Brief communication

Adult limb fractures in Tikur Anbessa Hospital caused by road traffic injuries: Half year plain radiographic pattern

Daniel Admassie[1], Tekle Yirga[1], Biruk L. Wamisho[2]

Abstract

Musculoskeletal road traffic injuries (RTIs) are alarmingly increasing encounters in trauma centers of developing countries and they are public health emergency. Knowledge of commonly presenting radiological pattern helps in planning and getting prepared for managing these injuries. This prospective study done at Addis Ababa University, Medical Faculty, "Tikur Anbessa" Hospital (TAH) was aimed at detailing the radiology of musculoskeletal RTIs in a half- year period from March to August 2007, in Addis Ababa. A total of 202 patients with musculoskeletal road traffic injuries were included in the study. Of the total 422 adult patients who presented to the emergency department of TAH and had musculoskeletal injuries, in nearly half, 49.7% (202 patients) the cause of injury was road traffic accident (RTA). The highest frequency of fractures occurred in the femur 32(15.8%) followed by tibio-fibular 29(14.4%) and humerus 26(12.9%). Incomplete fractures comparatively accounted smaller proportions, 23(11.4%). Transverse fractures stand out the first 125(61.9. %) followed by oblique 38 (18.8%) and comminuted 29 (14.4%) fractures. Road traffic injuries (RTI) were responsible for almost half of the musculoskeletal injuries. Machine injuries and fall injuries were second and third respectively. Most of the fractures were simple transverse and may be manageable on a day case basis. RTI needs special attention, prevention, intervention and planning of management. [*Ethiop. J. Health Dev.* 2010;24(1):61-63]

Introduction

Road traffic injuries (RTIs) are a major health problem worldwide. It is estimated that 3,000 people die and 30,000 are seriously injured in the world's roads every day with the majority of the casualties coming from what the world bank classifies as low and middle income countries (1). While for a long time road traffic injuries have been the leading cause of permanent disability and mortality among those aged 10 to 50 year in developed countries, the same picture is unfolding in developing countries as they undergo what has been termed the "epidemiology of transition" (2). In many developing countries, not only is the incidence of various injuries increasing but also the causative factors are changing from the historical patterns such as falling from trees to injuries due to occupational hazards, interpersonal violence and road traffic injuries, which appear to be the leading cause of traumatic injuries (3).

Statistics from many developing countries ascertain to these changes. In Mexico for example, as deaths from infectious diseases declined from 43% to 17%, from injuries it rose from 4% to 11% of all deaths, with road traffic injuries contributing to most of the deaths (4). The situation in Africa shows a similar trend. Nigeria with one of the highest road traffic injury rates, recorded an increase of 43% in road traffic injuries with 110% increase in death rates, between 1977 and 1983 (5). The corresponding populations increase during the same period was only 2.7%. Another study in Nigeria found that the proportion of death from road traffic injuries increased from 38.2% to 60.2% within ten years (6). Similar trends have been reported from East Africa. Road traffic related fatalities in Kenya increased by 578% and non fatal casualties by 506% between 1962 and 1992 (7). Tanzania road traffic accidents accounted for 56% of all patients admitted to Muhimbili Medical Centre due to injuries (8).

Despite the increasing trend suggested by available data, injuries in general and road traffic injuries in particular have not received the attention they deserve in most developing countries. Lack of empirical data and poor quality of the data that exist is probably part of the problem (9). At the same time this is partly due to the still significant incidence of infectious disease in many countries. Availability of empirical data would not only have revealed the magnitude of the problem but would also have helped in identifying the risk factors and target groups so that a scientific approach to prevention can be planned. The objective of the study is to show the magnitude of the problem and to see pattern of bone fracture in plain radiography of adult caused by road traffic injury in our setup.

Methods

This study was a cross-sectional, institution based prospective study. The study included all the injury patients who attended the Emergency department of "Tikur Anbessa" Hospital (TAH) from March to August

[1]Department of Radiology, Addis Ababa University, Faculty of Medicine, Addis Ababa, Ethiopia, E-mail: dadmasie@gmail.com, tekleyir@yahoo.com

[2]Department of Orthopedic Surgery, Addis Ababa University, Medical Faculty, E-mail: lbiruklw@yahoo.com, Addis Ababa, Ethiopia.

2007. A single population proportion formula was used to estimate the sample size and the following assumptions was made: proportion of patients with injuries as level of significance to be 5% and absolute precision or margin of error to be 5%. Considering a 10% non-response rate would finally made the sample size 422. Out of this large trauma series of the 422 victims, which was published (10), 202 adults with RTI were separately looked at to give due emphasis to the problem.

When a patient was first seen in the emergency department, an entry was made on an 'attendance list' preformed by duty residents who managed the patient. This list was available for the early morning department staff meeting when the details of the patients who attended during the previous twenty-four hour were presented and discussed. It contained the usual socio-demographic details together with the diagnosis as well as very limited details of how 'the injury' or 'problem' was caused. In addition a registration book was completed in the emergency department by the nurses, and contained records with practically uniform information. This allowed useful double verification of the data. Data collection related to radiological variables was done by the research team. All radiographs were read by radiologist. Pediatric patients (age<15) are excluded from the study. Those patients with insufficient data with regard to important variables and data related to research question and objective were excluded. The clinical notes and the radiological findings were first recorded on the data sheet format. The data were entered; cleaned and analyzed using Epi Info-2002 version and MS-Excel 2007.

Results

A total of 422 patients who attended the surgical and orthopedic outpatient emergency department of "Tikur Anbessa", a University Hospital with x-ray proven bone fracture were studied over six month's period from March to August, 2007. Several causes responsible as to the etiology of trauma were identified. Road traffic injury constitutes the largest proportion, 202 (47.9%) of injured patients. Most of the study subjects involved in RTA were males, 151 (74.8%). Among these 202 patients with RTA, the highest age group mostly affected was between 15-25years (35.1%) (Table 1).

With regard to the occupation; daily laborers accounted for forty-seven (23.3%), house wives twenty nine (14.4%) and, twenty seven (13.4%) were students. These three accounted for 51.1% of the RTA. The proportion of daily laborers, house wives and students constitute the first three ranks respectively. Car drivers accounted for 10% (20) and 18 (8.9%) of the victims were Merchants. Eighteen (8.9%) farmers were injured and there was one policeman injured.

Table 1: **Age distribution of patients presented to Tikur Anbessa Hospital with RTI from March-August, 2997.**

Age range (Yrs)	Frequency	Percent
15-25	71	35.1
26-36	60	29.7
37-47	33	16.3
48-58	19	9.4
59-69	13	6.4
>69	6	2.9
Total	**202**	**100**

Injuries to the upper limb alone accounted for 41.1% whereas the proportion of injury for the lower limbs was 57.4% and both upper and lower extremities were involved in 1.5%.Polytrauma accounted for 10 (5%) of the victims. The highest frequency of fractures occurred in the femur 32 (15.8%) followed by tibio-fibular 29 (14.4%) and humerus 26 (12.9%). Isolated pateelar fracture occurred in 22 (10%), Ankle fractures accounted for 9 (4.5%) patients; Pelvic fracture was seen in 6 (3%) patients. There were 5 combined femur and tibifibular fractures. Each of Floating knee and floating elbow were seen in one patient. Table 2 shows the nature of fractures sustained. The majority of fractures were closed fractures, accounting 166 (82.2%). Open fractures were smaller in number and proportions only responsible for 36 (17.8%). The pattern of the majority of the fractures that occurred was complete fracture 179 (88.6). Incomplete fractures comparatively accounted smaller proportions 23 (11.4%). With respect to the pattern of fractures, transverse fractures stand out the first 125 (61.9. %) followed by oblique 38 (18.8%) and comminuted 29 respectively (Table 3). Finally side of fractures were analyzed and the left side was slightly more involved accounting 101 (50%) as compared to the right side 100 (49.5%) and 1 (0.5) had involvement of both sides.

Table 2: **Nature and type of fracture seen in Patients presented to Tikure Anbessa Hospital with RTI from March-August, 2008.**

	Frequency	Percent
Closed	166	82.2
Open	36	17.8
Total	202	100.0
Complete	179	88.6
Incomplete	23	11.4
Total	**202**	**100.0**

Table 3: **Specific Pattern of Fracture seen in Patients Presented to Tikur Anbessa Hospital with RTI, from March-August, 2007.**

	Frequency	Percent
Transverse	125	61.9
Oblique	38	18.8
Comminuted	29	14.4
Spiral	5	2.5
Impacted	5	2.5
Total	**202**	**100.0**

Discussion

This study revealed that out of the 422 study participants, road traffic injury (RTI) accounted for the majority of the injuries, which is 202 (47.9%). The comprehensive trauma studies were published from same Hospital separately (10, 11). Study done by Andrews et al in Kampala 1997 revealed that the road traffic accident accounted for 35.1 % of all the trauma cases (12). Similar study done at Nigeria teaching hospital showed that among 349 patients with injury 137 patients sustained RTI which accounted 38.8% of all injuries (13). A study done by Taye and Munie in 'Tikur Anbessa' Hospital also showed among the 3822 injured patients in the study 40% were RTI (11). All these results were compared with our results and showed significant difference RTI being higher in our study. This percentage increased to nearly 48% which may show an increasing RTIs presenting to the Hospital. This may be due to genuine increase in the occurrence of RTIs or due to increased patients getting referred to TAH. This needs a nation wide study.

The dominance of simple transverse pattern fractures (>60%) calls for setting a day care surgery for operatively fixing the fractures. This helps to increase the turn over of patients occupying beds- a major problem in developing countries. Findings in this study also call for a need to collaborate with the public, drivers, the police, policy makers and health service providers for interventions in prevention and effectively treating RTIs. However, there is need to collect supporting national data and information on road traffic injuries in order to develop specific intervention at different levels.

Based on the study the following are our recommendations:

The major cause of traumatic fractures in adult long bones is RTI and this needs special attention to decrease the incidence. Most of the fractures were simple transverse and may be manageable surgically on a day case basis for example using SIGN interlocking nails.

Acknowledgments

We thank the patients for co-operating in the study. We thank the departments of Radiology and Orthopedics in the Medical faculty. Special thanks to Dr Belete Zergaw and Dr. Mohamed Abseno (MD, MPH) for their great help and advice in the statistical analysis and discussion of results.

References

1. Murray CJL, Lopez AD. Global health statistics: A compendium of incidence, prevalence and mortality estimates for over 200 conditions. Cambridge (MA): Harvard University Press; 1996.
2. Omran AR. Epidemiological transition in the United States, the health sector in population change. Popul Bull 1977;32:1-42.
3. Nordberg E. injuries in Africa: A review. East Afr Med J 1994;7(6):339-45.
4. Frenk J, Bobadilla JL, Sepuwede J. Health transition in middle-income countries: New challenges of health care. Health Po1icy Planning 1989;4:29-39.
5. Ezenew AO. Trends and characteristics of road traffic accidents, in Nigeria. J Roy Soc Hlth 1986;106:27.
6. Asogwa SE. Road traffic accidents: A major public health problem in Nigeria. Public Health 1978 Sep; 92(5):237-245.
7. Odero WO, Kibosia JC. Road traffic accident in Kenya: An Epidemiological Appraisal. East Afr Med J 1995; 72(5):299-305.
8. Museru LM, Leshabari MT, Grobu U, Lisokotala LNM. The pattern of injuries seen in the orthopedic/trauma wards of Muhimbili Medical Centre. East Central Afr. J Surg 1998;4(1):15-22.
9. Museru LM. Injuries in Africa and the need to develop preventive strategies. East Central Afri J Surg 1999;5(1):51-55.
10. Admasie D, Yirga T, Wamisho B. Radiological and clinical details of major adult limb fractures in a teaching hospital, AAU, Ethiopia. East and Central African Journal of Surgery 2009;14(1):88-97.
11. Taye M, Munie T. Trauma registry in Tikur Anbesa Hospital, Addis Ababa, Ethiopia. Ethiop med J 2003;41:221-226.
12. Andrews CN, Kobusingye OC, Lett R. Road traffic accident injuries in Kampala. East Afr Med J 1999;76(4):189-193.
13. Nordberg E. Injuries in Africa: A review. East Afr Med J 1994;71(6):339-45.