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Lower Limb Amputation at a Tertiary Hospital in Maiduguri, Nigeria: A 10-Year Retrospective Survey

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Abstract

Background: Lower limb amputation is a psychologically devastating and ominous event that portends poor survival due to loss of function, sensation and change of body image. The incidence is on the rise in Nigeria with huge negative impacts on sufferers.

Objective: The aim of this study was to ascertain lower limb amputation types and causes, socio-demographic distributions of this condition, and cases referred for Physiotherapy intervention at a tertiary hospital in Nigeria.

Methods: This study was a 10-year retrospective review of lower limb amputations performed at a tertiary hospital in Nigeria from 1st January 2004 to 31st December 2013. A purposive sampling technique was used to select case records of lower limb amputation cases managed at the aforementioned facility.

Results: A total of one hundred and thirty-six case notes of persons with lower limb amputation were retrieved and reviewed over the 10 year period. Male (66.9%) amputees were in preponderance, and mean and age and range (in years) of the patients reviewed were 55.71 ± 3.54 and 3-90 respectively. Twenty-two amputee patients in the age group of 57-74 years were in majority. Diabetic neuropathy was the most important indication for lower limb amputation in this study. Below knee amputations constituted a vast majority (63.2%) of the level of amputation in our study. Only 10.3% of amputee patients with lower limb amputation were referred for physiotherapy management.

Conclusion: Physiotherapy referral for persons with amputation by first contact general practitioners was poor. It is imperative to create awareness on the role of physiotherapy amongst general practitioners involved in amputation care.

Keywords: Amputation; Incidence; Nigeria; Tertiary care centers

Introduction

Amputation is a dramatic, life altering event that typically results from either disease or trauma [1]. A lower limb amputation is the complete loss in the transverse anatomical plane of any part of the lower extremity [2]. It is a devastating experience that renders the individual less mobile and vulnerable to loss of independence [3] and occurs as a result of a wide range of diseases and trauma is associated with significant morbidity, mortality and disability and can lead to disability, joblessness, high insurance payments and a poor quality of life [4]. Amputation is a psychologically devastating episode and is generally viewed as an ominous event that portends poor survival [5,6], loss of function and sensation, as well as loss or change of body image. The cause of lower limb amputation is multi factorial and can be as a result of trauma, malignancy, disease or congenital anomaly [7].

Global incidence of lower limb amputation is difficult to obtain, due to little attention it receives in countries with low survival rate [1]. In a study by Moxey and colleagues [8], incidence of all forms of lower extremity amputation was reported to be in the ranges of 46.1 to 9600 per 105 in the population with diabetes compared with 5.8–31 per 105 in the general population. Major amputation ranges from 5.6 to 600 per 105 in the population with diabetes and from 3.6 to 68.4 per 105 in the total population [8]. However, significant global variation exists in the incidence of lower limb amputation with ethnicity and social deprivation playing significant roles [8].

Increase in the incidence of lower limb amputation has been reported in all races. However, blacks are twice more likely to have a lower limb amputation as a result of vascular disease than other races [9].

In Nigeria, there is paucity of data on lower limb amputation. In addition, documented data on the national prevalence of this

devastating condition is seemingly not available for referencing. Few available, regional based published review studies in the country focused mainly on case incidence and types, without any consideration for number of cases referred for physiotherapy which is the bedrock of rehabilitation of amputees [10-12].

Olasehinde et al. based their review on indications for amputation in Ile-Ife, South Western Nigeria reported that trauma was the most important cause of Lower limb amputation [10]. Enweluzo et al. in Lagos also a South-western city in Nigeria reviewed the pattern, types, indication, mortality and morbidity associated with amputation [11]. In their study, Ekere, in 2003 reviewed extremities amputation in Port-Harcourt, a southern cosmopolitan city in Nigeria and identified the incidence, indications and limb status at surgery [12]. Ajibade and colleagues in 2013 in a north western Nigerian study reported that lower limb amputations exceeded upper limb amputations. The commonest indication was trauma followed by TBS gangrene and malignant tumours [13]. Similarly, Kidmas et al. reviewed the pattern of lower limb amputation and preventable causes in Jos, North Central Nigeria and reported Trauma, diabetic foot sepsis and malignant conditions of the limb as the main indications for LLA [14]. To the best of our knowledge based on extensive literature search, few studies were identified in our region (North Eastern Nigeria). A study conducted by Umar et al. in 2004 explored the role of inappropriate bone splintage in limb amputation [15]. Abbas and colleagues in 2007 reviewed the changing pattern for amputations in a tertiary hospital in Maiduguri, North Eastern Nigeria and identified Trauma as the highest indication for amputations with below knee amputation as the commonest amputation identified [16].

These few identified published studies from our clime reviewed limb amputation in general unlike our study which focused on lower extremity amputation. Moreover, the timeline for our study fell within the insurgency era in the North Eastern Nigeria, especially in Borno State where Maiduguri is situated. The insurgency era was marked with traumatic events such as bomb explosions, gun shots and other forms of terror attacks. We therefore envisaged an upsurge in lower limb amputation due to trauma. The study was designed to review types and causes of lower limb amputation selected socio-demographic distributions of this condition, number of cases referred for Physiotherapy intervention at the tertiary hospital in Maiduguri, as well as the trend in the occurrence of the event over the 10 years of review.

Methods

Methods study design

This study was a retrospective review of cases of lower limb amputation seen and managed at the University of Maiduguri Teaching Hospital (UMTH), Maiduguri, Nigeria. A purposive sampling technique was used for the study.

Study setting

This study was conducted at the University of Maiduguri Teaching Hospital, a tertiary health institution located in Maiduguri, a North Eastern Nigerian city.

Study protocol

All case folders and registers of patients with lower limb amputation from 1st January 2004 to 31st December 2013 at the central library of the Medical Records Department and Physiotherapy Departments of the tertiary health institution were retrieved and reviewed.

Data collection procedure

Ethical Review Committee of the University of Maiduguri Teaching Hospital (UMTH), Maiduguri, Nigeria gave approval for the study. Official permission was obtained from the heads of Departments of physiotherapy and Medical Records to enable the researchers have access to registers and folders/case files of patients with lower limb amputation seen and managed at the hospital between 1st January, 2004 and 31st December 2013. The following information was extracted from the registers and folders retrieved: type of lower limb amputation, indication for amputation, socio-demographic characteristics of the patients such as Patient's age, Gender, Occupation, Marital status, number of cases of lower limb amputation referred for physiotherapy over the 10 year period and the trend in the occurrence of lower limb amputation for the period reviewed.

Data analysis

Descriptive statistics of mean, standard deviation, percentages, frequency tables and graph were used to summarize the data. This data summary was performed utilizing Statistical Package for Social Sciences (SPSS), (Windows Version 19.0, Chicago, IL, USA.).

Results

A total of 136 case notes of patients with lower limb amputation were retrieved and reviewed over the 10 year period hospital between 1st January, 2004 and 31st December. 2013. Males (66.9%) were in preponderance and mean age of these patients was 55.71 ± 3.54 years with age range of 3-90 years. The case notes revealed that the patients in the age group of 57-74 years were in majority (30.9%) and those that engaged in blue collar jobs dominated (36.0%) the occupational group. Under the marital status, the case notes reviewed showed that the married persons were mostly (67.7%) affected in the lower extremity amputation. lower limbs amputation below the knee was in preponderance (63.2%). Table 1 summarizes these data. Figure 1 illustrates that Diabetic neuropathy predominated (39.4%) as and indications of lower limb amputation in our study.

Variables	Frequency (N)	Percentage (%)
Age group (years)		
20-Mar	22	16.2
21-38	27	19.9
39-56	36	26.5
57-74	42	30.9
≥75	9	6.6
Gender		
Male	91	66.9
Female	45	33.1

Occupation		
White collar job	15	11
Blue collar job	49	36
Retiree	7	5.1
House wife	23	16.9
Others	42	30.9
Marital status		
Single	40	29.4
Married	92	67.7
Widowed	4	2.9
Levels of Amputation		
Above knee	50	36.8
Below knee	86	63.2

Table 1: Socio-demographic variables of people with limb amputation.

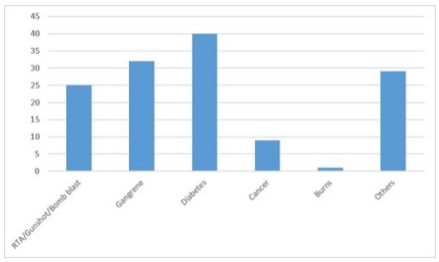

Figure 1: Indications for lower limb amputation.

Only fourteen patients (10.3%) that had lower limb amputation in the period under review were referred for physiotherapy management (Figure 2).

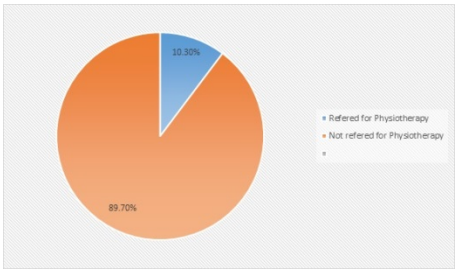

Figure 2: Referral for physiotherapy management.

The trend of occurrence in lower limb amputation was highest in the year 2010 over the 10 year period reviewed (Figure 3).

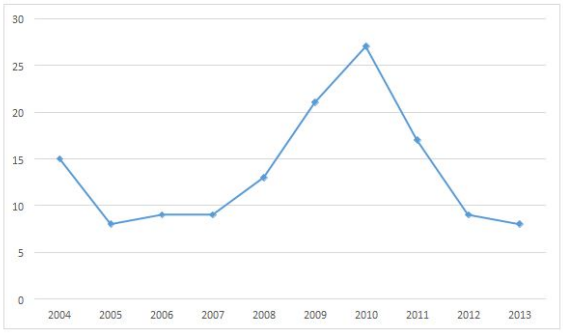

Figure 3: Evolution in lower limb amputation along the 10 years studied.

Discussion

University of Maiduguri Teaching Hospital (UMTH) a major referral tertiary hospital in Northeastern Nigeria over the years has been faced with management of complications of limb injuries arising from treatment of limb fractures and injuries by the Traditional Bone Setters (TBS).

Lower limb amputation remains one of the most common surgical procedures. The incidence is on the rise in Nigeria mainly due to increased prevalence of uncontrolled diabetes complicated by neuropathy and diabetic gangrene [17].

In our study, diabetes mellitus neuropathy was found to be the leading indication for amputation which further corroborates the reports of previous researchers [9,18,19]. This observation in our study may be connected to the significant increase in the prevalence of Type 2 Diabetes Mellitus (T2DM) in Sub-Saharan Africa from <1% recorded in some countries in the 1960s to a regional prevalence of 4.3% in 2012 as compared with a current global prevalence of 6.4% [20]. Also, in Nigeria, the knowledge of diabetes mellitus and its symptoms among the patients is quite low, and these patients often ascribe related diabetic symptoms to "curses or spiritual attacks". Furthermore, urbanization with adverse changes in life styles and diets, with inappropriate patients' education on foot care, as well as poor health-seeking behaviour have been identified as contributory factors to the preponderance of lower limb amputations caused by diabetes complications [21]. Secondly, the cost of diabetes care is borne in most instances by individuals and often payment for medical care is "out of pocket" as a result of poorly functional national health insurance scheme. Hence, most patients cannot afford medical care for diabetes, and these factors play pivot roles in increasing the prevalence of uncontrolled diabetes complicated by neuropathy and diabetic gangrene [17] that may subsequently lead to amputation. However, our study is antipodal to previous studies in Northern Nigeria that reported advanced squamous cell carcinoma [22], gangrene arising from fractures and injuries poorly managed by traditional bone setters and healers [15], and trauma [16] as the common leading causes of lower limb amputation.

This study showed males had more incidence of amputation than females. This finding is in consonance with previous study by Enweluzo et al. [11] that reported a 7:1 amputation male to female ratio. This may be attributed to the fact that the prevalence of diabetes

mellitus is higher in male gender than in female. In addition, in our clime, males being mainly the bread winners seem to be more involved and exposed to hazardous activities in the course of making a living. These activities invariably, may predispose them to traumatic injuries involving the lower extremities which might lead to amputation.

Below knee amputations constituted a vast majority of the level of amputation in our study. This agrees with previous studies [17,23-26]. However, Onyemaechi et al., reported a higher prevalence of above knee amputations in their study [27]. It is generally observed that traumatic injuries occur more in the lower limbs (mostly below the knee); and also diabetic gangrene (probably due to diabetic foot) starts distally from the foot and move proximally to the knee, and it is most often arrested surgically before reaching the knee. Thus, the validation of this observation.

Amputation was found to be most common in the age group 57-74 years. This observation is in tandem with previous studies [27,28]. The complications of diabetes that eventually lead amputation are more common in the aging populace.

Incidence of lower limb amputation was at its peak in the year 2010 for the 10 years period reviewed in this study. This is not unexpected as the year 2010 marked the climax of attacks in Borno State (where Maiduguri is situated) by the boko haram insurgency [29]. These attacks undoubtedly increased the rate of traumatic amputation, and therefore augmented the total incidence of amputation at that period. Also, the insecurity situation from 2009-2011 might have coerced inhabitants of the surrounding towns and villages to flee to Maiduguri, and this inadvertently might have put a tremendous loads of patients on the UMTH.

The result of cases referred for physiotherapy management under the period of review was very poor. This corroborates a study by Manickum et al. in a South African study that reported low referral of amputees for Physiotherapy management [30]. Despite the huge role of Physiotherapy in rehabilitation of patients after lower limb amputation, the referral is low from our study. Balogun et al. [31] opined that the greatest challenge facing physiotherapists in Nigeria is educating the masses and other healthcare providers on the role of physiotherapy in health care delivery. Jackson [32] identified lack of or poor knowledge about a profession may lead to misconceptions about the profession, and probably gives rise to inter-professional conflicts that may ultimately lead to poor referral for physiotherapy. Thus, poor awareness of the role of physiotherapy in health care delivery may adversely influence utilization of Physiotherapy services [31].

Conclusion

Lower limb amputations were mostly performed on middle-aged to older males and the most common indication was diabetes neuropathy. Creation of awareness on the leading causes of lower limb amputation identified in this study should be strengthened. Physiotherapy referral for amputees by first contact general practitioners is poor. Hence, awareness on the roles of physiotherapy in the management of amputation should be sacrosanct.

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