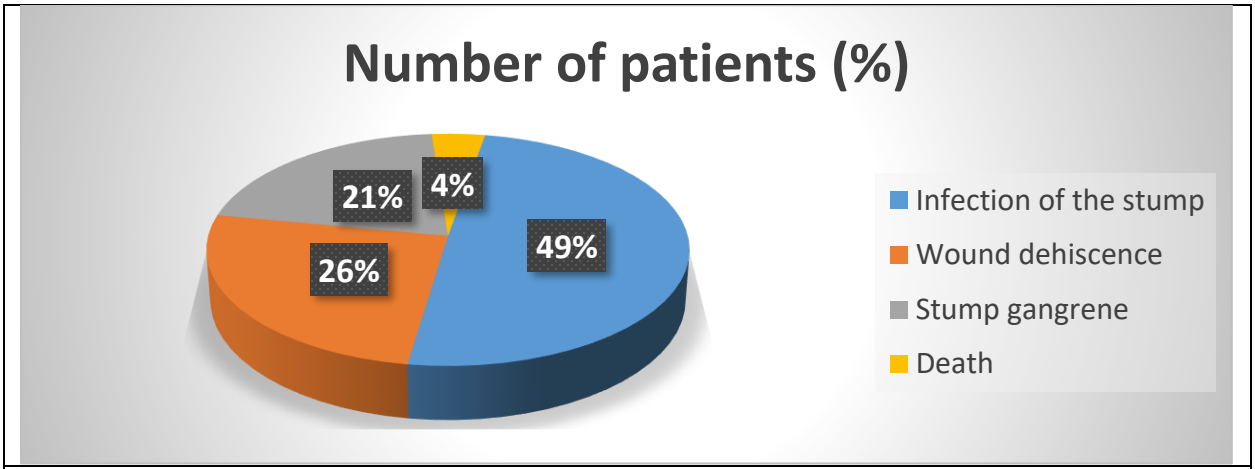


Graph 2: Gender Distribution

Complication	Number of patients (%)
Infection of the stump	62 (49.6%)
Wound dehiscence	32 (25.6)%
Stump gangrene	26 (20.8%)
Death	5 (4%)

Table 3: Rates of Complications

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024



Graph 3: Rates of Complications

DISCUSSION

In limb amputations, the reasons for the procedure are numerous and vary by location. Generally, in developed countries, peripheral vascular disease (PVD) is the leading cause, attributed to increased life expectancy and a sedentary lifestyle.[13]

Pooja and Sangeeta, in their epidemiological study from January 2008 to January 2010 in Kolkata, India, found that 70.3% of amputations were due to trauma[7]. Similarly, Paudel et al., in a retrospective review from 1997 to 2004, identified road traffic accidents (RTA) as the primary cause, accounting for 74.29% of lower limb amputations in adults at a tertiary care hospital in Nepal.[10]

Early minor amputations can help prevent the need for later major amputations.[15] This approach often indicates a higher quality of care with timely interventions, thus averting the progression from minor to major amputation.

Dormandy and Thomas reported in 1988 that preserving the knee joint enhances the rehabilitation potential[13] for amputees. Despite a global trend towards reducing above-knee (AK) amputations due to efforts to save the knee joint, our study found that the most common level of amputation was toe disarticulation (63%). According to Nwadiaro et al., this may be because patients often present late with advanced gangrene or sepsis, leading surgeons to opt for a higher-level amputation.[16]

In our series, 39.90% limbs were amputated for diabetic foot complications and 34.86% limbs peripheral vascular disease, 9.17% due to necrotising fascitis and 6.88% due to acute limb ischemia and 9.17% due to other causes like non healing ulcers of lower limb, trauma and tumors. Mean age of the population is 53.5 years which was not similar to the findings in other studies, which showed the mean age to be around 30 to 50 years of age.[17] This difference is probably because in those studies, trauma was the second most common indication for amputation and the younger age group was affected more.

This difference is probably because in those studies, trauma was the second most common indication for amputation and the younger age group was affected more. As the age of onset of diabetes reduces and the age of survival increases, more time exists for complications of diabetes including LLA to develop.[18,19]

Removing a non-functional, dying, or infected limb can enhance the patient's quality of life and facilitate early ambulation.[20]

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

However, the presence of co-morbidities, particularly diabetes, increases the risk of mortality during the peri-operative period.[8,9] In our series, the postoperative mortality rate was 0.4%. One patient with peripheral vascular disease and a history of cerebrovascular accident died of cardiac arrest during the postoperative period.

Males are particularly at risk of trauma, especially in developing countries where they often work outdoors and are exposed to accidental hazards. Additionally, males in South East Asia are more likely to engage in risk factors for peripheral vascular disease (PVD), such as cigarette smoking and tobacco chewing, compared to females who typically stay indoors and manage household responsibilities.

A study from Karachi, Pakistan reported that 86.6% of patients were male, while a study from Kolkata[7,21], India found 86% male patients. In contrast, a study from northern Netherlands reported that only 61% of patients were male.[21]

Wound infection is the most frequent complication in the postoperative period.[8] In our study, the complication rate was 48.62%, which is higher than the rates reported by Chalya et al. in Tanzania and Essoh et al. in Nigeria.[8,15]

The most common complication was superficial surgical site infection. This elevated rate of postoperative complications is likely due to the severity of sepsis present in patients before the amputation.

CONCLUSION

Complications of diabetes mellitus and peripheral vascular disease were the most common indications for limb amputations in our region. Patient education regarding lifestyle modification, proper control of diabetes, and foot care will play a pivotal role in prevention of such morbidity in diabetic patients and smoking sessation in PVD.

No matter how good the prosthesis and replacement services available are, it will never be good enough to replace an anatomically normal and functional limb. So it cannot be stressed enough that prevention is better than cure.

REFERENCE

1. Banerjee SN. Editor. Rehabilitation management of amputees. Williams & Wilkins; 1982.
2. Akiode O, Shonubi AO, Musa A, Sule G. Major limb amputations: an audit of indications in a suburban surgical practice. Journal of the National Medical Association. 2005; 97(1):74.
3. Unwin N. Epidemiology of lower extremity amputation in centres in Europe, North America and East Asia. British Journal of Surgery. 2000; 87(3):328-37.
4. Heikkinen M, Saarinen J, Suominen VP, Virkkunen J, Salenius J. Lower limb amputations: differences between the genders and long-term survival. Prosthetics and orthotics international. 2007; 31(3):277-86.
5. Moxey PW, Hofman D, Hinchliffe RJ, Jones K, Thompson MM, Holt PJ. Epidemiological study of lower limb amputation in England between 2003 and 2008.British journal of surgery. 2010; 97(9):1348-53
6. Farsi Z, Azarmi S. Effect of roy's adaptation model-guided education on coping strategies of the veterans with lower extremities amputation: a double-blind randomized controlled

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 08, 2024

clinical trial. International journal of community based nursing and midwifery. 2016; 4(2):127.
7. Pooja GD, Sangeeta L. Prevalence and aetiology of amputation in Kolkata, India: A retrospective analysis. Hong Kong Physiotherapy Journal. 2013; 31(1):36-40.
8. Chalya PL, Mabula JB, Dass RM, Ngayomela IH, Chandika AB, Mbelenge N *et al*. Major limb amputations: A tertiary hospital experience in northwestern Tanzania. Journal of orthopaedic surgery and research. 2012; 7(1):18.
9. Ebskov B. Choice of level in lower extremity amputation - nationwide survey. Prosthetics and orthotics international. 1983; 7(2):58-60
10. Paudel B, Shrestha BK, Banskota AK. Two faces of major lower limb amputations. Kathmandu University medical journal (KUMJ). 2005; 3(3):212-6.
11. Kidmas AT, Nwadiaro CH, Igun GO. Lower limb amputation in Jos, Nigeria. East African medical journal. 2004; 81(8):427-9.
12. Yusof MI, Sulaiman AR, Muslim DA. Diabetic foot complications: a two-year review of limb amputation in a Kelantanese population. Singapore medical journal. 2007; 48(8):729-32.
13. Sabzi Sarvestani A, Taheri Azam A. Amputation: A tenyear survey. Trauma Mon. 2013; 18:126-9.
14. Thanni LO, Tade AO. Extremity amputation in Nigeria - a review of indications and mortality. The Surgeon. 2007; 1;5(4):213-7.
15. Nwankwo OE, Katchy AU. Surgical limb amputation: a fiveyear experience at Hilltop orthopaedic hospital Enugu, Nigeria. Nig J Orthop Trauma. 2004; 3:139-49.
16. Nwadiaro HC, Obekpa PO, Kidmas AT, Deshi PJ. Amplitudes of amputation. Nig J Surg Sci. 2000; 10: 44-8.
17. Essoh JB, Bamba I, Dje Bi Dje V, Traore A, Lambin Y. Limb amputations in adults in an Ivorian Teaching Hospital. Niger J Ortho & Trauma. 2007; 6(2):61-3.
18. Lee JM, Pilli S, Gebremariam A, Keirns CC, Davis MM et al. Getting heavier, younger: trajectories of obesity over the life course. Int J Obes. 2010; 34:614-623.
19. Lipscombe LL, Hux JE. Trends in diabetes prevalence, incidence, and mortality in Ontario, Canada: a populationbased study. The Lancet. 1995-2005; 369:750-756.
20. Salman KF, Laporte R. The incidence rate of lower extremity amputation in Amman, Jordan. J Med. 2010; 44:72-87.
21. Jawaid M, Ali I, Kaimkhani GM. Current indications for major lower limb amputations at Civil Hospital, Karachi. Pak J Surg. 2008; 24:228-31.