



Lower Limb Amputations: Study of Indications in Hospitals in South Eastern Nigeria

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ABSTRACT

Several indications have been documented as causes of limb amputation. Indications of limb amputation are similar worldwide; however, the magnitude of each indication varies as a result of demographic and socioeconomic distributions. In Africa and most developing countries including Nigeria, trauma is the leading cause of lower limb amputations. To describe the causes of lower limb amputations in Aba and Owerri, Nigeria. Records of all patients that underwent lower limb amputation in two private hospitals in Aba and Owerri between January 1st 2005 and December 31st 2009 were examined retrospectively. There were a total of 122 cases of lower limb amputations. Major indications were trauma (73%), infections (42%) and vasculopathies (19%). Trauma indications dominated as indication of lower limb amputation for all age groups except for the 61-80 years age group where vasculopathies was the leading cause (64%). Trauma is the leading cause of lower limb amputation for this study. Therefore reducing the incidence of these trauma occurrences could reduce the general level of lower limb amputation.

Keywords: Amputation, Lower limb, Trauma, Vasculopathy, Tumour, Infections, Aba, Owerri.

Incidence of amputations, especially limb amputations is on the rise in Nigeria mostly as a result of increased road traffic accidents and avascular complications (Obalum and Okeke 2009). Worldwide, causes of limb amputations are similar, but the magnitude of each of the indications vary depending on the area, period of study, sex and age (Sethia et al 1986, Yakubu et al 1995; Ephraim et al 2003, Kidmas et al, 2004; Settakorm et al 2005, Thani and Thade 2007).

In Africa, trauma is one of the leading causes of amputation (Ogengo et al, 2009) and Nigeria is not left out of this trend (Ekere 2003; Kidmas et al 2004, Akiode et al 2005, Abas and Musa 2007).

Worthy of mention in Nigeria is the presence of complications of traditional healer's management of musculoskeletal disorders as one of the indications of limb amputation (Yakubu et al 1995 Yakubu et al 1996, Onuminya 2005, Thanni and Tade 2007; Obalum and Okeke 2009).

However, studies on limb amputation in the south East of Nigeria are scarce or inexistent to the best of our knowledge. Therefore, this study is aimed at investigating lower limb amputation in Owerri and Aba, South East Nigeria and to attempt correlation between variables.

MATERIALS AND METHODS

The study was conducted in two private hospitals in Owerri and Aba, both in the South Eastern region of Nigeria. The two hospitals were Christiana Hospital in Egbu Oweri, Imo State and Horstman Hospital in Aba, Abia State.

Records of all patients that underwent amputation in these hospitals between January 1st 2005 and December 31st 2009 were examined retrospectively. Ethical permit for use of the patient's records were obtained from the hospital's ethical committee. All the cases were classified into 20-year age groups as follows: 1-20, 21-40.....61-80. Causes of amputation were classified as vasculopathies, trauma, infection, tumours and congenital defects.

Data were presented using tables and charts. Descriptive statistics were used to determine means and frequencies and to compare variables.

RESULTS

A total of 166 cases of limb amputation were undertaken within the study period in the hospitals chosen for the study. Lower limb amputation made up 73.5% (n = 122) of the total limb amputations. 58% (n = 71) of lower limb amputations occurred in males as opposed to 42% (n = 51) in females.

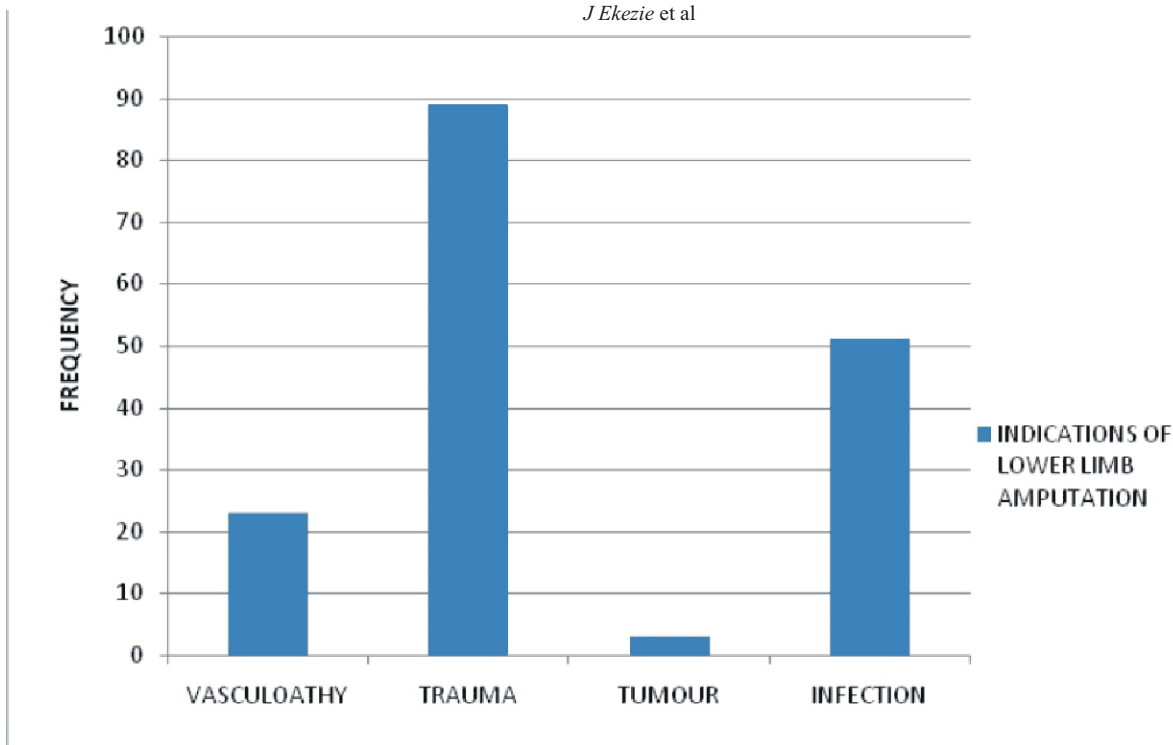


Fig. 1: Indications fo Lower Limb Amputation

From the present study, four indications were identified for lower limb amputation. Fig. 1 shows the proportional distribution of these indications with trauma having the largest proportion, followed by infections, then vasculopathies. While tumours had the least indication. These indications were observed to occur as either the sole cause of lower limb amputation or in combination with others. The mean age for vascular amputations was 48.76 ± 10.16 . For trauma amputations, it was 36.57 ± 4.84 . For infection related amputations, the mean age was 33.25 ± 6.65 while for tumour related amputations, it was 43.83 ± 31.97 .

Table 1 below shows the 20-year-interval age-specific distribution of lower limb amputation according to the indication for amputation. Trauma amputations had the highest frequency over all other indications for all the age groups except for the 61-80 years age group where vasculopathies had the highest frequency. Infection occurred in 51 out of the 122 cases of lower limb amputations. However, most of this occurred together with either vasculopathies or trauma. Amputations due to tumour had the least frequency. No case of lower limb amputation was associated with congenital limb loss/defect.

Table 1: Age Specific Distribution Of Lower Limb Amputation According to Indications For Amputation

Age	Vasculoathy	Trauma	Tumour	Infection
1-20	1	9	0	7
21-40	7	48	1	30
41-60	8	28	2	14
61-80	7	4	0	0
Total	28	89	3	51

Some Indications Occurred In Combination With Others, Hence, The Total Was More Than 122

Fig. 2 displays the age specific proportional distribution of lower limb amputation indications. For patients 1-20 years of age, 75% of amputations were due to trauma; 58% were due to solely infections or in combination with other indications while only 8% were due to vasculopathies. For 21-40 and

41-60 year age groups, a similar pattern was observed. However, for patients 61-80 years of age, a change of trend occurred. 64% of limb amputations for this age group were as a result of vasculopathies, while the remaining was due to trauma.

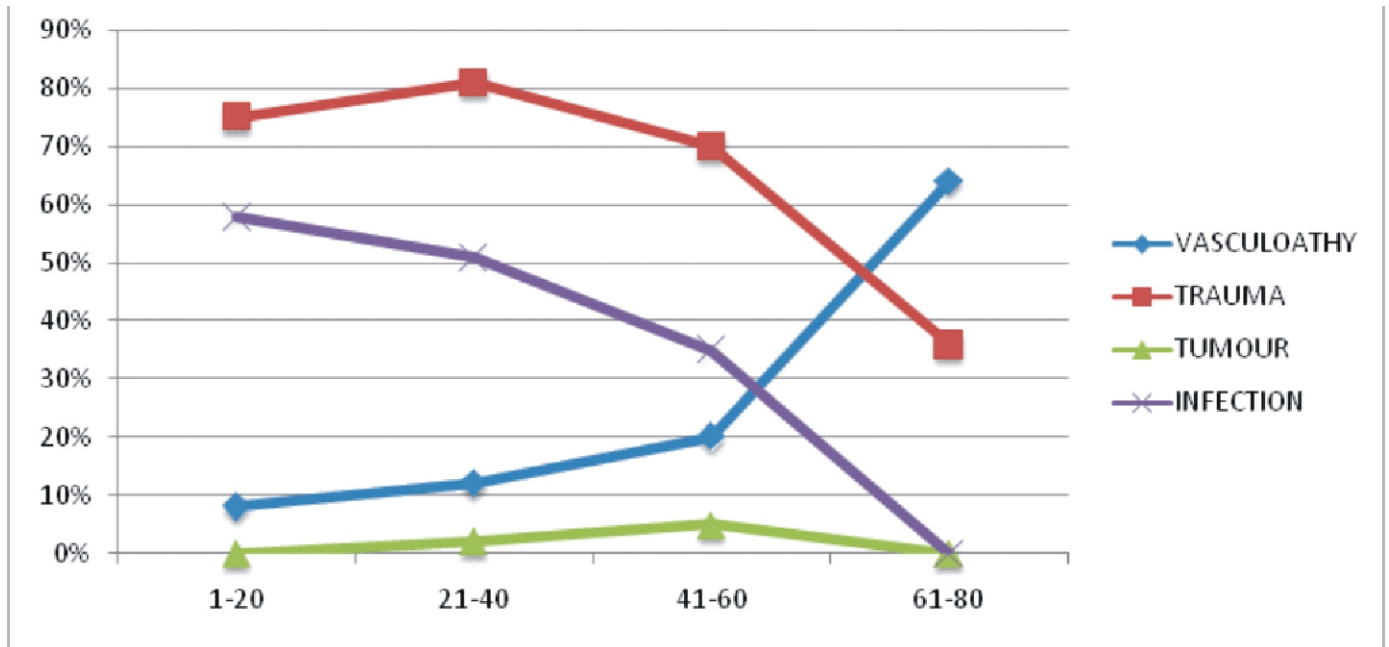


Fig. 2 Age Specific Proportional Distribution of Lower Limb Amputation Indications

There was a proportional increase in amputations due to vasculopathy as one goes up the age groups among the patients ($R = +0.88, p = 0.12$). Conversely, there was a proportional decrease in amputations related to infections ($R = -0.98, p = 0.14$), and trauma ($R = -0.82, p = 0.18$) up the age group, though these findings were not significant.

Comparing the 21-40 and 61-80 year age groups, 81% of amputations in the 21-40 age group were due to trauma while vasculopathies contributed only 12% of amputations. In the 61-80 age groups, the reverse was the case. While 36% of amputations were due to trauma, 64% were due to vasculopathies ($p < 0.001$)

DISCUSSION

Our study shows that trauma had the highest indication for lower limb amputation for all age groups except the 61-80. Trauma has been found to be the leading cause of limb amputation in various studies conducted in Africa (Ekere 2003, Kidmas et al 2004, Akiode et al 2005, Ogengo et al 2009) and other parts of the developing world. However, Akhator

(2007) posited that vasculopathies was the leading cause of lower limb amputation in Eku, Delta State, Nigeria. Another study in Maiduguri stated that tumours were the leading cause of amputation, however a later study highlighted trauma as the leading cause of trauma in that same area (Abas and Musa 2007). However, in most developed countries, trauma related amputations are low and decreasing (Dillingham et al 2002).

Trauma related amputations from the present study had its amplitude among patients 21-40 years of age. This is in agreement with previous studies in this part of the world (Yinusa and Egbeye 2003, Ogengo et al 2009). This age group has been found to be most vulnerable to musculoskeletal injuries as a result of road traffic accidents, falls and gunshots (Obalum 2008). Also, from our study, out of a total of 59 cases of amputations in this age group, 51% had infection complications. Therefore, a more critical care approach should be focused on this age group which, constitute the most active workforce of a population.

Generally, the present study shows that amputation as a result of infection complications, either primarily (due to osteomyelitis) or secondary (due to trauma and vasculopathies) was very high (42%), this could suggest possible late presentation and poor wound management. For instance, studies have indicated that poor post-fracture splintage could have resulted in limb gangrene necessitating limb amputation (Yakubu et al 1995, Yakubu et al 1996, Onuminya 2005). These studies argue that most musculoskeletal injuries are treated by traditional healers who utilize poor splintage practices in their management and complicate these injuries, resulting to limb gangrenous infections and consequently, amputations.

Though the present study does not have data on the influence of poor management of musculoskeletal injuries including post-traditional-fracture-splintage complications, our high proportion of infection related amputations could reflect poor management of musculoskeletal injuries necessitating amputations. Further research should therefore be conducted to confirm this. In the meantime, proper management of sepsis and proper public health enlightenment of the masses on the gains of early medical presentation of injuries and pathologies should be put in place.

While vascular amputation is high in developed countries, it is low in developing countries like Africa (Ebskov 1991, Rommers et al 1997, Loro and Franceschi 1999, Thani and Tade 2007, Ogengo et al 2009) with vascular amputations contribution 17% of all amputations in Kenya (Ogengo et al 2009) while in the United States, a similar study showed that vascular amputations contributed to 82% of all amputations and increased from 38% per 100,000 people in 1988 to 46.19 per 100,000 people in 1996 (Dillingham et al 2002). The present study shows that vascular amputations were 19% of all limb lower limb amputations. This is therefore in agreement with that for Kenya, another African country (Ogengo et al 2009).

However, increasing trend in the incidence of cardiovascular risk factors in sub-Saharan Africa (Akinboboye et al 2003) could translate to increase in vascular amputation in this region in the future. This therefore calls for

more attention on cardiovascular pathologies.

CONCLUSION

The indications for lower limb amputation for Aba and Owerri include Trauma, infections, vasculopathies and malignancies, with trauma being the leading cause. There were also a high proportion of infection related limb amputations. Though vascular amputations were low, increasing incidence of cardiovascular pathologies in Africa could yield a corresponding increase in vasculopathy related amputations in the future

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