

## ORIGINAL ARTICLE

## Epidemiology and pattern of limb amputations at a private hospital in Owerri, Imo State, South-East Nigeria

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Received: October 26<sup>th</sup>, 2015Accepted: May 14<sup>th</sup>, 2016

DISCLOSURES: NONE

## ABSTRACT

**Background:** Amputation of either the upper or lower extremities in man presents a special public health challenge due to the problems associated with patients' rehabilitation.

**Objective:** To determine the epidemiology and pattern of limb amputations in a private medical setting in Owerri, Imo State.

**Methodology:** This was a 5-year retrospective epidemiological study of a total of 251 patients who had amputations between 2006 and 2010.

**Results:** Out of 251 patients studied, 166 (66.14%) were males while 85 (38.86%) were females. Lower limb amputations (LLA) occurred more frequently (189) than upper limb amputations (ULA) (62) in the ratio of 3:1. The age group with the highest rate of amputation (LLA) in both sexes was 41-60 years (64%). Trauma was the most common reason for upper limb amputations (75.8%), while peripheral vascular disease was the most frequent indication for lower limb amputation (49.8%). The occupational group with the highest rate of amputation was the commercial motor cyclists (33.9%), followed by commercial drivers (21.5%). The pattern of amputation showed that digits/toes amputations were the most frequent procedures (35.1%) followed by below knee/below elbow amputations (27.2%).

**Conclusion:** Amputations were more in the males of the productive age range, and most of them were in the lower limbs. Trauma was the most frequent indication for limb amputations. This has a far-reaching effect on family and state economy.

**Keywords:** Diabetes mellitus, trauma, peripheral, vascular disease

## INTRODUCTION

Human limbs are sometimes removed either deliberately to save life, or forcefully/accidentally through trauma. This procedure, which is termed amputation in medicine, is usually associated with psychosocial trauma. In certain traumatic conditions like severe road traffic accidents, a limb can be so badly damaged that all efforts to save it would fail.

Studies in Nigeria have reported trauma as the most common indication for amputation in many centres.<sup>1,2,3,4,5</sup> However, some other studies have shown diabetic complications as a high ranking cause of amputation in some parts of Nigeria.<sup>6,7,8,9,10,11</sup> A 15-year review by Thanni and Tade showed a variation in indications for amputation between the northern and southern parts of Nigeria.<sup>12</sup> Whereas trauma was reported to be the leading indication for amputation in southern Nigeria, the activities of traditional bone setters with resultant gangrene, is the leading indication in northern Nigeria.<sup>13</sup> Irrespective of the reason, amputation presents a peculiar problem to the patient, his family, and society at large, considering the inherent difficulties encountered with psychosocial and physical rehabilitation.

Studies have shown that more males are affected by amputation than females.<sup>5,11,14</sup> This is probably due to the fact that males are involved in activities which are more prone to trauma from road traffic accidents, falls from heights, assaults, sports, etc.

The present study was, therefore, designed to determine the epidemiology and pattern of limb amputation in the study area with a view to developing effective rehabilitation measures that will be of public health importance.

## METHODOLOGY

**Study Area:** This study was conducted at Christina Specialist Hospital, Egbu, Owerri, which is one of the few privately owned orthopaedic hospitals in the South-East of Nigeria. The catchment areas include Anambra, Abia, Rivers and Ebonyi States.

**Study Design:** This was a 5-year retrospective epidemiological study involving 251 patients who had amputation surgeries between 2006 and 2010. Their case notes were pulled from the Medical Records Department of the hospital after due permission had been sought for and obtained from the hospital authorities. Information extracted include biodata, age, sex, occupation, type and reason for amputation

**Statistical Analysis:** Data obtained were analysed using simple statistical instruments such as mean, percentage and ratios.

## RESULTS

The results showed that the age group with the highest incidence of amputations (Table 1) was the 41-60year group (56.6%), followed by the 61-80year group (37.5%). Out of 251 amputations, 166 (66.1%) were males while 85 (33.2%) were females, giving a male:female ratio of 2:1 (Table 2). The occupational group with the highest rate of amputations was the commercial motor cyclists 85(33.9%), followed by commercial drivers 54 (21.5%), see Table 3.

Trauma accounted for 47 (75.8%) of all upper limb amputations (ULA) followed by congenital deformities 6 (9.68%), see Table 4. On the other hand, perivascular disease accounted for 125 (66.1%) of all lower limb amputations (LLA) followed by trauma 49 (25.9%), see Table 5. The pattern of amputations (Table 6) shows that hand / fingers and digits/toes were the most frequent procedures 49(19.5%) and 39(15.5%), respectively, followed by below elbow 35(13.9%) and below knee 35(13.9%) amputations.

Table 1. Age distribution of amputee patients treated at Christina Specialist Hospital, Owerri between 2006 and 2010

Age Group (years)	Frequency	Percentage (%)
1-20	5	2
21-40	10	3.98
41-60	142	56.6
61-80	94	37.4
<b>Total</b>	<b>251</b>	<b>100</b>

Table 2. Sex distribution of amputee patients treated at Christina Specialist Hospital, Owerri between 2006 and 2010

Gender	Frequency	Percentage (%)
Male	166	66.1
Female	85	33.9
<b>Total</b>	<b>251</b>	<b>100</b>

Table 3. Occupational distribution of amputees treated at Christina Specialist Hospital Owerri

Occupation	Frequency	Percentage (%)
Commercial motorcyclists	85	33.9
Commercial drivers	54	21.5
Factory workers	36	14.3
Climbers	50	20
Civil servants	26	10.4
<b>Total</b>	<b>251</b>	<b>100</b>

Table 4. Reasons for upper extremity amputations at Christina Specialist Hospital, Owerri

Reasons for Amputation	No. of Cases	Percentage (%)
Trauma	47	75.8
Congenital deformity	6	9.68
Tumour	5	8.06
Perivascular Disease	4	6.45
<b>Total</b>	<b>62</b>	<b>100</b>

Table 5. Reasons for lower extremity amputations at Christina Specialist Hospital, Owerri

Reasons for Amputation	No. of Cases	Percentage (%)
Trauma	49	25.9
Congenital Deformity	6	3.17
Tumour	9	4.76
Perivascular Disease	125	66.1
<b>Total</b>	<b>189</b>	<b>100</b>

Table 6. Pattern of upper and lower limb amputations at Christina Specialist Hospital Owerri

Upper Limb	Level	Males	Females	Total	
Upper Limb	Shoulder Disarticulation	1	0	1	
	Above elbow	16	9	25	
	Elbow Disarticulation	0	3	3	
	Below elbow	17	18	35	
	Wrist Disarticulation	10	7	17	
	Hand/Finger	38	11	49	
	Lower limb	Hip Disarticulation	1	0	1
		Above knee	19	13	32
		Knee Disarticulation	10	2	12
		Below knee	21	14	35
Ankle Disarticulation		1	1	2	
Foot/Toes		32	7	39	
<b>Total</b>	<b>166</b>	<b>85</b>	<b>251</b>		

## DISCUSSION

This study revealed that the majority of amputees in the study area are males in the productive age group. Previous studies reported similar findings.<sup>1,11,15,20</sup> This has far reaching effects on the economy of both the family, and State at large, since males are most often the bread winners of their families in our part of the world. The loss of a limb presents an added burden on the family as

the cost of rehabilitation may be out of reach for most families. The fact that the lower limb was more involved in amputation than the upper limb had previously been reported.<sup>11</sup> It is believed that the upper limb has better vascularity than the lower limb which is more often involved in trauma considering the ambulatory and weight bearing functions of the lower limb.

The study, also, showed that the age group with the highest rate of amputations was 41-60 years. This represents the productive segment of the population. This group, also, represents the period when human activities are significantly high, with the increased risk of trauma from road traffic accidents, falls from height and gunshot injuries. Some previous studies reported lower peak age incidences.<sup>4,14,17</sup> The variation may be due to the hospital setting used for the study since most of the studies were teaching hospital based where patients' often present on referral.

Trauma was the most frequent indication for upper limb amputations (ULA) and the peak age incidence was 21-44 years, while peripheral vascular disease was the most frequent indication for lower limb amputations (LLA) with a peak age incidence of 41-60 years. The role of trauma in limb amputations has been previously reported by authors in other geopolitical zones of Nigeria. For instance, in South-West Nigeria, Olaseinde, *et al*, reported that trauma was responsible for 73.4% of all amputations, whereas, in South-South Nigeria, Ekekere reported that trauma accounted for 76.5% of all amputations.<sup>2,3</sup>

A study by Onuminya, *et al*, also corroborated the report of trauma as a common indication for amputation in Nigeria.<sup>5</sup> Common causes of trauma in the study area included fatal motor traffic accidents, falls from height, and crimes leading to gunshot wounds. These may be minimized by the construction of good road networks, reduction of crime rates by more job creation, and effective policing of the society.

The higher incidence of amputations in commercial motorcyclists and drivers may be explained by the fact that these people are more exposed to trauma by RTAs than many other people in the society. Some of them are illiterate, and barely understand or respect road signs, and some of them drive under the influence of drugs including alcohol, and in this part of the world, roads are often in poor state of maintenance.

The victims of these incidents often patronize the traditional bone setters in preference to orthodox facilities where their injuries would be properly and promptly managed.<sup>5,13</sup> Presentation to these bone setters is due mostly to their low charges, and sometimes, ignorance on the part of these injured persons. Such people frequently end up with complications and present late to hospitals when the limb may no longer be salvageable.

Previous authors have reported on the activities of traditional bone setters in Nigeria.<sup>5,18,19,24</sup> In Western countries, trauma plays a less important role as an indication for amputation; rather, peripheral vascular diseases play greater roles and even when they occur, the victims are promptly taken to the appropriate hospitals where facilities exist for optimal care, leaving no room for complications, or the subsequent need for amputations.<sup>16,20,21</sup>

The high incidence of peripheral vascular diseases as indication for lower limb amputation in the study area highlights the role that diabetes has recently played in the area as most of the cases were due to diabetic complications. Previous studies had documented diabetic gangrene as a leading cause of amputations in Nigeria.<sup>11,23</sup>

It was also found that the most frequent pattern of amputation in the study was digital amputation, followed by below-elbow/below-knee amputations. Ideally, this makes the prospects of rehabilitation brighter, but in actual fact, many of these amputees end up becoming beggars in the churches or mosques due to poverty and ignorance.

Furthermore, there are inadequate/ill-equipped rehabilitation centres to take care of the population of people who need rehabilitation. This is where the government and wealthy citizens have greater roles to play by establishing well-equipped centres to cater for these victims.

## CONCLUSION

Amputation surgery was performed more in males than females in the study and was mainly due to trauma. This presents a public health problem since rehabilitation centres are few and ill-equipped and amputees hardly access them due to high costs or ignorance.

## ACKNOWLEDGEMENT

The authors are grateful to the management and staff of Christina Specialist Hospital Egbu Owerri, Imo State for their total cooperation throughout the study.

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