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A Retrospective Review of Indications and Complications of Extremity Amputations in LAUTECH Teaching Hospital, Ogbomosho, Nigeria.

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Abstract

Background information

Major amputations are not without their devastating post-operative complications which may include challenges with wound healing, wound infection, the disturbing phenomenon of phantom limb pain, and psychosocial problems to mention a few. It becomes imperative to find out the associated indications and complications.

Methodology

This is a retrospective hospital-based study of 75 unilateral extremity amputations done between 2018 and 2022 in LAUTECH Teaching Hospital, Ogbomosho, Oyo state. Case notes of the patients were retrieved from the hospital's Records department. Information about their sociodemographic characteristics, indications for amputation, the level

of amputation, complications after surgery, and others were obtained from their records using a well-structured proforma.

Result

The age of the patients ranged between 5 to 80 years and the mean age is 46.7 years. The majority in terms of education had secondary school certificates (34%). Also, out of Seventy-five (75) patients with unilateral amputations. 58 (77.3%) of them were male and 17(22.7%) were female with male to female ratio of 3.4: 1. In addition. 29(38.7%) and 28(37.3%) patients had below-knee amputations and above-knee amputations respectively. The most common indication for amputation is trauma i.e. 34.67% (26 patients) followed by diabetic foot gangrene seen in 17 (22.67%) patients. Traditional bone setter (TBS) gangrene was the culprit in

12(16%) patients. Peripheral vascular disease was the indication in 11(14.7%) patients while tumours were the cause in 6 (8%) patients.

Conclusion and Recommendation

Trauma is the leading indication for amputation in our study. This affects the productive population of any society. Therefore, there is a need to implement multi-sectoral measures that target the behaviors of commercial drivers and riders. Stringent rules and regulations must be enforced on the use of our roads by various agencies saddled with the responsibility.

Keyword

Amputation, trauma

INTRODUCTION

Amputation is the severance of the whole or part of a limb through the bone, while disarticulation is cutting a limb through a joint. It is one of the oldest surgical procedures, dating back to 1700 BC, when it was used to punish offenders and for therapeutic purposes¹⁻². In the practice of modern Orthopaedics, the procedure is still relevant today.

This surgery is inevitable in situations of failed salvage limb procedures, life-threatening conditions in cases of dead or dying limbs, and also in patients where the use of prosthesis is judged to be better especially in 'damn nuisance' limbs⁴. Traditionally, amputation can be classified as major or minor.

Major extremity amputations constitute amputations above the ankle and wrist in the lower and upper limbs respectively. On the other hand, minor amputations involve amputations below the wrist and ankle.

It is usually difficult for patients to accept amputation even when it is life-saving as no one wants to lose any part of his or her body³. Major amputations constitute great psychological, economic, physical, and social burdens for the patients, especially in developing countries^{7, 8}. Stigmatization towards amputees in our society and the inability to procure prostheses which could have given them hope are other reasons. In most cases, prostheses are either not readily available or very expensive when they are available. Indications for amputation vary from country to country and region to region within a country.

The most common indication for amputation in the Western world is peripheral vascular disease^{9, 10}. However, in Nigeria, studies from various centers have identified different leading causes of extremity amputations including traditional bone setters' (TBS) gangrene^{11, 19}, trauma^{5, 12,13,14,15} and diabetic foot gangrene^{16, 17, 18}.

Major amputations are not without their devastating post-operative complications which may include challenges with wound healing, wound infection, the disturbing

phenomenon of phantom limb pain, and psychosocial problems to mention a few. Understanding these untoward events following surgery may help to treat them appropriately when noticed to improve the quality of life.

It becomes imperative to find out which of these indications is currently prevalent in our center as well as the complications associated. This will in turn help to establish public healthcare strategies to reduce the rate of preventable amputations thus reducing morbidity, mortality, and adverse economic implications caused by major amputations.

METHOD AND MATERIAL

A retrospective hospital-based study of 75 unilateral extremity amputations was done between 2018 and 2022 in LAUTECH Teaching Hospital, Ogbomoso, Oyo state. Case notes of the patients were retrieved from the hospital's Records department. Information about their sociodemographic characteristics, indications for amputation, the level of amputation, complications after surgery, and others were obtained from their records using a well-structured proforma. Some of the patients were contacted on the phone when clarifications were necessary. Complete data was entered into Statistical Package for Social Sciences, version 23. Descriptive analysis was done using tables.

RESULTS

The age of the patients ranged between 5 to 80 years and the mean age was 48.7 years (Standard Deviation = 21.2). 18.3% had no formal education, while 20% had tertiary education and 34% and 21.3% had secondary and primary education respectively as shown in Table 1. Seventy-five (75) patients in total had unilateral amputations within the period considered. 58 (77.3%) of them were male and 17(22.7%) were female with male to female ratio of 3.4: 1 (M: F = 3.4:1).

Table 2 shows that 29(38.7%) patients had below-knee amputations, a number that is almost the same as 28(37.3%) individuals who had above-knee amputations. Other types of amputations as stated in the table included below and above the elbow, shoulder disarticulation, and amputations in the foot.

The most common indication as stated in Table 3 is trauma which constituted 34.67% (26 patients) followed by diabetic foot gangrene seen in 17 (22.67%) patients. Traditional bone setter (TBS) gangrene was the culprit in 12(16%) patients. Peripheral vascular disease was the indication in 11(14.7%) patients while tumours were the cause in 6 (8%) patients. Other indications like chronic leg ulcer, lymphedema, and snake bite were indicated in one person each.

DISCUSSION

There was male preponderance in the study with a male-to-female ratio of 3.4: 1. This is similar to results in many other studies^{5, 11, 18, 19}. This may be attributed to the propensity of males to engage in risky activities such as overloading their motorcycles, non-use of crash helmets, and riding on busy trunk A road than their female counterparts as reported by Amole et al²⁰. The prevalence of amputations in males was reported in many studies in Nigeria. The mean age was 46.7 years which was close to what Salawu et al¹⁹ and other studies reported. There were two major peaks in the age group of the patients; the first one was in the 2nd to 3rd decades of life where trauma was the culprit and the 2nd peak was in the 5th decade of life where diabetic foot gangrene, and peripheral vascular disease were seen more. The bimodal distribution was reported in many Nigerian studies^{12, 13}.

In our study, the most common indication was trauma seen in 26(34.67%) patients. In these patients, the trauma either caused vascular compromise or mangled extremities necessitating amputation. This result may not be unconnected with the fact that the use of commercial motorcycles is a major means of transportation in Ogbomoso with the incidence of motorcycle road traffic accidents as high as 49.5% reported by Durodola et al²¹ in 2015. This high incidence

was attributed to various risky behaviors of the motorcyclists like overloading, non-use of crash helmets, and riding on trunk A roads as reported by Amole et al²⁰. Furthermore, the LAUTECH Teaching Hospital, Ogbomoso is located along a trunk A road that daily witnesses heavy traffic flow especially for trucks traveling to the northern region of the country, and the hospital is known to provide trauma care for the majority of the victims of road traffic crash along this road. All these may explain why trauma was the leading indication for amputation in our study. The finding is similar to what was reported in many Nigerian studies^{5, 8, 12 - 15}

Diabetic foot gangrene was the second most common indication seen in 17 patients in our study. Studies by Inyang et al²² and Enweluzo et al¹⁸ reported diabetic foot gangrene as the most common indication for amputation in Uyo and Lagos respectively. Some of these patients presented to the hospital with diabetic foot gangrene without prior diagnosis of diabetes mellitus while others developed the complication after years of diagnosis.

We found Traditional Bone Setter (TBS) gangrene to be the third most common indication for extremity amputation. Salawu et al¹⁹ reported TBS gangrene as the most common indication of major amputation in a study carried out in the Northern

part of Nigeria. Several factors adduced to this finding are the preference of the majority of the population for TBS care over Orthodox medical care, high level of poverty, low educational status, and availability of few Orthopaedic surgeons relative to the population¹⁹. The story is not different from ours only that the majority of the patients studied have one form of education or the other.

Ranked closely behind the TBS gangrene is a peripheral vascular disease seen in 11 patients (14.7%). Many of these patients are elderly people with significant impedance to arterial blood flow to the lower limbs as seen on their Doppler ultrasound. Peripheral vascular disease (PVD) is known to be the leading indication for amputation in the Western world, however, as the aging population in Nigeria is increasing; this may be on the increase in the future.

Fifth on the list of indications was malignant tumours of the extremity reported in only 6 (8%). Others include chronic leg ulcers, lymphedema, and snake bites seen in only one patient each.

The majority of amputations, 84%, were done in the lower limbs while only 16% were done in the upper limb. A similar finding was reported in most previous studies. Concerning the levels of amputation, the most frequently performed were below-the-knee and above-the-knee

amputations with the former (29 patients) being slightly higher than the latter (28 patients). This varies in different studies. Above the elbow amputation is the distant third commonest then followed by the below the elbow and shoulder disarticulation.

The post-operative complication rate in our study was 54.7 % which is higher than the 31.1% reported by Ajibade et al⁵ and lower than the 73.9% reported by Akiode et al¹⁵. We found wound infection to be the most common complication in our study. This is not different from what was reported by many studies^{5, 13, 15}. 18 patients (43.9%) developed wound infection in the post-operative period. This is followed by wound dehiscence in 10 patients (24.4%) and flap necrosis in 8 patients (19.5%). Other less common complications in the study include phantom limb, severe depression, and bone overgrowth in a child.

CONCLUSION

Trauma is the leading indication for amputation in our study. This affects the productive population of any society. Therefore, there is a need to implement multi-sectoral measures that target the behaviors of commercial drivers and riders. Stringent rules and regulations must be enforced on the use of our roads by various agencies saddled with the responsibility. Furthermore, Public enlightenment is also required to

educate people about complications
of diabetic mellitus and the

detrimental activities of traditional
bone setters in our environment.

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Table 1. Socio-Demographic Characteristics of Patients

Variable	Frequency	Percent
Sex		
Male	58	77.3
Female	17	22.7
Age		
1 - 9	4	5.3
10 – 19	2	2.7
20 – 29	7	9.3
30 – 39	14	18.7
40 – 49	12	16.0
50 – 59	10	13.3
60 – 69	14	18.7
70 – 79	5	6.7
>80	7	9.3

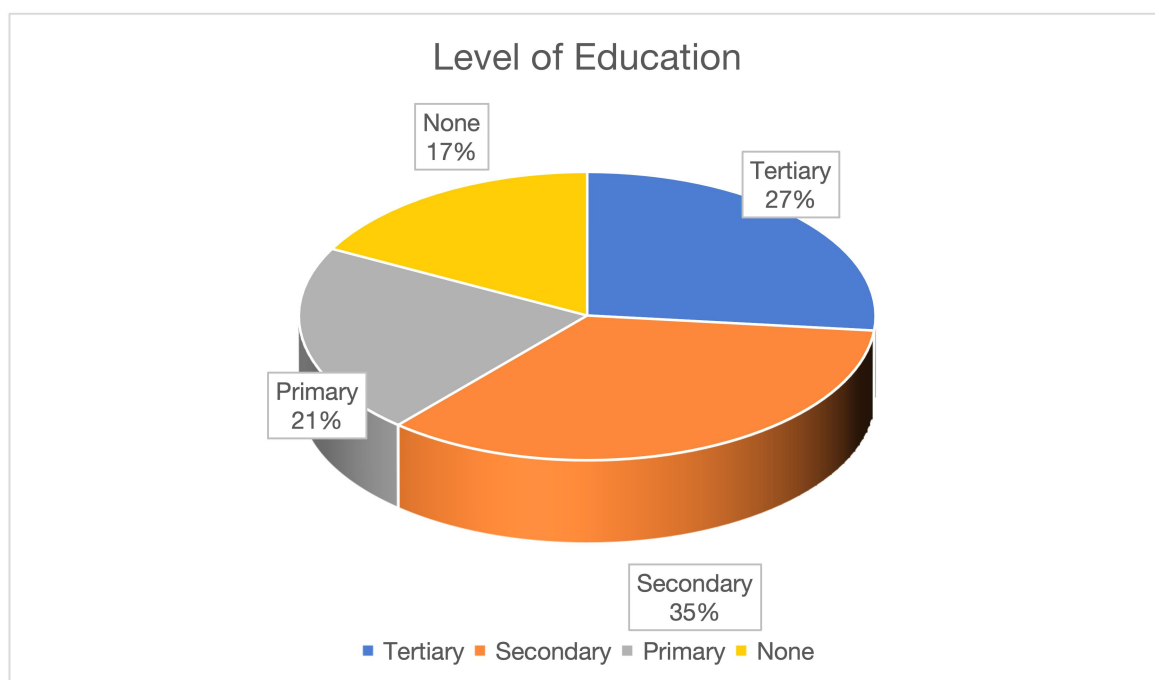


Figure 1: Level of Education of the Patients

Table 2 – Level of Extremity Amputation

Types of amputation	Frequency	Percent
Below Knee	29	38.7
Above Knee	28	37.3
Above Elbow	8	10.7
Amputations in the foot and toes	6	8.0
Below Elbow	3	4.0
Shoulder Disarticulation	1	1.3
Total	75	100

Table 3 – Indications for Amputation

Indications	Frequency	percent
Trauma	26	34.7
Diabetic foot gangrene	17	22.7
TBS gangrene	12	16.0
Peripheral vascular diseases	11	14.7
Tumours (malignant)	6	8.0
Chronic leg ulcer	1	1.3
Lymphedema	1	1.3
Snake bite	1	1.3
Total	75	100

Table 4 Complications due to Amputation (n=41)

Complications	Frequency	percent
Wound infection	18	43.9
Wound Dehiscence	10	24.4
Flap necrosis	8	19.5
Phantom pain	2	4.9
Depression	2	4.9
Bone overgrowth	1	2.4
Total	41	100