

**AFRICAN JOURNAL OF
MEDICINE
and medical sciences**

VOLUME 30, NUMBER 3, SEPTEMBER, 2001



**EDITOR:
B. O. OSOTIMEHIN**

**ASSISTANT EDITOR:
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ISSN 1116 — 4077

The scope of amputations in a Nigerian teaching hospital*

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Summary

In developing countries, amputations have been performed due to trauma and infections; whereas in developed countries, trauma, diabetes and peripheral vascular diseases are the usual indications. Current practice in Nigeria suggests a change of relative indications, hence, this study. A five-year (July 1994 to June 1999) review of amputation records from the medical records, operating theatre, wards and physiotherapy department was carried out retrospectively. Amputation types, age, sex and indications were analysed. Fifty-eight amputations were performed in 56 patients (47 males, nine females, M:F = 5.2: 1, age range 7-70 years, mean $33.3 \pm S.D. 18.2$). There were 42 lower and 16 upper limbs. Trauma accounted for 48.3%; followed by diabetes (29.3%), tumours (12.1%), infections (8.6%) and one indeterminate cause (1.7%). There was bias for sex, age and type of extremity as trauma was the commonest indication in male patients aged 30 years and below (and in the upper limb) whereas diabetes predominated in female patients above 30 years (and in the lower limb). Infection, as an indication for amputation, has now become a rear guard indication. Diabetes, previously uncommon, now appears in the forefront. These findings call for early detection and aggressive management of diabetic foot lesions.

Keywords: Amputation, Nigeria, Teaching hospital

Resume

Dans les pays sous-développés, les amputations sont très souvent pratiquées due au trauma et aux infections; alors que dans les pays développés, le trauma, les diabètes et les maladies vasculaires périphériques sont très indiqués. La pratique courante en Nigeria suggère un changement des indications relatives, d'où le but de cette étude. Une revue (Juillet 1994 à Juin 1999) de unq aus des dossiers des amputation a partir des rapports médicaux, salle d'opération, salle d'hospitalisation et des département physiothérapie a été faite rétrospectivement. Les types d'amputations, l'âge, le sexe et les indications ont été analysés. 58 amputations ont été faites sur 56 malades (47 hommes, 9 femmes, H:F = 5,2:1, âge 7-70 ans moyenne $33.3 \pm S.D. 18, 2$). Il y avait 42 membres inférieurs et 16 supérieurs. Le trauma était responsable de 48.3%, suit du diabète (29.3%) les tumeurs (12.1%), les infections (8.6%) et un cas indéterminé (1.7%). Il y avait un penchant pour le sexe. L'âge le type d'extrémité bien que le trauma était la cause la plus indiquée chez les hommes âgés de 30 ans (sur les membres supérieures) alors que le diabète prédominant chez les femmes se plus se 30 ans (sur les membres inférieures) l'infection comme indication pour l'amputation est maintenant devenue une petite garde indicative. Le diabète précédemment peu commun, apparaît maintenant sur le premier plan. Ces conclusions appellent des blessures du pied chez les diabétiques.

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Introduction

Amputation of the extremity is a distressing surgical option for patients in our environment where many will refuse the procedure until they sense that death is inevitable. In the series by Oyemade and Junaid [1], 69 patients who had osteosarcoma where the only option of treatment offered was amputation, 48% declined the procedure. Some patients believe that they would rather die and meet their creator 'complete' than consent to amputation. Nonetheless, surgeons in the developing countries have carried out amputations in consenting patients for various reasons ranging from trauma, tumours, infections and congenital malformations [1,2]. Peripheral vascular diseases and diabetes mellitus were previously uncommon indications for amputations in developing countries in contradistinction to the developed countries where these are prominent indications [3]. We have earlier on looked at lower limb (LL) amputations in a previous study, and found that there were more diabetes-driven than trauma-driven amputations in our practice. The aim of this study was to review the subject on a wider scope and to examine what the situation portends when all the extremities (upper and lower limbs) were considered.

Materials and methods

A retrospective review of patients who underwent amputations for various reasons between July 1994 and June 1999 at the University of Ilorin Teaching Hospital, Ilorin, Nigeria was done. Patients' records were obtained from the medical records department, operating theatre, orthopaedic wards and the physiotherapy department. The data obtained were analysed into age, sex, types of amputation done and the indication and whether or not there was any use of prostheses post-operatively. The results were tabulated and interpreted.

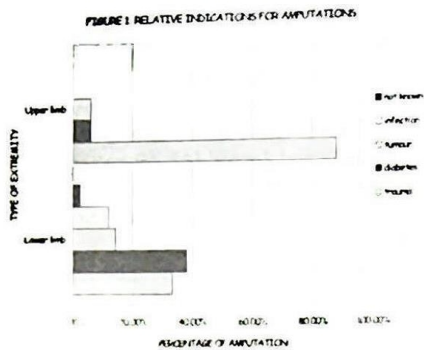
Results

There were 56 patients in all, 47 males and nine females (M:F = 5.2: 1), but 58 amputations. The age range was 7-70 years with a mean of $33.3 \pm S.D. 18.2$ years. Two patients had 2 serial amputations in the LL. Trauma was the highest indication in 28 of the 58 amputations (48.3%), followed by diabetes in 17 of 58 (29.3%), tumour (7 of 58, 12.1%), infections (5 of 58, 8.6%) and 1 patient in whom the indication could not be extracted from the case notes due to missing data (1.7%), Table 1. No patient had congenital malformations or peripheral vascular diseases. Trauma was responsible for most of the UL amputations (88%, Figure 1), more than half of which was due to road traffic accidents. Some other 3 patients had gangrene of the fore arm from badly managed fractures from traditional bonesetters, 2 additional patients had occupational injuries including a boy who dipped his hand in a bread-making machine and another boy in a grinding

*This paper was presented at the 38th Nigerian Surgical Research Society conference held at Obafemi Awolowo Teaching Hospital, Ile Ife on 2nd and 3rd December 1999. 35th International College of surgeons conference (Nigerian National sections) held in Port Harcourt from March 29 to April 1, 2000.

Table 1: Relative indications of amputations in each extremity

Extremity	Trauma	Diabetes	Tumour	Infection	Not known	Total
Lower limb	33.3%	38.1%	14.3%	11.9%	2.4%	100%
Upper limb	80.0%	6.0%	6.0%	0%	0%	100%



macchine. Two patients sustained electricity burns with gangre-nous fingers. Most of the trauma amputations were performed in the first four decades, Figure 4. Trauma accounted for 33.3 % in LL amputations while diabetes was responsible for 6 % UL and 38.1 % LL amputations, Figure 1. Tumours were the third commonest indication for amputation in our series including both soft tissue and bone tumours, all in seven patients—squamous cell carcinoma (2 patients), fibrosarcoma (2), osteosarcoma (1), malignant melanoma (1), and Kaposi sarcoma (1). Six of these were in the LL while one of the fibrosarcomas was in the UL. There was no infection-driven amputation in the UL, Figure 1. In all instances, infection was fourth in the sequence of indications, trailing trauma, diabetes and tumours, Figure 2.

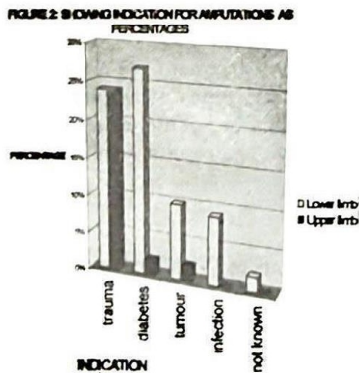


Table 2: Relative indication for amputations as percentage of total

Extremity	Trauma	Diabetes	Tumour	Infection	Not known	Total
Lower limb	24%	27%	10%	9%	2%	72%
Upper limb	24%	2%	2%	0%	0%	28%
Total	48%	29%	12%	9%	2%	100%

Most of the amputations were done in the second, third and fifth decades—three modes, Figure 3. The majority of the UL amputations were in patients in their second decade while majority of the LL amputations were patients in their third decade. There was no UL amputation after the fifth decade (Figure 3). Diabetes mellitus is found in all decades except the first whereas trauma is uncommon after the fourth decade (Figure 4).

FIGURE 3: No OF EXTREMITIES AMPUTATED AND AGE GROUPS OF PATIENTS

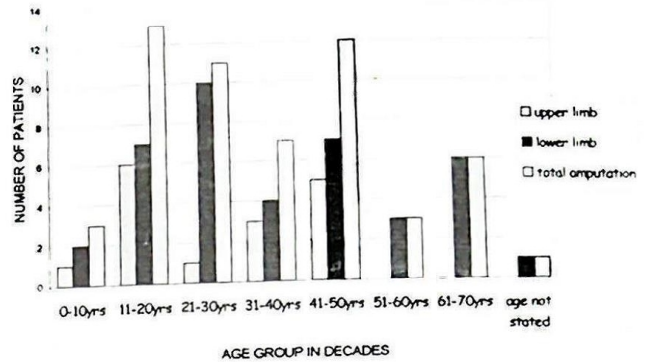
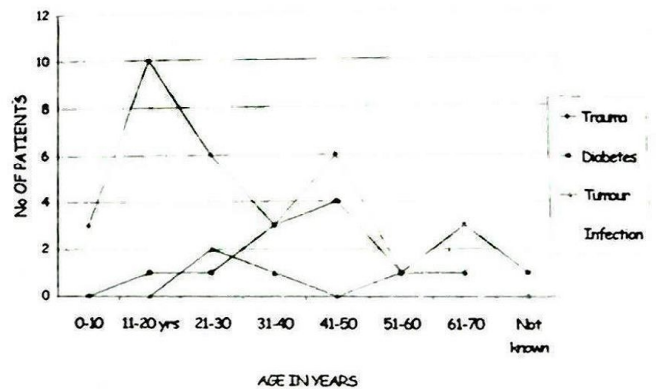


FIGURE 4: INDICATIONS FOR AMPUTATIONS AMONG DECADES



Major joints were sacrificed in both the UL (the elbow in eleven out of the sixteen, 68.8 %) and LL (the knee in sixteen of the forty-two, 38.1 %) amputations. Only 4 patients (7.0 %, 1 in the UL and 3 in the LL) got prostheses.

Discussion

The preponderance of males over females in developing country amputees as reported by Onuba and Udoidio [2] in their paper on UL and LL amputations in 36 patients over a five-year period was also found in this review. A marked difference, however, was the extremity amputation rate. Onuba and Udoidio [2] reported a 50 % amputation rate for each of UL and LL; this series revealed less of UL (28 %) and more of LL (72 %) amputation rate (Table 2). Indeed, most of the reports on amputation around West Africa were on the LL only [4, 5, 6]. Contrary to a widely held opinion that trauma and infections were responsible for amputations in the developing countries [1,2], this series has shown that only trauma still remains a significant indication. Trauma was responsible for nearly half (48 %) of the amputations, Table 2, showing greater proportion in indication for UL amputation. Trauma has been blamed as the most important cause of morbidity (and mortality) in persons 40 years and below all over the world [7,8]. The effect of trauma on the extremities is reflected in trauma-driven amputation. The need to prevent UL trauma and thus reduce the amputation rate becomes inevitable especially as regards occupational injuries. There should be better designs of machines that would not admit the hand into the grinding chamber and an enforcement of the legislation against child labour as seen in these children who work

with machines. The role of traditional bonesetters in contributing to the extremity gangrene complicating LL fractures cared for by them has been noted by Katchy *et al.* [4] In the ten-year series, 25 % of the entire study population of 120 patients, had fractures mismanaged by the bonesetters and eventually needed amputation in the orthodox hospital. In this series, it appears more of an UL problem in only 3 (5.2 %) of our amputation patients.

The age distribution of the patients is illustrative of the variation of indications for amputation among the different age groups. The high proportion of diabetes-driven amputation after the third decade is comparable to the diminishing frequency of trauma-driven amputation after that decade. The diabetes patients lacked proper foot care—a single, most important control measure in preventing foot infection and gangrene [9]. Therefore, the aphorism “give diabetes an inch and it will take a foot” by Dr Lording [10] from Victoria, Australia, becomes a useful warning calling for aggressive management of diabetic foot lesion. This can be adequately achieved by employing a multidisciplinary clinic approach [11] and foot care and hygiene [9], Jamieson and Ruckley [3] and other workers [12] have shown that establishment of a vascular unit significantly lowers the LL amputation rate among diabetic patients. Revascularization also reduces the length of hospital stay and the overall cost of hospital care [12].

The effect of losing the elbows and knees can be appreciated when it is realised that our rehabilitation using prosthesis is inadequate. The 7.0 % prosthesis use in this series is comparable to the 7.5 % reported by Katchy *et al.* [4] from Enugu, Nigeria. Therefore, rehabilitation of amputees from developing countries demands great improvement since the prosthesis use in the developed countries is 60-90 % [13].

The low frequency of bone tumours leading to amputation in this series is in agreement with the findings of Oyemade and Junaid¹ in 1982. This still suggests that primary malignant bone tumours are an uncommon indication for amputation in our environment compared to the developed countries [1] However, this study showed that tumours are a commoner indication for amputation than infections. Oyemade and Junaid [1] suggested that improved general health and socio-economic conditions were the reasons for the rising tumour rate. Perhaps, these factors have also lowered the infection rate and hence, infection-driven amputation in the developing countries. Infection had no role in the UL but accounted for 11.9 % of the LL amputations and 9 % overall (Tables 1 and 2).

Conclusions

It appears that infections have been relegated to the background probably because of better health awareness, improved nutrition and availability of antibiotics and antiseptics and by a concomitant increase in those diseases—diabetes and tumours—associated with improved socio-economic development and longevity. This perhaps explains the present

situation where these two indications have increased in incidence and have pushed infection from a prominent slot shared with trauma to a background position. Tumours are now as common an indication as infections. However, trauma is still the commonest indication for amputation especially in the UL.

Acknowledgements

The contributions of some of my colleague surgeons, surgical residents and heads of departments of medical records and physiotherapy, and the theatre matron all of the University of Ilorin Teaching Hospital Ilorin, are acknowledged with thanks. Dr. K O Onawola and Dr. L O Abdur-Rahaman were helpful with data gathering.

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