



RISK FACTORS IN PATIENTS UNDERGOING LOWER LIMB AMPUTATIONS.

Dr Ananthu N

Junior Resident, Department Of General Surgery, Government Medical College, Kozhikode, Kerala.

ABSTRACT

Introduction: Although lower limb amputation is a common procedure the exact number of people who undergo amputations worldwide is difficult to find. Amputations are done on emergency and elective basis in worldwide. Each year more than 1,50,000 individuals are admitted to hospitals to undergo amputations secondary to peripheral vascular disease, Diabetes, or other causes. This study aims to understand the co morbidities in patients undergoing lower limb amputations. **Objectives:** 1.To study about the risk factors patients undergoing lower limb amputations. **Methodology:** A proforma was prepared for collecting history and physical examination findings of patients undergoing lower limb amputations. The data collected will be used to identify the co-morbidities and duration of those co-morbidities and to compare the duration of different co-morbidities leading to amputation **Results:** Of the 54 patients who underwent lower limb amputation 64.8% were males. Diabetes was present in 68.5% of the study population followed by POVD which was seen in 51.8%. Smoking was seen to be associated with 31.5% of the population. **Conclusion:** Major lower limb amputations are a common procedure done worldwide. There are many contributing factors which leads a patient to lower limb amputation. The most common risk factor associated as smoking and a low socio-economic status.

KEYWORDS : Above Knee Amputation; Below Knee Amputation.

INTRODUCTION

Amputations are done on emergency and elective basis in worldwide. The goals of amputation are:

- To remove the septic foci
- To prevent the spread of infection
- In traumas when the limb is not salvageable
- Prevention of adjacent joint contractures
- Early prosthetic fitting

Amputations can be divided into two broad categories- Minor amputation and major amputations.

Minor amputations generally refer to the disarticulation of digits.

Major amputations include

- Partial foot amputation-Amputation of the lower limb distal to the ankle joint

Eg-Chopart / Lisfranc, Ray

- Ankle disarticulation - amputation of the lower limb at the ankle joint

Eg-Syme, Pyrogoff, Boyd

- Trans tibial amputation- amputation of the lower limb between the knee joint and ankle joint, commonly referred to as below knee amputation
- Knee disarticulation- amputation of the lower limb at the knee joint
- Trans-femoral amputation- amputation of the lower limb between the hip joint and the knee joint commonly referred to as above knee amputation
- Hip disarticulation- amputation of the lower limb at the hip joint
- Trans-pelvic disarticulation- amputation of the whole lower limb together with all or part of the pelvis. This is also known as a hemipelvectomy or hindquarter amputation

Although lower limb amputation is a common procedure the exact number of people who undergo amputations worldwide is difficult to find. Each year more than 1,50,000 individuals are admitted to hospitals to undergo amputations secondary to peripheral vascular disease or diabetes [1]. As of 2005 an estimated 1.6 million people with amputation live in the United States of home approximately 65% underwent lower limb amputation [2]. Of the approximately 1 million unilateral lower extremity amputations due to dysvascular conditions the most common were toe (33.2%), transtibial (28.2%), transfemoral (26.1%) and foot amputations (10.6%).

The major risk factors for lower limb disarticulation include diabetes and peripheral vascular disease. Persons with diabetes are twenty times more likely to undergo a lower limb amputation than nondiabetics [3]. Patients who have diabetes tends to have more minor amputations than individuals who have peripheral vascular disease who have more major amputations. But the frequency of subsequent amputation is also higher in diabetics. Men more frequently require amputation than women especially for vascular disease.

Peripheral vascular disease is the most common cause of limb loss overall at the rate of dysvascular amputation being nearly 8 times greater than the rate of trauma related amputation the second leading cause of limb loss.

Through this study we can hope to throw some light into the risk factors in patients undergoing lower limb amputations.

MATERIALS AND METHODOLOGY

Study Design

Cross sectional study

Study Setting

This study will be conducted in the Department of General Surgery, Government Medical College Kozhikode, after getting approval from the hospital ethics committee.

Study Duration

1 and half year (January 2021-June 2022)

Sample Size

54

Inclusion Criteria

- Patients who underwent lower limb amputation in the Department of General Surgery, Govt Medical College Calicut in a period of one and half year (2020)

Exclusion Criteria

- Patients who had undergone AK/BK amputation following trauma/malignancy.

Method of Study

After obtaining a written consent the patients undergoing lower limb amputations in Department of General surgery at Govt Medical college Kozhikode were studied using clinical and radiological evidence. Data was collected with the help of proforma, history taking and by verifying case sheets.

Study Tools

- Clinical examination
- Proforma
- Imaging studies

Variables under study

- Age
- Sex
- Diagnosis
- Duration of the disease
- Level of amputation

Data Analysis

Data was entered in Microsoft Excel and was analysed using SPSS software version 18

RESULTS

We could reach around 54 participants who fitted the inclusion criteria. Everyone agreed to participate in the study thus accounting for a response rate of 100%. We could see that around (54%) of the study participants were belonging to the age group of 61-80 years, with a mean age of 66.5 (12.8) years. Around 65% of the study participants were males. 68.5% had DM, and while the second commonest risk factor was Peripheral occlusive vascular disease (52%). Smoking (32%) was found as a separate risk factor. Around 2/3rd belonged to rural residence, and 63% were educated only up to primary level, and around 3/4th of the participants was belonging to lower socioeconomic status. With respect to the level of amputation, we observed that the commonest surgery performed was above knee amputation seen among 47% followed by below knee seen among 43%.

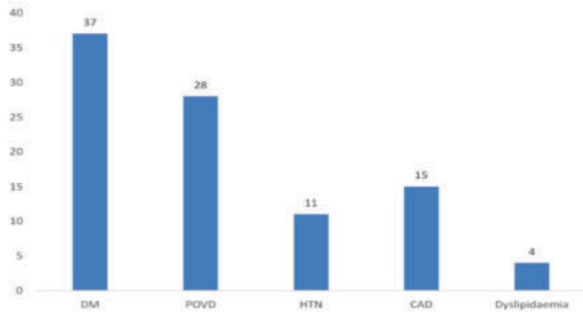


Fig 1: Comorbid risk factors in the study population

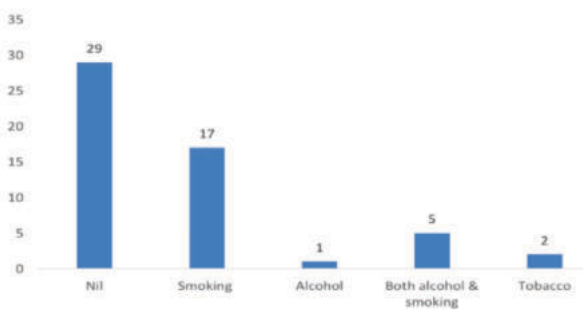


Fig 2: Risk factors in patients in the study population

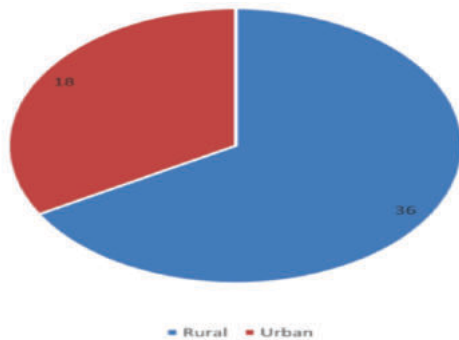


Fig 3: types of residence among patients

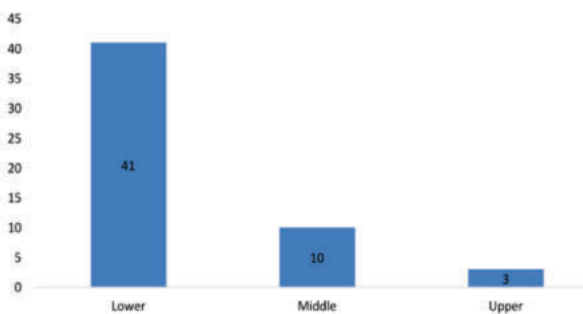


Fig 4: socioeconomic status among patients

DISCUSSION

In our study, mean age of study population is 66.5 years with 64.8% of the study population being males and 35.2% females.

Comparing with other studies undertaken, the reference study of this thesis was done in Germany in 1991 about the incidence of non traumatic amputations it was found that of the 106 residents underwent amputation 77.4% had diabetes.

The result of this study is similar to the parent study conducted by Christoph Trautner et al in Germany showing diabetes (77.4%) as the most common risk factor in patients undergoing lower limb amputations. This study showed that of the 54 patients who underwent lower limb amputation 68.6 % had diabetes followed by POVD (51.8%).

In a study conducted by Kaneko et al[4] about the rates and risk factors for amputation of patients with diabetes in Japan the mean duration of disease was found to be 5.3 years and the most common risk factor identified was smoking which is similar to the findings of this thesis. In this study smoking was found to be a risk factor 31.5% of patients.

In a study conducted by Nulukurthi et al[5] about risk factors associated with amputation in diabetic foot disease patients attending a tertiary care hospital in a rural setting in Department of General Surgery, Konaseema Institute of Medical Sciences and Research Foundation, Andhra Pradesh showed that that rural origin of the patients was found to be a predisposing factor for the development of diabetic foot. This is due to the illiteracy of the patients regarding diabetes and its complications, unavailability of proper health-care facilities, and late presentation to the hospital. Most of the patients who underwent lower limb amputations in this study were found to be from low socioeconomic status (75.9%) follower by middle (18.5%) and upper (5.1%). Furthermore 66.7% of patients who underwent lower limb amputation in this study were from rural areas.

CONCLUSION

Lower-extremity amputation is one of the oldest known surgically performed procedures, dating back to prehistoric times. The most common causes leading to amputation are diabetes mellitus, peripheral vascular disease, neuropathy, and trauma. This study has shown diabetes as the most common risk factor in patients undergoing lower limb amputations with PVD as the second most common cause. Study also showed that smoking is also a common risk factor associated with these patients and identified patients from low socio-economic status and hailing from rural areas are at a higher risk to end up in lower limb amputations.

REFERENCES

- [1] Diabetes, U. K. (2018, December 17). 26,378 diabetes-related lower limb amputations in the last three years. Diabetes UK. https://www.diabetes.org.uk/about_us/news/lower-limb-amputations
- [2] Goldberg, J. B., Goodney, P. P., Cronenwett, J. L., & Baker, F. (2012). The effect of risk and race on lower extremity amputations among Medicare diabetic patients. *Journal of Vascular Surgery*, 56(6), 1663–1668. <https://doi.org/10.1016/j.jvs.2012.05.100>
- [3] Kaneko, M., Fujihara, K., Harada, M. Y., Osawa, T., Yamamoto, M., Kitazawa, M., Matsubayashi, Y., Yamada, T., Seida, H., Kodama, S., & Sone, H. (2021). Rates and risk factors for amputation in people with diabetes in Japan: a historical cohort study using a nationwide claims database. *Journal of Foot and Ankle Research*, 14(1), 29. <https://doi.org/10.1186/s13047-021-00474-8>
- [4] Simhachalam Kutikuppala, L., Nulukurthi, T., & Kumar, S. (2020). A clinical study of risk factors associated with amputation in diabetic foot disease patients attending a tertiary care hospital in a rural setting. *Journal of Current Research in Scientific Medicine*, 6(1), 34. https://doi.org/10.4103/jcrsm.jcrsm_13_20
- [5] Ziegler-Graham, K., MacKenzie, E. J., Ephraim, P. L., Travison, T. G., & Brookmeyer, R. (2008). Estimating the prevalence of limb loss in the United States: 2005 to 2050. *Archives of Physical Medicine and Rehabilitation*, 89(3), 422–429. <https://doi.org/10.1016/j.apmr.2007.11.005>