

Original Article

The anatomic pattern of fractures and dislocations among accident victims in Owerri, Nigeria

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Abstract

BACKGROUND: Some studies have described the pattern of limb fractures and dislocation in Nigeria. However, with recent increase in vehicle and motorbike transport, we aimed to describe the pattern to note any differences from previous reports.

METHODS: This was a retrospective study of all patients with accidental fractures and dislocations treated at the Federal Medical Centre Owerri between January 2000 and December 2003.

RESULTS: A change in the major causative factors was observed as Road Traffic Accident (RTA) is now the major cause of injuries accounting for 72 percent of all cases. Fall from height was previously the major cause.

In adults the tibia was the most frequently fractured bone accounting for 28.9 percent of all fractures while the femur was mostly involved in children accounting for 35 percent of all fractures. Again, different from previous reports lower limb fractures occurred in over 70 percent of cases while upper limb fractures accounted for only 20 percent.

CONCLUSION: There is a major change in both the causative factors and pattern of fractures among accident victims in Nigeria.

Introduction

There has been a tremendous increase in the number of vehicles plying Nigerian roads¹. There has also been a marked increase in the number of teenage drivers. All these have resulted in an increase in both the absolute number and varieties of accident occurring on our roads².

The recent introduction of motorcycles as a commercial means of transportation has greatly impacted on both the frequency and anatomical distribution of fractures and dislocations among accident victims all over the country. When Ebong³ carried out a study of the patterns of fractures and dislocations in Western Nigeria, he reported that most of the injuries resulted from falls and then from road traffic accidents. In his series, fractures occurred more commonly in the upper limb than in the lower

limb. However in a more recent study, Archibong and colleagues⁴ reported that road traffic accidents were responsible for 50 percent of the fractures cases and that the femur was the most frequently affected bone. Owerri is the capital of Imo State, the Heartland of Eastern Nigeria. It is strategically located on the road between two important commercial towns of Aba and Onitsha. Therefore it experiences a lot of traffic. Its accessibility makes it a central point for the treatment of accident victims. This study is to determine the anatomical disposition of fractures and dislocations in relation to the causative factors among accident victims (both adults and children), treated at the Federal Medical Centre Owerri. The aim of this study excludes any description of the clinical management received by the patients.

Materials and Method

This is a retrospective study of all the accident cases admitted and managed at the Federal Medical Centre Owerri between January 2000 and December 2003. The case notes were retrieved and reviewed. The information extracted included Patient's age and sex. The nature of the fracture or dislocation was documented as well as the etiological agent. Associated soft tissue injuries were also recorded. Pathological fractures and soft injuries without fractures and dislocation were excluded from the study. X-ray studies were the most important investigative tool in all the patients.

Results

A total of 1050 patients were treated for fractures and dislocations within the study period. There were 672 males and 378 females with a male to female ratio of 1.8:1. Multiple fractures and combined fracture/dislocation were observed in some patients. For age incidence, most patients were in the third and fourth decades and 57% of the patients were in the age group (20-39).

The bones fractured are shown in table I.

Table 1 shows the frequency of involvement of the bones in fractures. Though the femur topped the table, it can be seen that the tibia is the most frequently affected bone in accidents because it accounted for 28.9 percent of fractures (i.e. alone and with fibula) The femur accounted for 21.6 percent of all the fractures. Among the upper limb bones the radius is the most affected bone accounting for 8.1% of the fractures followed by the ulna. The involvement of the other bones is as shown in the table. The maxilla was the least affected bone in this study. Table III Shows the frequency of fracture/dislocation involving the various joints of the body. The ankle joint is the most affected joint accounting for 41.9 percent of the cases. That will

Table IV: Pediatric fractures.

Bone	No	%
Femur	36	35.3
Tibia & Fibular	19	18.6
Tibia only	15	14.7
Radius & Ulna	7	6.9
Humerus	6	5.9
Mandible	3	2.8
Hand	8	
Clavicle	2	2.0
Ribs	2	2.0
Fibula	2	2.0
Pelvis	1	1.0
Radius	1	1.0
Spine	1	1.0
Ulna	1	1.0
Skull	1	1.0
Foot	1	1.0
Patella	1	1.0
Total	107	100

also add to the involvement of tibia and fibula in fractures. The hip and shoulder joints were the next most involved. Table IV shows the distribution of fractures among children aged 15 years and below. The femur accounted for 35.3 percent of the fractures being the most affected bone. It was closely followed by tibia, which accounted for 33.3 percent of the fractures. The lower limb bones were involved in over 70 percent of cases. In the etiology of fractures, Road Traffic Accident (RTA) was the most common, accounting for 72 percent of the cases. It was followed by fall from heights, 11 percent, gunshots 8 percent, assault 7 percent and domestic accident 2 percent.

Table 1 Distribution of fractures

Bone	NO(%)
Femur	118(21.6)
Tibia and Fibula	159(15.7)
	133(13.2)
Skull	61 (6.0)
Radius and Ulna	60 (5.9)
Humerus	58 (5.7)
Ribs	52(5.1)
Ribs	52(5.1)
Clavicle	49(4.8)
Mandible	49(4.8)
Pelvis	40(4.0)
Radius only	22(2.2)
Fibula only	22(2.2)
Hand	22(2.2)
Spine	19(1.9)
Foot	14(1.4)
Patella	13(1.3)
Ulna only	12(1.2)
Maxilla	8 (0.8)
Total	1011(100.0)

Table III Distribution of joint dislocation

Joint	NO	%
Hip	22	34.4
Shoulder	18	28.1
Ankle	12	18.7
Wrist	6	9.4
Elbow	3	4.7
Knee	3	4.7
Total	64	100.0%

Table III: The distribution of simple dislocation of joints without fractures of the adjacent bones. The hip is the most frequently affected joint, followed by the shoulder. The elbow and knee joints are the least affected

Discussion:

It has been previously demonstrated that the third decade (20-29years) is the most involved age group. This was the same finding in our study followed by the fourth decade. The two age groups account for over 57 percent of the all trauma victims. This is not surprising because they are the most mobile groups and so are at greatest risk of getting involved in accidents. The male: female ratio in this series was 1.8:1. This is lower than was noted in studies from other parts of Nigeria.^{6,8,9} The Igbo woman is as enterprising as the male and many are traders involved in traveling to purchase and/or sell their wares. Therefore the frequency of injury between the two genders will be very different. In the series reported by Ekong in 1978, fractures occurred more commonly in the upper limb than in the lower limb. This is different in this series and other more recent studies where the lower extremity is involved more than the upper extremity^{4,8}. This may be as a result of the change in the causative factor, while fall from height accounted for most of the fractures in earlier series, road traffic accident is now the major cause of accident related injuries. In previous or earlier reports patients usually fell on outstretched arms resulting in fractures of forearm bones. This was also the pattern in the reports from Saudi Arabia and United States.^{10,11} In a report from Germany, fractures of the distal radius accounted for 17 percent of all fractures.¹² while it was only 8 percent in our own series. Further more while road traffic accident accounted for only 14 percent of cases in the study by

Ebong, it accounts for 50 percent in Archibong's series and 72 percent in our own series. This may be due to the tremendous increase in the number of vehicles (mostly imported fairly used cars) plying the roads, poorly maintained cars and roads, and increase in the number of teenage drivers.¹ Another major factor is the introduction of commercial motor cycle transport.⁵ In a study of the severity and outcome of falls in children in Ile-Ife, Adesunkami³ report that lower limb fractures occurred in 45.6 percent while upper limb fractures accounted for 45.6 percent. In our series, lower limb fractures accounted for over 70 percent of cases while upper limb fractures occurred in only about 20 percent of cases. The ankle joint is the most commonly involved in fracture/dislocation while the hip joint is most affected in simple dislocations. Furthermore the rising incident of armed robbery cases and civil conflicts has elevated gunshots as a prominent cause of injury in this series.

Conclusion:

There has been a definite change in the cause of fractures/dislocations in this environment. Road traffic accidents have taken over from falls as the most common cause of accident derived injuries. This has also resulted in a change in the anatomical pattern of fractures. Lower limb fractures are now far more common than upper limb fractures even in children. In adults the tibia is mostly affected while the femur is fractured most in children.

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