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Epidemiological Profile of Traumatic Injuries Caused by Road Traffic Crashes in Patients at CHR Kara Tomde

KOUMBIA Mkliwa[1*], DOSSOUVI Tamegnon[2], and KASSEGNE Iroukora[3]

[1]*Tokai University, Graduate School of Engineering, Department of Applied Sciences.*

[2]*General Surgeon, Department of General Surgery, CHU-Kara, Togo.*

[3]*General Surgeon, Department of General Surgery, CHR-Kara, Togo.*

[*]Correspondence:

KOUMBIA Mkliwa, Kanagawa-ken, Hadano-shi, Minami-Yana 2-26-1, Japan 257-0003, Tel: +81-70-2827-2505; E-mail: edouardkoumbia@gmail.com.

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ABSTRACT

Background: *Road Traffic Crashes (RTCs) are a real public health concern in the world. The situation is much more worrying in developing countries where approximately 93% of cases are recorded. However, it is often difficult to carefully monitor the situation and appreciate the impact of measures taken by governments to eradicate this problem due to the lack of up-to-date data. In Togo, most of studies carried out about road traffic crashes relate to the hospital CHU Sylvanus Olympio and to the city of Lomé.*

Objective: *To determine the frequency and nature of injuries contracted by RTCs patients at CHR Kara Tomdè.*

Results: *Our study revealed that approximately 673 road crashes victims of which 527 males and 146 females were admitted to this center during 2019 and 2020. The average age of the patients is 31 years. Several types of injuries have been encountered and the Traumatic Brain Injuries occupy the highest rate followed by fractures.*

Conclusion: *This study allowed the inventory of people victims of RTCs in the Kara region from 2019 to 2020. It revealed a high number of people victims of RTCs with a high prevalence of male's adult subjects. The proportion of child victims, although low, remains high.*

Keywords

Road Traffic Crashes, Traumatic Brain Injuries, Fractures, Ruptures of Tendons and Ligaments, Togo.

Introduction

Road Traffic Crashes (RTCs) are very frequent in the world and constitute a real public health concern. In 2000, around 1.2 million deaths related to road traffic crashes were reported in the world. This number rose to 1.35 million in 2018. The number of injured people by RTCs is estimated at around 50 million per year. Among this number, it is estimated that 93% cases occur in low- and middle-income countries [1-3]. According to the World Health Organization (WHO) 2018 report, the number of deaths from RTCs in the world for the first quarter of 2021 can be estimated to around 350 000 deaths [4]. In Africa, the number of victims of RTCs is estimated at around 27/100 000 people; a very high rate compared to rates in Europe and America [5]. The problem of RTCs concerns all actors involved in the health and people's well-being at a point that the WHO has included it in its agenda of sustainable development goals by 2030. According to the WHO, the number of RTCs and deaths related should be reduced by more than half by 2030 [6]. In Togo, given the high number of road crashes [7,8], the government has implemented a number of measures such as the wearing of helmets for motorcyclists, the ban on using the telephone while driving or driving in a drunken state; regular roadside checks, the introduction of the blood alcohol test and awareness-raising actions to reduce the rate of road crashes [9]. In hospitals, crashes cases continue to increase prominently at intensive care units. Road crashes (RTCs) occupy an important place among these crashes [10]. Also, pedestrians and motorcyclists

are the most victims of these crashes. For example, in the largest hospital of Togo (CHU SO), the frequency of admissions of RTCs patients is estimated to more than 24.9% compared to all admissions [5, 8]. During these crashes, several types of injuries can occur, sometimes leading to partial or total loss of certain parts of the body and in severe cases to death. When admitting and treating these patients, conservative treatment may be considered for small injuries. For large injuries, the surgery, and the use of artificial devices such as prostheses, implants etc... becomes essential to promote healing [11]. These devices not only are very expensive and difficult to access but also, some complications can occur, and complete recovery can take several months. Thus, in order to assess the impact of the various measures taken to reduce the number of RTCs and to allow better care of the injured people, epidemiological data is required [12]. The objective of this study is therefore to determine the frequency and nature of injuries gotten by RTCs patients at CHR Kara Tomdè.

Materials and Methods

This was a retrospective and descriptive study conducted from January 1, 2019, to December 31, 2020, in the general surgery department and intensive care unit of CHR Kara Tomdè. The CHR Kara Tomdè was appointed as the study place because it is one of the largest centers in the North region of Togo that receives the majority of RTCs patients. The study involved all RTCs patients regardless of age, sex, and type of injury who were admitted and treated in the hospital during the period of 2019 to 2020. All patients with incomplete records (no mention of age, sex, type of injury) and people with minor injuries admitted at the intensive care unit of the hospital were excluded from our study. The parameters studied were frequency, sex, age, type of injury. Figure 1 indicates some injuries encountered during the study. The collected data was analyzed using appropriate data processing software to minimize errors. JICA and CHR Kara Tomdè have approved this study and the consent was waived.

Figure 1: Some types of injuries encountered during RTAs: (A) Open leg fracture; (B) Crushing of limbs and pelvis.

Results

We recorded a total of 673 with 368 crash patients received in General Surgery in 2019 and 305 patients in 2020. The variation in the number of cases over these two years is shown in the diagram in Figure 2, 3.

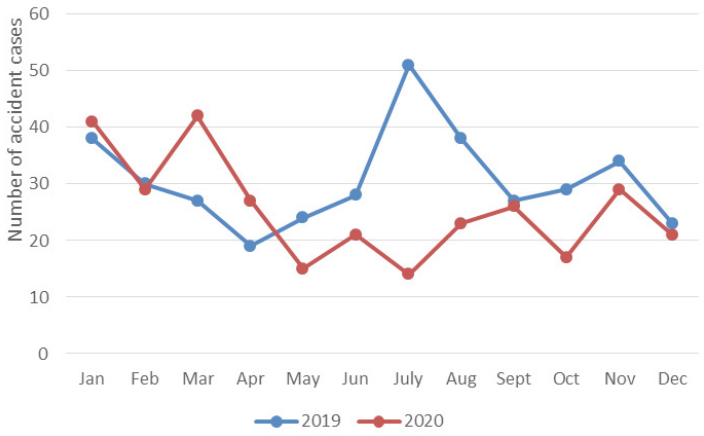

Figure 2: Evolution of the number of accidents in 2019 and 2020.

Figure 3: Evolution of the number of RTAs from 2019 to 2020.

Among the total number of recorded cases, there was 295 male patients (80.2%), and 73 female patients (19.8%) in 2019. In 2020, there were 232 male patients (76.1%) against 73 female patients (23.9%). Table 1 summarizes all the information relating to the distribution by sex.

Table 1: Breakdown of RTAs by sex and year.

	2019	**2020**
Male	295 (80.2%)	232 (76.1%)
Female	73 (19.4%)	73 (23.9%)
Total	**368 (100%)**	**305 (100%)**

The average age of the patients registered during this study period was 31 years with the extremes ranging from 1 to 85 years. The total number of children involved in these crashes is around 80 with 39 in 2019 and 41 in 2020. The percentage of children is 16.6% against 83.4% for adults among the 63.9% who's age is known in 2019. In 2020, there were 16.9% children's victims of

RTCs and 83.1% of adults out of a total of 79.3% of patients whose ages are well-known (Figure 4).

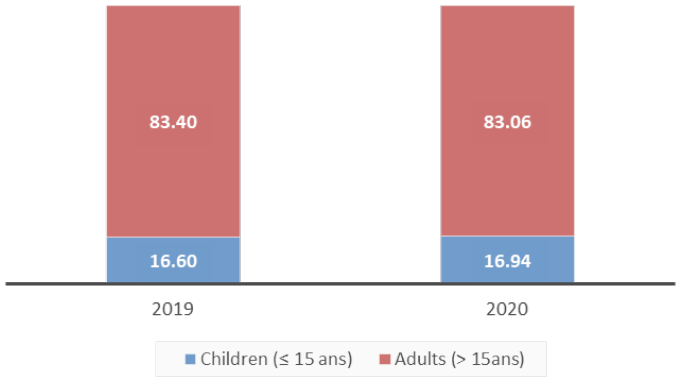

Figure 4: Percentage of children with stroke compared to adults.

The various injuries encountered were grouped into four categories as shown in Table 2. In 2019, the frequency of Traumatic Brain Injuries was 57.6% against 47.9% in 2020; the frequency of fractures was 24.7% in 2019 against 30.8% in 2020. Fractures include upper and lower limbs fractures, fracture of other bones. Regarding tendon / ligament ruptures, Wounds and contusions, the frequencies are respectively 1.4%; 16.3%; in 2019 and 2.0%; 19.3% in 2020.

Table 2: Distribution of different injuries per year.

	2019	2020
Traumatic Brain Injuries	212 (57.6%)	146 (47.9%)
Fractures	91 (24.7%)	94 (30.8%)
Tendon / ligament rupture	5 (1.4%)	6 (2.0%)
Wounds and contusions	60 (16.3%)	59 (19.3%)
Total	**368 (100%)**	**305 (100%)**

Discussion

The present study reveals a high number of RTCs patients admitted to Kara CHR during 2019 and 2020. This actual number has been less estimated because many people with minor injuries admitted at the intensive care unit of the CHU of Kara were not included in our study.

It appears a decreasing of around 17.1% in the number of injured cases from 2019 to 2020. This is in accordance with the report drawn up by the Togolese authorities for the second half of 2019 and the first half of 2020 [13]. This decrease has been accentuated from March to May 2020, which could be linked to the state of emergency declared throughout the country during that period because of the Covid-19 pandemic and which would have led to a considerable reduction in road traffic between cities [14]. In addition, it appears a strong increase first from April to July 2019 which is probably due to the festive period (traditional ceremonies and dances) of the Kara region in this period where several individuals drive in a state of drunkenness and non-respect of driving code. From December 2019 to January 2020, the RTCs victims also increased, and this is probably due to the end year holidays season as reported by previous studies to be a period in which many RTCs generally occur [15]. The vacillating number between May and July 2020 could be linked to the gradual resumption of activities and the relaxation of emergency measures. These findings can also be justified by the current situation of transportation means mostly used by people in this region. In fact, most people are using motorbikes because they are cheaper and convenient for accessing to many rural areas and their usage does not require a license. In contrast, cars are expensive, and roads conditions do not allow them to access to many rural areas. The users of motorbikes mostly drive with a high speed, rarely wear helmets, and usually violate traffic light. When asking witness at places where a crash occurred, many people reported that the driver was driving speedily and could not avoid the situation happening or, he was driving while using his telephone. In some circumstances, driving under alcoholic effects and lack of technical checking of the mean of transportation have been reported.

The distribution by sex shows that the male gender is the most exposed to RTCs compared to the female sex with 80.2% in 2019 and 76.1% in 2020. Although the male's rate is low, it remains clearly high compared to that of female RTCs patients [16].

Whether in 2019 or 2020, the proportion of adult RTCs patients is very high compared to that of children. This could be explained by the fact that adults are the most active and able to use means of transportation such as bikes which are involved in most RTCs. Also, these people, and more particularly the male sex, are the most alcohol consumers and often drive while being drunk although this is against the law. Moreover, many of male adult are involved in the activity called "Zemidjan" which is an important economic activity for people using motorbikes [8,17,18].

Traumatic Brain Injuries and fractures occupy an important place in the overall injuries recorded during the RTCs. These Traumatic Brain Injuries are often light when the driver or the person involved in the accident has worn their helmet properly. Otherwise, the trauma is severe and leads to admission into coma and or death [17]. Fractures affect the lower and upper limbs much more because of their exposure. The study also identified ruptures of tendons and ligaments which in most cases lead to loss of mobility of the affected limb or joint when the injury is large. This situation seriously affects families' incomes and the economy because many injured people are not covered by an insurance and therefore, cannot work anymore to take care for their families in case, they were self-employed. If the injured person was employed by a company, he will probably lose his job and if he did not subscribe to an insurance, he will not get any advantage or support for his treatment. The treatment of injured people is mostly done by a conservative method which takes long time, require a lot of financial resources and many visits to the hospital for care. All these require families to continue supporting their member who is injured, and this is painful. In case of students or children involved in these accidents, they can spend a whole year without going to school and this strongly affect their future. The use of implants or

artificial materials for treatment may enhance the healing ability but they are very costly so that many people are not able to use these materials.

Conclusion

This study shows that there are many people victim of RTCs in the Kara region. It revealed a high prevalence of adult males. The proportion of child victims, although low, remains high. The main injuries that often occur are Traumatic Brain Injuries and fractures. The main reasons for this high number of RTCs are the increase of motorbikes, their usage without a license, the violation of traffic light, high speed driving, the non-wearing of helmets, the alcoholic effects, and telephone usage while driving. All this requires strengthening actions that can help to considerably reduce the incidence of RTCs. In addition, this requires developing new and affordable therapeutic methods to increase accessibility in order to improve the care of RTCs patients.

Dissemination of results

The findings from this study were reported to the hospital's staff members where the study was conducted and to JICA by submitting a report containing these results.

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