



## THE INSTITUTIONAL DEMOGRAPHIC PROFILE OF AMPUTATION IN MUMBAI.

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**ABSTRACT** Amputation is a locomotor disability and final outcome of various co morbidities of traumatic and non traumatic causes. The aim is to conduct a retrospective observational study using records of patients attending disability clinic from 1st January 2016 to 31st December 2016 to study the common types, causes, extremity affection, gender and age group in amputation. In the study we evaluated records of 994 patients of which 171(17.2%) were amputations, with a male to female ratio of 5.6:1, with 15.2% of double limb amputation. Our study showed maximum number of amputations were below knee (39%) followed by partial hand (18%). The study also showed maximum number of amputations occurred in age group of 51 to 60 years. The study concluded that prevalence of amputations is high in urban population. The knowledge about rehabilitation in amputees was less, warranting attention to create rehabilitation infrastructure for improvement in their lifestyle.

**KEYWORDS :** Demographic distribution, Congenital amputations, Traumatic amputation, Locomotor disability.

### Introduction

Amputations are common outcome of various health conditions like birth defects, trauma, diabetes, peripheral vascular disease etc. Amputations form a major bulk of locomotor disabilities. [1] Baseline prevalence and demographic data is required if efforts are to be made for isolations of cause of amputations for their prevention. On the other hand post amputation, the outcome can be very good if the residual disability is adequately addressed with rehabilitation interventions and good prosthetic management. So understanding the overall affected population and demographic distributions of amputations is essential as guidance for overall rehabilitation efforts and investment to manage the problem. Currently studies available focus on causes related lower limb amputations [2,3,4,5] but data related upper limb amputation or congenital amputations is lacking making the overall picture incomplete.

### Methods

#### Aims

- To evaluate the overall prevalence of amputation with its demographic and topographic distribution.
- To delineate the causes of amputation

#### Assessors

- Dr. Amit Mhambre** : outcome assessor, performed statistical analysis of data
- Dr. Vivek Chawathe** : outcome assessor, performed statistical analysis of data

#### Study population

We conducted a retrograde observational study at All India Institute of Physical Medicine and Rehabilitation, Mumbai a tertiary care unit for treatment of person with disability and a center for locomotor disability assessment and certification. Records of all the patients attending the disability certification board from 1st January 2016 to 31st December 2016 were analyzed for study.

The evaluation forms of patient attending the disability certification clinic were screened for data regarding amputation. Data of all the

patients with amputation were included in the study. Data of patients with locomotor disability but without amputation was excluded from the study. Data in form of age, sex, religion, side of amputation, duration of amputation, level of amputation was collected and was submitted for analysis. Data analysis was done using Microsoft office excel 2007 version on windows 8 OS.

#### Ethics

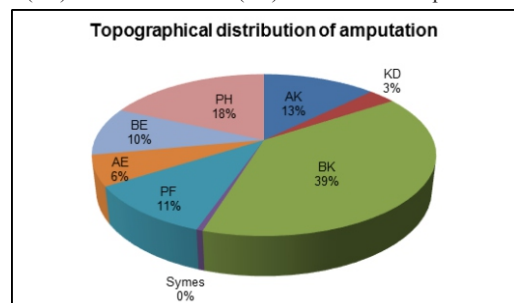
The Ethics approval was taken from the necessary ethics committee.

#### • Results

In our study 994 patients attended the disability clinic from 1st January 2016 to 31st December 2016 out of which 171 had amputations. Thus the prevalence of amputation as cause of locomotor disability was 17.2%. Out of the 171 patients 145 were male and 26 were female. Thus the male: female ratio is 5.6:1. Our study had 26 (15.2%) patients with amputation of two limbs, so total of 197 amputations were considered in the study. The side of amputation involved was right sided 94 and left sided 103 and over all right: left ratio was 1:1.09.

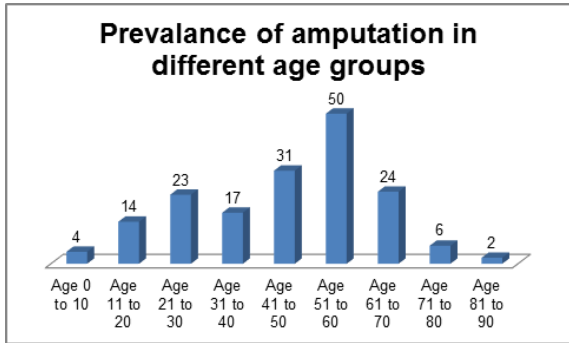
#### Topographical distribution of amputation

In our study in lower extremity, we had 25 Above Knee (AK), 6 Knee Disarticulation (KD), 77 Below Knee (BK), 1 Syme's, 21 Partial Foot (PF). In upper extremity we had 12 Above Elbow (AE), 19 Below Elbow (BE) and 36 Partial Hand (PH) and wrist level amputations.



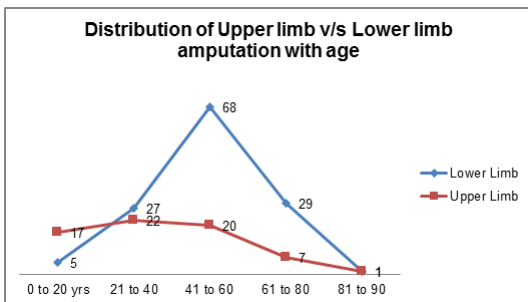
**Prevalence of amputation according to age**

In our study population maximum number of amputations occurred in age group of 51 to 60 (29%), followed by age group of 41 to 50 (18%), followed by 61 to 70 (14%), followed by a younger age group of 21 to 30.



**Upper limb v/s Lower limb distribution**

In the age group of 0 to 20 only 5 lower limb amputations were present whereas 17 upper limb amputations were present; the presentation reverses in the age group of 41 to 60 where 68 lower limb amputations were present as compared to only 20 upper limb amputations.



**Causes of amputation**

In our study 100(58.4%) individuals had amputations due to systemic illness as diabetes 52 (30%), peripheral vascular disease 14(8%), infection 10(5.8%), malignancy 5(2.9%), congenital 16 (9.4%), 3 individuals with miscellaneous cause as lymphotoedema, osteomyelitis and snake bite. In our study we found that 71(41.5%) were traumatic amputations out of which 28(16.3%) were due to road traffic accidents, 23 (13.4%) due to railway accidents, 20 (11.6%) due to other types of traumas like industrial accidents, burns, crush injuries etc.

**Discussion**

In our study we included patients attending the disability clinic which receives applications from throughout the city of Mumbai. Thus the data retrieved represents the urban population with locomotor disorders. The 2011 census suggests that locomotor disability is 20.3% which is the highest of all other types of disabilities. In our study we found that amputations contributed to 17.1% of total locomotor disability population screened which translates to a significant number of amputee population in India. The 2011 census also suggested that locomotor disability peaks in the population in age group of 80-89 years [6]. In our study we found that the individual with amputations peaks at the age of 51-60 years which suggest that amputation is a factor which adds locomotor disability to the aging population.

In our study we found male: female ratio of amputation to be 5.6:1 whereas ratio of locomotor disability according to 2011 census is 1.6: 1, thus suggesting the involvement of male population in amputation is far more than female as compared to overall locomotor disability [6].

In our study we could observe a distinct pattern of amputation in different age groups for upper limb and lower limbs. Upper limb amputation were on the higher side in first 4 decades of life followed by gradual reduction in number by the age above 60 years, whereas lower limb amputation peaked in the age group of 41-60 years. Higher prevalence rate of upper limb amputations could be correlated to involvement of upper limb in industrial trauma. Also higher rates of amputations in upper limb were seen in age group of 0-20 which

correlates with higher rates of congenital amputations involving upper limbs. Similar study done in children at Jordan suggested that upper limb consisted of 52.17% were as lower limb congenital amputation consisted of 47.83% [7]. In our study 94.73% were upper limb and only 5.26% were lower limb with maximum number of wrist and hand level limb loss. This difference may be due to geographical difference which needs further study.

In one study done in Germany from 2006 to 2012 suggest that diabetes mellitus and arterial occlusive disease were the major cause of lower limb amputation [8]. Our study shows similar results with diabetes mellitus and peripheral vascular disease as the leading cause of amputations followed by trauma. On the contrary a similar study done in West Bengal stated of 70% of amputations was due to trauma which is significantly high as compared to our study [3]. This difference may be due to involvement of more rural population than urban where the prevalence of DM is on lower side [9].

**Conclusion**

Amputations followed a peculiar pattern in relation to age which peaks in geriatric age group. There was a high prevalence of amputations associated with diabetes mellitus and peripheral vascular diseases. The study concluded that the prevalence of amputations is high among the individuals with locomotor disabilities. It warrants the attention of health authorities for planning and investments in rehabilitation of amputees for promoting research for indigenous state of the art prosthesis for integration in society. The data outcome could have been better if the study could have included data from multiple centers catering person with disability. The study sample contains data from tertiary center for certification, which can easily miss data from population which is not aware of benefits of disability evaluation. There is a need for creation of a central data bank with details of amputees for further studies for better data and planning.

**Declarations**

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 Ethical approval: From ethic committee

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