

# Epidemiology and clinical profile of lower extremity amputations at tertiary care hospital in Aurangabad district of Maharashtra: An observational study

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## Abstract

**Introduction:** Knowledge of indications and associated details of amputation may prove helpful in instituting preventive strategies. Present study describes the epidemiology and clinical profile of Lower Extremity Amputations in surgical cases at Government Medical College & Hospital (GMCH), Aurangabad which is a well known tertiary referral centre in Marathwada region of Maharashtra. **Methods:** This is a study of 174 patients who had visited GMCH, Aurangabad for treatment during the period of February 2004 to October 2006. The lower extremity amputation done in the patients was either elective or an emergency procedure. Age and sex distribution of the cases was described. Etiology was described in males and females. Elective or emergency amputation in relation to the causative pathology was described. Special investigations done, supportive medical treatment, limb conservation procedures adopted and types of amputation done were described. **Results & Conclusions:** Observations show that in our study maximum numbers of cases have occurred in 4<sup>th</sup> to 7<sup>th</sup> decades of life. The study comprised of 150 males and 24 females. Male to female ratio is 6.25:1. Vascular disease was the most common etiology followed by Diabetes. Emergency amputations were more common comprising 78.7% cases. Above knee amputation was the most common type of amputation done in the subjects. Present study gives valuable information regarding the epidemiology and clinical profile of patients undergoing lower limb amputations from the Marathwada region of Maharashtra.


**Keywords:** Lower limb amputation, Vascular Disease, Diabetes.

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first as cause for amputation whereas trauma, infections, uncontrolled diabetes mellitus and malignancies are the leading cause for amputation in developing countries<sup>2, 3</sup>. However in the developing world, the majority of amputees are young and the major cause of limb amputation varies from one region to another. Present study describes the epidemiology and clinical profile of Lower Extremity Amputations in surgical cases at Government Medical College & Hospital (GMCH), Aurangabad which is a well known tertiary referral centre in Marathwada region of Maharashtra.

## INTRODUCTION

Major limb amputation is reported to be a preventable public health problem associated with profound economic, social and psychological effects on the patient and family especially in the developing countries where the prosthetic services are very poor<sup>1</sup>. The incidences of different pathologies leading to limb amputation have been reported to vary from one place to the other. In developed countries peripheral vascular disease ranks

## METHODS

This was a cross-sectional descriptive study involving all patients who underwent major limb amputations at Government Medical College and Hospital, Aurangabad. The study was done in the surgical wards of the Government Medical College and Hospital which is a tertiary care centre as well as a teaching medical institution catering to Marathwada region of Maharashtra as well as adjoining areas. A total of 174 patients who

had visited GMCH, Aurangabad for treatment and undergone lower limb amputation at the hospital during the period of February 2004 to October 2006 were included in the study. In the present study total 174 patients underwent 201 amputations of lower extremity at various levels. The lower extremity amputation done in the patients was either elective or an emergency procedure. Age and sex distribution of the cases was described. Etiology was described in males and females. Elective or emergency amputation in relation to the causative pathology was described. Special investigations done in patients, supportive medical treatment given to the subjects, limb conservation procedures adopted like Thrombolysis, Endarterectomy, Lumbar sympathectomy, Popliteal artery repair and the various types of amputation done along with the etiology for the various types of amputations done were described.

**OBSERVATIONS**

Table 1 shows age distribution of patients who underwent major limb amputations

**Table 1: Age Distribution of Patients**

Age in Years	No. of Cases	Percentage
10 years & below	03	01.72
11-20	07	04.04
21-30	10	05.74
31-40	34	19.54
41-50	33	18.96
51-60	37	21.26
61-70	34	19.54
70 & above	16	09.19
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 2: Sex Distribution of the Patients**

Sex	No. of Cases	Percentage
Male	150	86.2
Female	24	13.8
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 3: Etiology**

Etiology	No. of Cases	Percentage
Vascular	90	51.72
Diabetes	45	25.86
Trauma	16	09.19
Infection	14	08.04
Malignancy	07	04.02
Others	02	01.14
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 4: Etiology in Males (n = 150)**

Etiology	No. of Cases	Percentage
Vascular	84	56
Diabetes	34	22.67
Trauma	13	08.67
Infection	13	08.67
Malignancy	06	04
<b>Total</b>	<b>150</b>	<b>100</b>

**Table 5: Etiology in Females (n = 24)**

Etiology	No. of Cases	Percentage
Vascular	06	25
Diabetes	11	46
Trauma	03	13
Infection	01	4
Malignancy	01	4
Others	02	8
<b>Total</b>	<b>24</b>	<b>100</b>

**Table 6: Emergency or Elective Amputation Surgery in relation to Etiology**

Etiology	Emergency	Elective
Vascular	67	23
Diabetes	41	04
Trauma	16	Nil
Infection	13	01
Malignancy	Nil	07
Others	Nil	02
<b>Total</b>	<b>137 (78.7%)</b>	<b>37 (21.3%)</b>

**Table 7: Special Investigations Done**

Investigations	No. of Cases
Doppler	16
Angiography	Nil
Digital Subtraction Angiography	Nil
Plethysmography	Nil

**Table 8: Supportive Medical Treatment**

Investigations	No. of Cases
Trental	102
Complamina	102
Aspirin	20

**Table 9: Limb Conservation Procedure**

Procedure	No. of Cases
Thrombolysis	01
Endarterectomy	02
Lumbar sympathectomy	07
Popliteal artery repair	02

**Table 10: Types of Amputation in Males**

Types of Amputation	No. of Cases	Percentage
Toe	23	16
Ray	18	10.29
Transmetatarsal	09	05.14
Symes	02	01.14
Below knee	57	32.57
Above knee	60	34.29
Hip disarticulation	01	0.57
<b>Total</b>	<b>175</b>	<b>100</b>

**Table 11:** Types of Amputation in Females

Types of Amputation	No. of Cases	Percentage
Toe	05	19.23
Ray	05	19.23
Transmetatarsal	--	--
Symes	01	03.85
Below knee	07	26.92
Above knee	08	30.77
Hip disarticulation	--	--
<b>Total</b>	<b>26</b>	<b>100</b>

**Table 12:** Etiology for Various Types of Amputations

Amputation	Vascular Cases (%)	Diabetes Cases (%)	Trauma Cases (%)	Infection Cases (%)	Malignancy Cases (%)	Others Cases (%)
Toe	22 (20.75)	1 (1.92%)	5 (26.5)	3 (20)	--	2 (100)
Ray	--	23 (44.23)	--	--	--	--
Transmetatarsal	4 (3.77)	2 (3.84)	1 (5.26)	1 (6.66)	1 (14.28)	--
Symes	1 (0.94)	--	--	1 (6.66)	1 (14.28)	--
Below knee	34 (32.08)	19 (36.53)	5 (26.3)	2 (13.33)	4 (57.14)	--
Above knee	45 (42.45)	7 (13.46)	8 (42.1)	8 (53.33)	--	--
Hip disarticulation	--	--	--	--	1 (14.28)	--
<b>Total</b>	<b>106</b>	<b>52</b>	<b>19</b>	<b>15</b>	<b>07</b>	<b>02</b>

## DISCUSSION

In the present study total 174 patients underwent 201 amputations of lower extremity at various levels. Age distribution analysis showed that age group of 51-60 years was the most common with 21.26% cases belonging to this group. Next common age groups were 31 to 40 years & 61 to 70 years each of which comprised 19.54% cases. About two thirds cases were above 40 years of age. Unwin N *et al*<sup>4</sup> have also reported similar results. They reported that amputations were more common above 40 years of age and two thirds of patients were above 60 years of age. Gregory Dean<sup>5</sup> stated that three quarters of all amputees in England were over the age of 60 years. It was found that in our study around 86% cases were males whereas around 14% were females. Dean AG<sup>5</sup> and Unwin N<sup>4</sup> have reported that men have an amputation rate two to three times higher than that of females. A study that was carried out in Seremban Hospital in Malaysia reported that 34.3% of patients who had amputation were female and 65.7% were male. The average age of the patients was 39.7 years<sup>6</sup>. In our study, vascular pathology was the most common cause of amputation. Similar results are reported by Dean AG<sup>5</sup> and Unwin N *et al*<sup>4</sup> with peripheral vascular disease mentioned as the most common factor associated with lower limb amputation. In our study, 78% cases were emergency amputations. 90% of diabetes cases and 100% trauma and infection cases were amputated on emergency basis. All the malignancy patients underwent elective amputation. Specific investigations were usually done for deciding the level of amputation so as to achieve the maximum healing rate whilst reducing postoperative

morbidity and facilitating early mobilization and rehabilitation. The common modalities of special investigations were Doppler Ultrasound and Angiography in peripheral vascular diseases. The value of duplex scanning for ultrasonic Angiography is widely recognised but its main value is in the identification of stenosis which may be amenable to angioplasty, to document occluded arteries and grafts, to confirm calf vessel patency, to identify and evaluate aneurysms or pseudo aneurysms. Angiography helps to define characteristic pattern and extent of disease but visualization of distal arteries is often inadequate (Baptiste *et al*, 1983<sup>7</sup>). Importance of medical treatment with Aspirin has been well documented and proved in patients with peripheral vascular disease. Aspirin is also known to reduce risk of stroke and myocardial infarction in patients with peripheral vascular disease<sup>8</sup>. Pentoxifyllin (Trental) which improves microcirculation is also known to be helpful in patients with peripheral vascular disease<sup>9</sup>. Medical management also included risk factor modification like cessation of smoking. A Population study has indicated a correlation between smoking and amputation for ischemia<sup>10</sup>. In our study, above knee and below knee were the most common sites of amputation in both males and females. Some other studies have also reported above knee amputation as the most common procedure performed<sup>11, 12</sup>. The study has its limitations which include an observational and descriptive study design. Also, the sample size is relatively small. However it gives valuable information regarding the clinical profile of lower limb amputation patients from the Marathwada region of Maharashtra. Further research needs to be done

to better understand the epidemiology of lower limb amputations which may help in designing better prevention and management strategies towards the problem.

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