

Injury Patterns and Treatment Outcome of Road Traffic Crash Victims at the Emergency Department of the Regional Hospital Limbe, Cameroon

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Abstract

Background: Traumatic injuries constitute a leading cause of mortality and morbidity worldwide with a global burden that is on the rise. The aim of this study is to analyse preliminary data of the Limbe trauma registry, to describe the injury patterns and determine the outcome of care of the injured who were treated in the emergency department of the regional hospital Limbe in Cameroon. **Methodology:** This was a descriptive secondary analysis of prospective data collected on injury at Limbe Regional Hospital in two years, between October 2008 and October 2010. All cases of injury presenting to the emergency department of Limbe Regional Hospital were included in a prospective trauma registry. Data was collected with a pre-tested data entry form and included the age, sex, mechanism of injury, delay before arrival to hospital, body part injured, description of lesions and outcome at the emergency. Descriptive analyses were done using STATA 14. Comparisons between groups were evaluated using Chi-squared test or Kruskal-Wallis and p-values <0.05 were considered statistically significant. **Results:** A total of 2400 cases of injury were recorded during the study period with more males (68%) than females. The ages ranged from 0 to 90 years with a peak between 20 to 39 years. Road traffic crash was the most common cause of injury representing 60.81% of the population (n = 1434); other causes were burns, falls, domestic injuries, assaults, and labour accidents. The accidents mostly involved motor cycle alone

(42.03%). Concerning the outcome of care at the emergency department, 88.73% (n = 1260) were discharged. **Conclusion:** The burden of road traffic injuries in south west Cameroon is high. Motorcycles are mostly involved alone or with pedestrians and/or cars.

Keywords

Traumatic Injuries, Limbe Regional Hospital, Cameroon

1. Introduction

Traumatic injuries constitute a leading cause of mortality and morbidity worldwide with a global burden that is on the rise. It is estimated that by 2030, traumatic injuries especially due to road traffic crashes will be the third leading cause of global burden of disease ahead of ischemic heart disease [1]. This burden disproportionately affects low- and middle-income countries especially in Africa. About 5.8 million people die each year due to trauma, accounting for 10 % of the world's deaths, 32% more than the number of fatalities that result from malaria, tuberculosis and HIV/AIDS combined [2]. However, it is known that nearly one third of the 5.8 million deaths from injuries are the result of violence and nearly one quarter are the result of road traffic crashes [1] [2]. Road traffic injuries affect all age groups but have a particular impact on young people and constitute the leading cause of death under the age of 45; this age group represents a significant part of the working population thereby accounting for more productive years of work lost than other illness, with an enormous economic and societal impact [3].

In 2004 it was estimated that Cameroon has an annual mortality rate due to injury of 101.8 per 100,000 populations which ranks among the highest in sub Saharan Africa [4]. A pilot study done in Cameroon showed that injuries constitute a significant proportion of emergency visits and utilization of surgical services [5]. It is inferred that a good number of the Cameroonian population don't go to larger trauma centers because of their lower socio economic status compared to the richer population suggesting the possibility of barriers to accessing care and consequently an underestimation of the actual burden of traumatic injuries [6]. More so, poorer patients are more likely to have severe injuries and more likely to need surgery, but are less likely to seek care from major trauma centers immediately [6] [7]. All these contribute to limit hospital based data as an effective tool for injury surveillance.

In Cameroon, road traffic injury surveillance systems which could provide data source with the best collection of road traffic injury events are unclear [7]. However, Data from hospital trauma registries, police records, and newspapers have been recently exploited to yield a clue on the impact of road traffic injuries [5] [8] [9]. Community based surveys which ideally provide a comprehensive, population-based estimation of injury incidence and mortality, however require more

time, financial and human resources to be carried out successfully and somewhat difficult in a resource-limited country like ours. A previous study using hospital records as a primary source of injury data in the Limbe Regional Hospital before the institution of a formal trauma registry highlighted the fact that injuries are an important problem that is grossly underestimated in Cameroon [10]. In 2008 the Limbe trauma registry was therefore instituted to improve injury surveillance, as per WHO recommendation of the Essential Trauma Care project, designed for implementation in low income countries [11] [12] [13] [14]. We therefore aimed at analyzing preliminary data of the Limbe trauma registry to describe the injury patterns and determine the outcome of care of the injured who were treated in the emergency department of the regional hospital Limbe.

2. Patients and Methods

This study is a secondary analysis of prospective data collected on injury at Limbe Regional Hospital between October 2008 and October 2010. Limbe Regional Hospital is a regional referral center with a mixed urban/rural catchment population in Southwest Cameroon. At least one doctor is on duty at all times and consultant surgeons are called upon to direct management and carryout emergency surgeries if required.

Between October 2008 and October 2010 all cases of injury presenting to the emergency department of Limbe Regional Hospital were included in a prospective trauma registry. Data was collected with a pre-tested data entry form and included the age, sex, mechanism of injury, delay before arrival to hospital, body part injured, description of lesions and outcome at the emergency. The data was then transferred from paper form to EXCEL and stored securely.

Descriptive analyses were done using STATA 14. Comparisons between groups were evaluated using Chi-squared test or Kruskal-Wallis and p-values < 0.05 were considered statistically significant.

3. Results

A total of 2400 cases of injury were recorded during the study period with more males (68%) than females. The ages ranged from 0 to 90 years with a peak between 20 to 39 years (**Figure 1**).

Road traffic crash was the most common cause of injury representing 60.81% of the population (n = 1434); other causes were burns, falls, domestic injuries, assaults, and labor accidents (**Figure 2**). Over 60% of the crash victims were males (n = 1003).

A majority of the victims 79.24% (n = 954) arrived the emergency department within one hour after the accident, 17.86% arrived within 6 hours while the rest 2.90% arrived after 6 hours following the injury.

The accidents mostly involved motor cycle alone (42.03%) as seen in **Figure 3**. The lesions observed were varied as shown in **Table 1**.

The most commonly affected body regions were the upper and lower extremities,

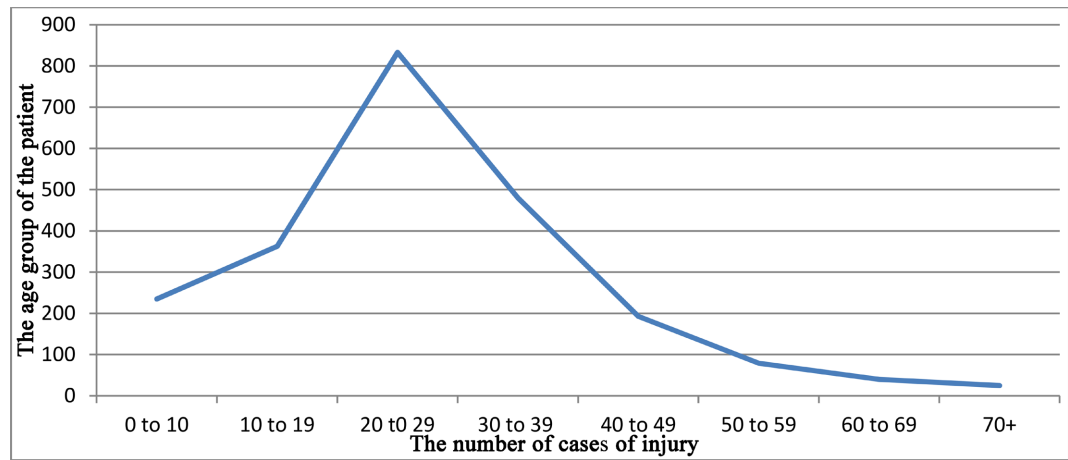


Figure 1. Age distribution of the study population.

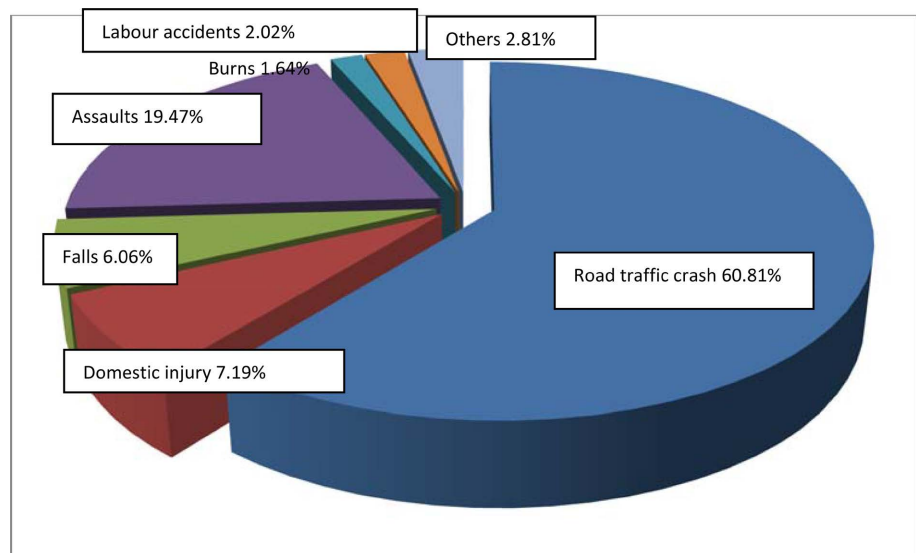


Figure 2. Distribution with respect to the cause of injury.

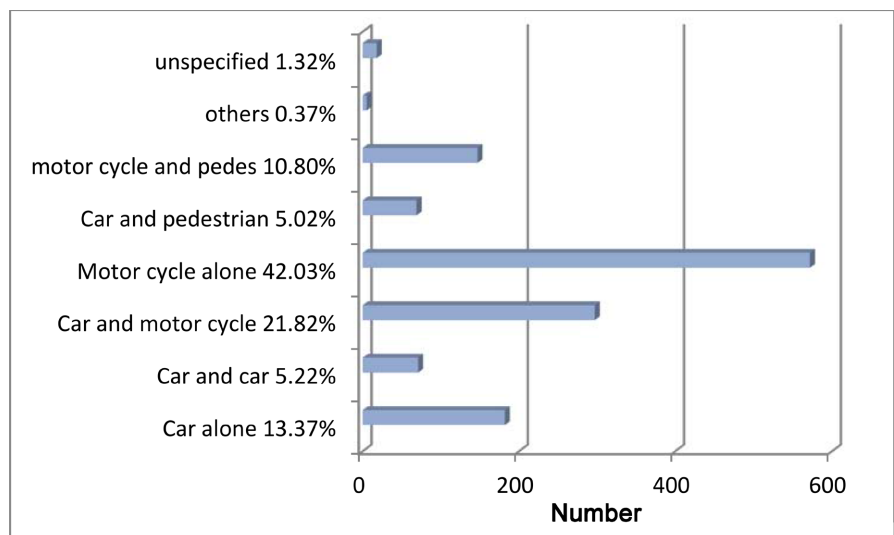
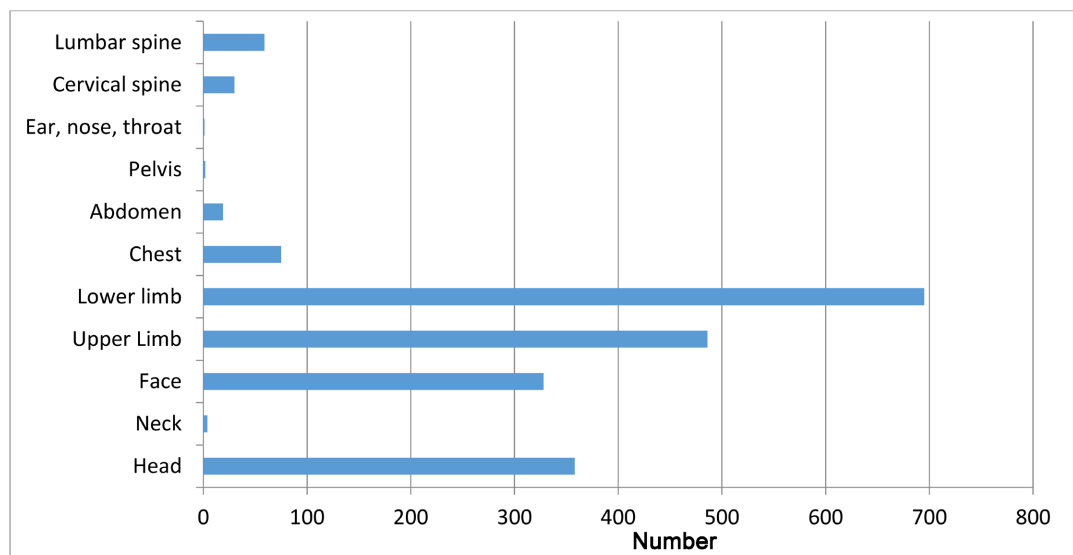


Figure 3. Distribution of road traffic crashes according to type of collision.

Table 1. Types of lesions.

Lesions	Frequency
Wound	591
Burns	22
Pain	331
Bruises	696
Fractures	89
Bleeding	18
Hematoma	11
Dislocation	3
Swelling	11
Others	3

**Figure 4.** Body part injured.

the head and the face as shown in **Figure 4**.

Concerning the outcome of care at the emergency department, 88.73% (n = 1260) were discharged, 6.62% (n = 94) were admitted, 3.87% (n = 55) were referred to other hospitals while 0.56% (n = 8) were either dead on arrival or died at the emergency.

4. Discussions

Though registry reports may underestimate the prevalence and actual burden of road traffic injuries [15] [16], our analyses of the Limbe trauma registry give a clue about the burden, pattern of injury, injury characteristics and outcome of care of road traffic crash victims.

In all, the study found out 2400 injuries between October 2008 and December

2010. A community based study in Tanzania found out that 4.3% of all emergency visits were due to trauma, while other studies in some sub-Saharan countries found values which were over 50% [17] [18] [19] [20]. A prior study in the south west region of Cameroon before instituting a formal trauma registry noticed that injury-related conditions represented 27% of all registered admissions in the casualty department [10].

Our study indicates that road traffic crash is the major cause of injury among victims who come to the emergency department of the Limbe regional hospital, accounting for over 60% of all injured. This was closely followed by assaults (33.9 %) and domestic injuries (7.19%). This finding is dissimilar to findings in Ethiopia [18], and Jimma University Specialized hospital in which assault contributed to more injury cases followed by road traffic injuries [21]. However, other Cameroon based studies found RTI as the highest cause of injury [5] [6] [10].

This study found that, the male sex was predominantly affected and there was a significant association with injury ($p < 0.05$), consistent with other studies which also found male predominance [18] [21]. Age was found to be associated with injury ($p < 0.05$) with the age range from 20 to 49 years being the most affected. An Ethiopian based study found age to be associated with injury and the odds of injury were 2.3 times more likely in participants aged between 20 - 44 years [18]. Other authors also report similar finding [21] [22] [23].

Our study also revealed that the highest rates of casualties are among motorized two-wheeler occupants and pedestrians, most of which involved motor cycles alone in 40% of cases. In a similar survey in rural south west region Cameroon, over 70% of the censored used motorcycles always or often [24]. Most of the motor cycle riders haven't undergone any formal training for driving a motorcycle, a vast majority in our context ride for business purposes. Contrary to our findings, other studies revealed highest rates of casualties among motorized four-wheeler occupants and pedestrians [25]. In 2013, WHO reported that 43% and 38% of road traffic deaths in the African Region occurred among motorized four-wheeler occupants and pedestrians, respectively [26]. A majority of victims arrived the hospital within an hour following injury, this is explained by the fact that the Limbe regional hospital is very accessible to the public, and the emergency department is functional every day. These attributes make it easier for the injured to be rushed to the hospital at all times, and care commenced on arrival.

The outcome of care at the emergency was marked by a mortality rate of 0.56%, and a vast majority (88.73%) were treated and discharged while a few were referred for continued care. Though other surveys suggest that death rates may have decreased due to a relatively improving prehospital and emergency response system in some African countries [25] [27] [28], the low death rate observed in our study isn't probably due to the same reasons because Cameroon still has a less functional prehospital and emergency response system. However,

in a prospective pilot cohort analysis in an urban area in Cameroon, emergency room mortality was 4.3% and riders were more likely to die than pillion passengers [29]. The low death rate observed in our study could be due partly to the benign nature of the observed lesions and partly the fact that at least half of the injured victims get to the hospital within an hour following the injury, thereby permitting prompt attention and care especially for those with life threatening injuries. It is worth noting that most deaths that occur at the crash site are usually not recorded and the corpses are either taken to the mortuary buried by relatives of the deceased. Death records at the crash site can be obtained only from police records or road safety officials.

5. Conclusion

In conclusion, our study suggests that despite the absence of effective road traffic injury surveillance systems, the trauma registry still reveals that the burden of road traffic injuries in south west Cameroon is high. Motorcycles are mostly involved alone or with pedestrians and/or cars. The mortality though low is surely an underestimation of the reality. The implementation of an effective road traffic surveillance system and improvement of the prehospital and emergency response system would help curb the fatalities due to road traffic injuries.

Limitation

This was a register based study and so doesn't give a true picture of the reality as in a community based study. Pre-hospital data are also lacking to complement our findings.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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