

Road Traffic Injuries at Kigali University Central Teaching Hospital, Rwanda.

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Background: Injury and deaths due to road traffic crashes are a major public health problem in developing countries. More than 3000 people die on the world's roads every day. Tens of millions of people are injured or disabled every year. Children, pedestrians, cyclists and the elderly are among the most vulnerable of road users. More than 85% of all deaths and 90% of disability adjusted life years lost from road traffic injuries occur in developing countries. Road traffic injuries in developing countries particularly affect the productive (working) age group (15-44 years) and children. Among children aged 0-4 and 5-14 years, the number of fatalities per 100 000 population in low income countries was about six times greater than in high income countries in 1998. Police data for Rwanda has revealed a decline in the number of road traffic accidents. This reduction in number of RTA has been attributed to the vigilance of Traffic Police, This study was aimed at determining the pattern of road traffic injuries seen at Kigali.

Methods: This was a retrospective descriptive study done at Kigali Central University Teaching Hospital in the Department of Emergence and in the Trauma hospitalization wards. Records of all cases of road traffic injuries were retrieved and studied. Data collected was filled in a standard form in which data obtained was recorded. Parameters studied included the age, sex, place of residence, province of origin, means of transport used.

Results: Of the 1101 road traffic accident victims, 558 (50.7%) were in the 16 to 30 age group. Only 7.2% of the cases were aged 46 years and above with only 21 (1.9%) being above 60 years. Table 3 shows the socio-demographic findings among patients with road traffic injuries seen at Kigali University Teaching Hospital (CHUK). There was a predominance of males accounting for 78.7% with a male to female ratio of 3.7: 1. Most patients (90.2% were residents of Kigali city. Most patients came to CHUK without going through the established referral systems (Table 4). The commonest injuries were wound and contusions (54.7%), lower limb injuries (41.9%) and head injury (29.4%). There were 103 deaths (9.4% mortality rate). Fifty eight (56.3%) of the deaths occurred before arrival to hospital

Introduction

Road traffic injuries (RTI) constitute a major but neglected public health problem and they have a significant adverse effect on the economy and health services of many countries. The WHO found that 1.2 million people are killed each year and about 50 million are injured over the world¹. Statistics available in come from Rwanda Police registers and give only the number of injured people but do not say anything about diagnosis and importance of the trauma². Before the invention of vehicles, injuries on the road were rare and involved animals, pedestrians and trolleys among others. With the invention of vehicles (cars, buses, motorcycles, etc) road traffic injuries increased. According to available information, the first accident involving a bicycle was registered in New York on 30 may 1896. The first death of a pedestrian

Knocked by a vehicle was on 17 August 1896. By 1997, 25 million people had been killed in road traffic accidents (RTA). In 2002, 1.18 million died of RTI, giving an average of 3242 deaths per day. Road traffic injuries accounted for 2.1% of all deaths and were the 11th cause of deaths worldwide. Among deaths registered in 2002, 90% were in developing countries¹.

Apart from causing deaths, RTA account for injuries in 20-50 Million people annually. Since 60^s – 70^s the mortality rate in developed countries has declined. For example, in 1975-1998 in the North America, deaths due to RTA decreased by 27% for a population of 100.000 inhabitants in USA, and in Canada the decrease were 63%. However, in the developing countries, the rates have been on the increased^{11,8,9} for instance by 243% in China and by 44% in Malaysia¹⁰.

Police data for Rwanda has revealed a decline in the number of road traffic accidents. This reduction in number of RTA has been attributed to the vigilance of Traffic Police (Table 1). Table 2 shows the causes of road traffic accidents as reported by the Police². The number of victims of road traffic accidents decreased by 650 (16%) in 2005 compared to 2004 and by 800 (19%) in 2004 compared to 2003. According to the police, carelessness was the leading cause of RTA in Rwanda followed by over speeding and wrong manoeuvres. This study was aimed at analyzing the cases of RTI treated at CHUK in Rwanda.

Patients and Methods

This was a retrospective descriptive study done at CHUK in the Department of Emergence and in the Trauma hospitalization wards. It covered all the RTI victims who consulted Emergence department from 1st Jan. to 31st Dec.2005. The data was collected from the patients' registers of emergence department, admission, files of emergence department and hospitalization files in surgery and intensive care unit.

Data collected was filled in a standard form in which data obtained was recorded. Parameters studied included the age, sex, place of residence, province of origin, means of transport used at the time of accident, loss of consciousness (LOC) on arrival; type of lesion, findings on clinic examination, treatment received, place of hospitalization, evolution and duration of hospitalization, were included.

Results

Of the 1101 road traffic accident victims, 558 (50.7%) were in the 16 to 30 age group. Only 7.2% of the cases were aged 46 years and above with only 21 (1.9%) being above 60 years. Table 3 shows the socio-demographic findings among patients with road traffic injuries seen at Kigali University Teaching Hospital (CHUK). There was a predominance of males accounting for 78.7% with a male to female ratio of 3.7: 1. Most patients (90.2%) were residents of Kigali city. Most patients came to CHUK without going through the established referral systems (Table 4). Only about a third (32.2%) of the patients were hospitalized. Among hospitalized patients, 50.3% spent between 8 -30 days.

Table 1. Rwanda Police Statistics of 2002 – 2005 Road Traffic Accident

	2002	2003	2004	2005
Accidents	3930	4210	4063	3410
Severe	1221	963	955	735
Not severe	2709	3247	3008	2675
Day	3045	3191	2995	2517
Night	885	1019	1078	893
Injured	3227	3392	3206	2856
Dead	416	385	323	267
Total	15433	16407	15628	13353

Table 2. Causes of RTA in Rwanda According to 2002 – 2005 Police data.

Cause	2002	2003	2004	2005
Overspeeding	780	749	560	447
Drunkardness	238	114	114	81
Carelessness	1920	2458	2398	1894
Wrong manoeuvres	432	408	595	648
Mechanical problems	300	202	154	136
Poor roads	56	53	49	34
Rains (slippery roads)	30	11	9	5
Lack of sign posts	12	8	2	3
Other	162	207	182	162

Total	3930	4210	4063	3410
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Table 3. Socio –Demographic Characteristics

Characteristics (N = 1101)	Frequency	%
Age		
0 – 15years	226	20.5
16 – 30	558	50.7
31 – 45	238	21.6
46 – 60	58	5.3
60	21	1.9
Sex		
Male	866	78.7
Female	235	21.3
Residence		
Kigali City	993	90.2
Other Provinces	108	9.8

Table 4; Distribution According to the Place of Origin

Origin (N= 1101)	Frequency	%
Referral hospital (KFH)	4	0.3
District Hospital	57	5.2
Health Center	13	1.2
Police	33	3
Direct Admission	982	89.2
Not specific	12	1.1

Table 5. Type of Transport Causing the accident

Type of transport	Frequency	%
Bicycle	54	10.3
Motocycle / motobike	159	30.5
Motor car	212	40.7
Minibus	79	15.2
Bus	14	2.7
Lorry	3	0.6
Total	521	100

Table 6. Distribution According to the Type of Lesions Sustained

Type of Lesion	Frequency	%
Wounds and contusions	602	54.7
Monotrauma (N= 666)	666	60.5
Head	196	29.4
Upper limbs	96	14.4
Lower limbs	279	41.9
Abdomen	60	9
Thorax	9	1.3
Vertebral Column	7	1
Pelvis	19	2.8
Polytrauma (N = 38)	38	3.4
Abdomen + Limbs	4	10.5
Abdomen + Thorax	3	7.8
Head + Thorax	3	7.8
Head + Abdomen	13	34.2
Head + Limbs	11	28.9
Head + Vertebral Column	1	2.6
2 lesions	3	7.8

Regarding the time of the accident, 733 (66.6%) occurred during the day, 215 (19.5%) at night and in 153 (13.5), the time was not specified. The type of transport involved in the accident was not specified in 579 (52.6%) case and was known in 521. In 16.7%, the victims were pedestrians. Motorcycles and motor cars accounted for 30.5% and 40.7% among those whose form of transport was known (Table 5). Only

Discussion

Our study confirmed that young adults in their prime of life are most commonly sustain road traffic injuries. The average in our study was 25.7 years with a peak in the 16 – 30 years group. In their studies on road traffic accidents, Bikandou³ in Brazzaville in Congo and Hoekman et al⁴ in Niger found an average age 24.8 years and 26.3 years respectively. Romao et al⁵ in Mozambique in a study on RTA, found the 25 – 38 years age group to be most commonly affected. Odero et al⁶ in Kenya found a peak in the 15 – 44 age group.

The male to female sex ratio in this review was 4 : 1. The preponderance of males has been reported from elsewhere. The male to female sex has ranged from 2:1 in Brazzaville³ to 5: 1 in Mozambique⁵. Sheng Yong⁷ in china recorded a male to female sex ratio of 4: 1. In our study, the male to female sex ratio was 4: 1. The reason male predominance is probably because males are more mobile with active participation in transport activities. The finding that 66.6% of road traffic injuries were sustained during the day was in agreement with the Rwanda National Police statistics². Similar findings were reported by Andrews, Kobusingye and Lett⁸ in Uganda.

Only 32.2% of our patients were hospitalized with an average hospital stay of 7 days. In their study, Odero et al⁶ in Kenya reported a hospitalization rate of 31% which is much higher than the 5.6% reported by Bikandou et al³ in Brazzaville. Rossi et al⁹ in Italy. Wounds and contusions were found in 54.7% of our cases which was

about a third (32.2%) of the patients were hospitalized.. Among hospitalized patients, 50.3% spent between 8 -30 days. The commonest injuries were wound and contusions (54.7%), lower limb injuries (41.9%) and head injury (29.4%).

There were 103 deaths giving a 9.4% mortality rate. Fifty eight (56.3%) of the deaths occurred before arrival to hospital. comparable with the 50.98% reported in Brazzaville Congo and the 50% recorded in Italy^{3,9}. Head injury as a single entity was recorded in 29.45 of cases which was higher than that reported in Congo (9.82%) and in Mozambique (11.8%)^{3,5}. Limbs are commonly traumatized in road traffic accidents and were involved in 56.3% of our patients with a predominance of lower limbs trauma (41.9%). This figure is high compared to the others. Limb trauma was reported in 42.3% of children involved in RTA in Gabon¹⁰ and in 48% of children in Ivory Coast¹¹. In Brazzaville limb trauma was observed in only 18.05% of cases³.

Our high figure of limb trauma is attributable to the large number of pedestrians in Kigali city, which include children. It ought to be stressed that with Rwanda being hilly, the mechanical state of vehicles should be perfect with a reliable braking system.

Splenic rupture was sustained in 40% of the 9% cases that had abdominal injury. Pelvic fractures were seen in 2.8% of our cases. Raouf et al¹⁰ in Gabon had 16.4% frequency of abdominal injury, higher than the 8.5% reported in Brazzaville³. The high frequency of splenic rupture is most likely attributable to splenomegaly secondary to endemic malaria.

Thoracic Trauma occurred in 1.3% which is lower than that of 3.46% reported by Bikandou et al³ and 11.2% by Raouf et al¹⁰. This lower incidence in Rwanda may be due to strictness of Rwanda Traffic Police to use of safety belts². Only 1% of our cases sustained spinal injury.

A large number (18.6%) of the patients in CHUK stayed in hospital for over 30 days. The overwhelming numbers of patients with few surgeons makes patients wait for a long time before operation, except emergencies. Our results show that 91.6% of our RTA cases made a good progress. The overall mortality was 9.4%. Most deaths occurred at the site of accident, on the way to the hospital or soon after admission to the emergency unit. The overall death rate in our series was lower than that reported by Hoekman et al⁴ of 15.6% and 15.1% by Rossi et al⁹.

In our study history of loss of consciousness (GCS 9) in motorcycle accidents was recorded in 55% which was comparable with the 51.2% reported by Hoekman et al⁴.

Patients with Glasgow coma scale of below 9 had 82.9% mortality rate. Hoekman et al⁴ recorded 46.9% mortality among their cases scoring GCS of less than 9. Although patients aged 60 years and above accounted for only 1.9%, in our study, they contributed 23.8% of the deaths. This increased mortality among the elderly was also found by Rossi et al⁹ but those who were over 70 years of age..

Conclusion:

- The youth (16-30 years) in the most productive (active) age were most commonly involved in RTA. And accounted for 50.7% of the cases.
- Males were predominantly affected (78.7%).
- Motorcycles and cars were the major causes of accidents on the roads.
- The majority (56.3%) of the deaths occurred before arrival to hospital.
- Prognosis depends largely on LOC on arrival.
- RTI were associated with long hospital stay beds (16-30 days) and over.

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