Current Indications for Extremity Amputations in Maiduguri, North-East Nigeria: A 6-year Retrospective Review

Theophilus Maksha Dabkana, Friday Titus Nyaku¹, Stanley Tella Bwala¹
Department of Orthopaedics and Trauma Surgery, University of Maiduguri Teaching Hospital and College of Medical Sciences, University of Maiduguri,¹Department of Orthopaedics and Trauma Surgery, University of Maiduguri Teaching Hospital, Maiduguri, Borno, Nigeria

Abstract

Objective: To know the commonest cause for extremity amputation in UMTH in recent times, following the result of two previous studies citing malignancy and later trauma, at the University of Maiduguri Teaching Hospital, a tertiary hospital in North East Nigeria. Method: We retrieved folders of all patients who had extremity amputation from January 2010 to December 2016 in our center. There were one hundred and sixty three case notes, accounting for one hundred and sixty five amputations. Results: Of the 165 amputations in 163 patients, 94 (57.0%) were as a result of this problem. It was also noted that the affected patients were regular with their medications, bringing into question the efficacy of these medications. Trauma however remains the second common cause for amputation, accounting for 22 (13.3%), followed by complications from splints of traditional bone setters (TBS) which accounted for 20 (12.2%). Conclusion: Complicated diabetes mellitus is the commonest cause of amputations in recent times in our center.

Keywords: Anti-diabetic medications, changing trends, complicated diabetes mellitus, lack of prostheses, major limb amputations

Résumé

Objectif: Connaître la cause la plus fréquente d’amputation des membres de l’UMTH ces derniers temps, suite au résultat de deux études antérieures sur la malignité et les traumatisms ultérieurs, à l’hôpital universitaire de Maiduguri, un hôpital tertiaire du nord-est du Nigeria. Méthode: Nous avons récupéré les dossiers de tous les patients ayant subi une amputation des membres entre janvier 2010 et décembre 2016 dans notre centre. Il y avait cent soixante-trois notes de cas, représentant cent soixante-cinq amputations. Résultats: Sur les 165 amputations chez 163 patients, 94 (57,0%) étaient à la suite de ce problème. Il a également été noté que les patients affectés étaient réguliers avec leurs médicaments, ce qui remettait en question l’efficacité de ces médicaments. Le traumatisme reste cependant la deuxième cause fréquente d’amputation, avec 22 (13,3%), suivi par les complications des attelles des osters traditionnels (TBS) qui en représentaient 20 (12,2%). Conclusion: Le diabète sucré compliqué est la cause la plus fréquente d’amputations ces derniers temps dans notre centre.

Mots-clés: Absence de prothèses, amputations majeures des membres, diabète sucré compliqué, évolution des tendances, médications antidiabétiques.

Introduction

Before 2004, trauma had accounted for most amputations in most hospitals including University of Maiduguri Teaching Hospital (UMTH), followed by malignancies and complication from Traditional bone setters (TBS) splints.[1,2] Current trends, however, show a different pattern of causes in UMTH despite the insurgency that has ravaged the North East. This study highlights this.
**Objective**
The objective of this study is to show that complicated diabetes mellitus is the most common cause for extremity amputation in our environment and sub standard drugs are to be blamed.

**Methods**
The case notes of patients who had amputations from January 2010 to December 2016 were retrieved and analyzed after obtaining permission from the Ethics Committee of the hospital. Data obtained from these folders were analyzed.

**Results**
One hundred and sixty three case notes with 165 amputations were analyzed. There were 130 males and 33 females, giving a male to female ratio of 3.9:1. Peak incidence was in the 3rd to 5th decades, accounting for 89 patients (55.3%), [Figure 1]. Lower extremity amputations accounted for 143 amputations in 141 patients, (86.7%), as compared to 22 (13.3%) upper extremity amputations. In the lower extremity amputations, below knee procedures did account for 111 procedures in 109 patients, (77.6%), while in the upper limbs, above elbow accounted for more procedures 19 (79.2%), [Table 1]. Complicated diabetes mellitus accounted for most indications with 94 amputations in 92 patients (57.0%), followed by trauma which accounted for 22 patients(13.3%), splint complication from traditional bone setters (TBS) with 20 cases (12.2%), tumor with 12 cases (7.3%), peripheral vascular disease 8 (4.8%), clostridial infections (gas gangrene) 7 (4.3%), iatrogenic 1 (0.6%) and complicated lymphoedema 1, (0.6%), [Table 2].

There were nine deaths in all, five (55.6%) occurring in patients with complicated diabetes mellitus, two (22.2%) in patients with peripheral vascular disease, complicated by hypertensive heart disease, and 1 each (11.10%) in trauma and tumor. The International Committee of the Red Cross provided lower limb prostheses for 42 patients (25.9%); 35 below knee and 7 above knee, while 8 patients (4.9%) sourced their prostheses at the National Orthopaedic Hospital (Enugu and Kano), all below knee, leaving 112 amputees (69.2%), without any form of prosthesis. No patient had upper limb prosthesis from our records.

**Discussion**
Most of the patients who had amputation in this study were males, with a male-to-female ratio of 3.9:1. This agrees with results from many centers. This is not unconnected with the fact that males are more outgoing compared to females in our environment and therefore are more prone to trauma.[4]

The most common cause of amputation in the recent times in our hospital is complicated diabetes mellitus This is shown in Table 1. This also correlates with other studies in the country and some Middle East countries.[3-7] Most of the patients had Type II diabetes mellitus, aged 30–50 years [Figure 1]. We noted that, though most of the patients took their medications regularly and as prescribed, the sources of these medications (tablets and injections) were questionable. There were more men than women with complicated diabetes mellitus, (78 men and 16 women, giving a ratio of 4.9:1). This is surprising as trauma also shows a male preponderance. We have not categorically come out blaming substandard drugs as the cause of complicated diabetes. We are only asking questions as to why these patients have their disease complicated despite taking the prescribed drugs by physicians. Over 50% is attributed to one pathology is quite high and demands questions. There is a need therefore for proper monitoring of all drugs used for the treatment of diabetes mellitus, no matter

| Table 1: Indication for amputation |
|-----------------------------------|
| Indication                      | Number of patients | Number of amputations | Percentage |
| Complicated diabetes mellitus    | 92                | 94                   | 57.0       |
| Trauma                          | 22                | 22                   | 13.3       |
| TBS splint complication          | 20                | 20                   | 12.1       |
| Malignancies                     | 12                | 12                   | 7.3        |
| Peripheral vascular disease      | 8                 | 8                    | 4.8        |
| Gas gangrene                     | 7                 | 7                    | 4.3        |
| Complicated lymphoedema          | 1                 | 1                    | 0.6        |
| Iatrogenic (cannulation)         | 1                 | 1                    | 0.6        |
| Total                            | 163               | 165                  | 100        |

TBS=Traditional bone setters

| Table 2: Site and level of amputations |
|----------------------------------------|
| Site of amputation | Level of amputation | n (%) |
|---------------------|----------------------|-------|
| Lower limb          | Below knee           | 111 (77.6) |
|                     | Above knee           | 32 (22.4)  |
|                     | Total                | 143 (100)  |
| Upper limb          | Above elbow          | 18 (81.8) |
|                     | Below elbow          | 4 (18.2) |
|                     | Total                | 22 (100) |

Figure 1: Graph showing indications for amputations according to age

![Graph showing indications for amputations according to age](image-url)
Foot ulceration is a preventable condition where simple intervention can reduce amputations by up to 70% through programs that could reduce its risk factors.[10] Identifying the role of risk factors contributing to this condition will enable health providers to set up better prevention programs that could result in improving patient’s quality of life. One of such is peripheral arterial disease. This is a significant risk factor for diabetic foot disease that may lead to critical limb ischemia, lower extremity wounds, and limb loss in many patients[11]

- Others include hyperglycemia-impaired immunological response, neuropathy, and peripheral vascular disease as major predisposing factors leading to diabetic foot infection. It is well documented that diabetic foot infections are frequently polymicrobial in nature, occurring in 22%–66% of patients with diabetic foot ulcer[12]
- The medications available to diabetics also play an important role in preventing these complications. For example, a good number of the amputees were regular with their medications. Why then did they end up losing a limb(s)? Though not confirmed, the efficacy of these medications needs to be properly investigated by relevant bodies such as the National Agency for Food and Drug Administration and Control. There is a need for proper regulation in terms of importation of these medications. Storage and quality control, including distribution, must be monitored to avoid this emerging menace, especially injections (insulin) that require special storage
- Local production may also help reduce cost of these drugs as most of the patients in our study resorted to traditional medications because of the high cost. A few however did this out of ignorance and local beliefs.

**CONCLUSION**

Complicated diabetes mellitus appears to account for most amputations in our center in recent times despite most patients taking their medications regularly, most likely due to substandard drugs. We believe that the medical community should look into this as the situation is only getting worse. More patients need to have access to prostheses by establishing more centers that produce them.

All correspondences to: Theophilus M Dabkana, College of Medical Sciences, University of Maiduguri, Nigeria. theophilus_dabkana@yahoo.co.uk

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**Conflicts of interest**
There are no conflicts of interest.

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