

Prospective Study Of Limb Injuries In Calabar

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Abstract

A prospective study of limb injuries presenting at the University of Calabar Teaching Hospital (UCTH) to determine its pattern was undertaken from February 2005. This communication covers the first year of the study (February 1, 2005 to January 31, 2006). All patients with a history of trauma presenting at the Accident and Emergency Unit of UCTH were evaluated for limb injuries. Injury Severity Score was used to determine severity of injuries sustained. Data obtained was analyzed using EPI-INFO 2002 version.

A total of 2,129 emergencies presented at the Accident and Emergency unit of UCTH during the study period, out of which 649 (30.5%) were due to trauma. Out of the 649 trauma victims seen during this 12 months period, 223 (34.4%) of them sustained 262 limb injuries. Their ages ranged from 4 to 69 years, with mean age of 30.5 years and with 62.3% aged 20 – 39 years. The male to female ratio was 4.9:1.

One hundred and ninety nine limb injured patients (89.3%) sustained their injuries on the road. Road traffic accident was the leading cause of limb injuries (83.4%), with motorcycle accidents constituting 62.9% of these.

Most of these injuries affected the lower limbs (69%). Fracture was the most common limb injury sustained, accounting for 69.5% of cases with 53.3% of them being open. Fracture of the tibia/fibula (combined) was the most common (38.5%). Forty eight patients (21.5%) sustained multiple limb injuries. Head injury was the commonest associated injury (71.1%). Most of the limb injuries were treated non-operatively. The fractures were treated non-operatively in 65.8% of cases while operative methods were used in 34.2% of cases.

Eight patients died (3.6%) and head injury occurred in 5 (62.5%) of the mortalities.

Institution of appropriate road safety measures would significantly reduce the incidence of limb injuries.

INTRODUCTION

Limb injuries have a worldwide occurrence. Their increasing rate, especially accidental ones, can be attributed to modernization, industrialization and increased rate of violence in the society¹. Trauma is not only the leading cause of death but also the leading cause of functional disability in adults younger than 45 years of age². Recent reports from Nigeria indicate that injuries are fast taking over as the leading cause of disability and death in Nigeria, often described as a “hidden disease of epidemic proportion”³.

Limb injuries may involve the upper limbs or the lower limbs. It may occur in isolation or in association with injuries to other parts of the body and may result from road traffic accidents, falls, gunshot, industrial accidents, assault as well as sports. In fact, road traffic injuries are currently ranked ninth globally among the leading causes of disability adjusted life years lost, and the ranking is projected to rise to third position by 2020⁴. The importance of developing strategies to prevent these limb injuries cannot therefore be

overemphasized⁵.

This prospective study on the pattern of limb injuries, carried out at the University of Calabar Teaching Hospital, (UCTH), Calabar, is part of a wider prospective study on different types of trauma by the UCTH Trauma Research Group and covers the first twelve months of the study (1st February 2005 to 31st January 2006).

PATIENTS AND METHODS

This is an on-going prospective study, a component part of University of Calabar Teaching Hospital Trauma Research Group, which began on the 1st of February 2005. Approval for the study was obtained from the ethical committee of the University of Calabar Teaching Hospital (UCTH), Calabar.

Patients presenting with a history of trauma at the Accident and Emergency Unit of UCTH were evaluated for limb injuries based on a structured questionnaire, which included basic demographic data, mechanism and history of injury, associated injuries and management.

Physical examination of the patients was carried out to ascertain the nature and extent of limb injuries sustained as well as any associated injury. Severity of the injuries sustained was determined using the Injury Severity Score (ISS). Relevant laboratory and radiological investigations were requested for and evaluated. Initial and definitive treatments given the patients were also ascertained.

Data obtained between were analyzed using EPI-INFO 2002 computer software.

RESULTS

Two thousand one hundred and twenty nine (2,129) patients presented at the Accident and Emergency Unit of the hospital during the period of this study. Six hundred and forty nine (649) cases of trauma were recorded, constituting 30.5% of the total accident and emergency cases. Of the total trauma cases, two hundred and twenty three (223) patients (34.4%) sustained varying degrees of limb injuries constituting the largest single trauma group of all the different groups of trauma studied by the UCTH Trauma Research Group during this period.

The age of patients who sustained limb injuries ranged from 4 to 69 years, with mean age of 30.5 years. The majority of patients (62.3%) were aged 20 – 39 years. There were 185 males and 38 females with male to female ratio of 4.9:1 (Figure 1).

One hundred and ninety nine patients (89.3%) were injured on the road; 13 (5.8%) at home; two each (0.9%) at school, construction site, riot, factory, the bush and market respectively, while one patient (0.4%) was injured at sea.

Road traffic accident (RTA) was the leading cause of limb injuries accounting for 83.4% (186 patients). Assault caused limb injuries in 7.3% (16 patients); fall in 4.5% (10 patients), gunshot in 3.1% (seven patients), hit by falling tree in 1.3% (three patients) and sports in 0.4% (one patient) (Table I).

Figure 1

Table 1: Cause Of Injury

Cause of Injury	Number of Patients	Percentage (%)
Road Traffic Accident	186	83.4
Motorcycles	117	62.9
Motor Vehicles	37	19.9
Pedestrians	30	16.1
Bicycles	2	1.1
Assault	16	7.3
Fall	10	4.5
Gunshot	7	3.1
Hit by falling tree	3	1.3
Sports	1	0.4
Total	223	100.0

Most of the RTAs (117 cases – 62.9%) involved motorcycles; 65% of these were motorcycle riders. None of the motorcycle riders or passengers used crash protective helmet. Motor vehicles were involved in 37 cases (19.9%), pedestrians in 30 cases (16.1%) and bicycle in 2 cases (1.1%).

Two hundred and twenty three (223) patients sustained two hundred and sixty two (262) injuries involving 256 limbs. Forty-eight patients (21.5%) sustained multiple limb injuries. Most of the injuries (69%) affected the lower limbs.

Figure 2

Table 2: type of limb injuries.

Type of Injury	Number	Percentage (%)
Fractures	182	69.5
Soft Tissue Injuries	52	19.8
Dislocation	15	5.7
Fracture/Dislocation	5	1.9
Amputation	4	1.5
Tendon Injury	3	1.2
Epiphyseal Injury	1	0.4
Total	262	100.0

48 patients sustained multiple limb injuries

Fracture was the commonest injury sustained accounting for 182 cases (69.5%) with 53.3% of these being open fractures. Fracture of the tibia and fibula (combined) was the commonest type accounting for 70 cases (38.5%) (Table III).

Figure 3

Table 3: Distribution Of Fractures

Bone involved	Number	Percentage (%)
Tibia + Fibula (combined)	70	38.5
Femur	41	22.5
Humerus	27	14.8
Radius + Ulnar (combined)	11	6.0
Tibia only	8	4.4
Bones of the foot	8	4.4
Clavicle	4	2.2
Radius only	4	2.2
Ulnar only	4	2.2
Bones of the wrist/hand	2	1.1
Patella	2	1.1
Fibula only	1	0.6
Total	182	100.0

97 (53.3%) of these fractures were open.

Forty-five patients sustained associated injuries, and head injury was the commonest, occurring in 32 of these patients (71.1%). (Table IV).

Figure 4

Table 4: Associated Injuries

Associated Injuries	Number (n=45)	Percentage (%)
Head Injury	32	71.1
Spinal injury	5	11.1
Genito-urinary injury	4	8.8
Chest Injury	2	4.5
Maxillo-facial injury	2	4.5

2 patients with hypovolemic shock died

5 patients with severe head injury died.

1 patient with chest injury and hypovolaemic shock died

The highest Injury Severity Score (ISS) was 34 and least was

9.

The time interval between injury and presentation at the Accident and Emergency unit of the hospital ranged from 15minutes to 96hours, with mean of 7.6 hours (SD=18.2).

Standard resuscitative measures were carried out on the patients. The injured limbs especially those with fractures were initially splinted using appropriate splints. Non-operative treatment was the commonest method of definitive treatment used. This included use of external support materials like plaster of paris/scotch-cast for treatment of fractures (56.3%), and traction (9.5%). Open reduction and internal fixation (with either plates and screws or screws only or intramedullary nail or wiring) was the method of treatment of 20.3% of the fractures while external fixators (including Pin-in-Plaster) were used in 22 cases (13.9%). Dislocations were treated by closed reduction under anaesthesia and appropriate splintage. Thirty-nine patients (29.6%) left the hospital against medical advice to seek treatment elsewhere.

At evaluation by three months post-treatment, the patients with soft tissue injury, dislocation, traumatic amputation and tendon injury had satisfactory outcome. Sixty five percent of the fractures had united (especially the closed fractures) while others were at various stages of healing (mostly the open fractures).

Eight patients died (3.6%). Those who died had associated head injury (62.5%), hypovolaemic shock (25.0%), combination of chest injury and hypovolaemic shock (12.5%). Mean Glasgow Coma Score (GCS) of those who died from associated head injury was 5; Mean ISS in those who died was 20.9.

DISCUSSION

The involvement of more males than females in this study correlates with finding by other authors^{2,6,7,8}. Males are by their nature more active and likely to be involved in more risky activities than females^{6,7,8}.

Majority of the patients with limb injuries in this study (62.3%) were in the age range of 20 – 39years. This is comparable to findings in other studies^{6,9,10}. This is the active and productive age, and the greatest natural resource of any nation. There are therefore serious socio-economic consequences to the family and the nation. The family spends money on treatment and the nation loses man-hours⁵.

Road traffic accident was the leading cause of limb injuries

accounting for 83.4% of cases. It has been noted in previous studies that “road traffic injuries are a major cause of misery, disability and death globally, with a disproportionate number occurring in developing countries”^{4,11}. This high incidence of RTA is consistent with findings in other African communities^{4,12,13}. This is due to a combination of factors including increase in number of vehicles, which are mostly fairly-used imported vehicles from Europe and Americas and often poorly maintained on arrival in Africa, non-use of safety devices such as crash helmets and seatbelts, use of alcohol by motorists, bad roads and inadequate enforcement of road safety regulations by government agencies. The high contribution of motorcycles to RTA (62.9%) in our study is especially noteworthy. Donation of motorcycles to their supporters by politicians has increased the contribution of RTA to causation of limb injuries. The increasing use of motorcycles for commercial transportation in Nigerian cities including Calabar coupled with little or no formal training of the riders on how to operate the motorcycles are also contributory factors¹⁴. Overloading of the motorcycles and disregard for traffic regulations are common occurrences. Of note is the finding that most (65%) of those who sustain limb injuries in these motorcycle crashes are the riders of the motorcycles themselves. This contrasts with the result of another study in which most of the victims of motorcycle crashes were childhood pedestrians¹³.

Gunshot caused limb injuries in only 3.1% in this study, which is consistent with findings during peacetime⁹, and period of less political activities.

The occurrence of fracture as the commonest injury sustained in this study is an indication of the severity of the limb injuries. Fracture of the tibia/fibula (combined) and femur were the most common, accounting for 38.5% and 22.5% respectively of the fractures in this study. This is consistent with the preponderant affectation of the lower limbs in this and another study done elsewhere¹⁵. Fracture of the humerus accounted for 14.2% of all fractures in this study. The high incidence (53.3%) of open fractures in this study is noteworthy. This may be due to significant involvement of motorcyclists in the causation of these injuries as well as the high affectation of the tibia that is largely subcutaneous. Forty-eight patients (21.5%) sustained multiple limb injuries.

That most of the limb injuries including fractures were treated by non-operative methods, even with availability of facilities and skilled manpower for operative treatment in

our centre, underscores the aversion of our people to operative treatment of injuries especially fractures. This is possibly due to ignorance of the benefits obtainable from such treatment, and faith in unorthodox health providers like the traditional bonesetters. Most of the patients with fractures who signed against medical treatment indicated their intention to go to the traditional bonesetters for treatment. The relatively high cost of operative fracture treatment in the face of dwindling financial capability of our patients may also be an important contributory factor.

Limb injuries often occur in association with injuries to other parts of the body like the head, spine, chest, abdomen and the genito-urinary organs. In this study, associated injuries occurred in 20% of patients. Head injury was the commonest associated injury accounting for 71.1%. This occurred in five of the eight mortalities (62.5%) recorded in this study while hypovolemic shock occurred in two (25%); and a combination of chest injury and hypovolaemic shock occurred in one (12.5%). The Glasgow Coma Score (GCS) of the mortalities with associated head injuries ranged from 3/15 to 8/15, which is indicative of severe brain injury. The Injury Severity Score (ISS) correlated directly with the mortality in this study as those who died had the highest ISS.

CONCLUSION

Limb injuries are common in our society. The typically involved is a young adult male (average age 30years) involved in a road traffic accident, commonly as a rider of a motorcycle sustaining open fracture of the tibia and fibula, who usually had no protective helmet.

Reduction in the incidence of road traffic accidents in our society would result in a decrease in the number of limb injuries. This should include provision of good road network and maintenance of existing ones. Road safety measures should involve public enlightenment, appropriate legislation, and enforcement of traffic regulations such as compulsory use of protective helmets by motorcyclists and their passengers, and compulsory use of seatbelts by motor vehicle occupants. Stiff penalties for offenders should also be enforced.

The increasing use of motorcycles for commercial transportation in our urban centres should be actively discouraged and the government should develop effective mass transportation system in the country.

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