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Trauma Related to Road Traffic Accidents at the Abéché University Hospital (Chad): Epidemiological and Injury Patterns in a Series of 972

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Abstract

Introduction: To describe the epidemiological profile, injury patterns, therapeutic management, and outcomes of road traffic accident (RTA)-related injuries managed at the Abéché University Hospital Center in eastern Chad. **Patients and method**s: This was a retrospective descriptive study conducted over a 12-month period, from September 1, 2023, to August 31, 2024. **Results**: This study included 972 patients admitted for RTA-related injuries out of 2,750 consultations, corresponding to a hospital frequency of 35.34%.The mean age of patients was 26.5 years, with the 21–30-year age group being the most represented (41.6%). Males predominated (82.1%), with a male-to-female ratio of 4.59. Students and pupils were the most affected socio-professional group (44.96%). Tricycle–motorcycle collisions were the most frequent mechanism of injury (51.75%). The most common lesions were dermabrasions (41.36%) and limb injuries (40.53%), mainly fractures. Head injuries accounted for 4.22% of cases, while polytrauma was observed in 3.60%. Management consisted mainly of local wound care (41.36%), orthopedic treatment (12.65%), and surgical intervention (9.57%). A high rate of discharge against medical advice was noted (24.69%). Overall hospital mortality was 9.53%, occurring predominantly in patients with severe head injuries and polytrauma. **Conclusion:** Road traffic accidents represent a major public health concern in the province of Abéché, predominantly affecting young men. Collisions involving tricycles and motorcycles are the leading cause of injury and are associated with severe trauma and high mortality. Strengthening road safety measures, improving prehospital medical transport, and upgrading hospital technical facilities, particularly critical care services, are essential to reduce RTA-related morbidity and mortality.

Keywords: Road traffic, rakshas, head trauma, Achebe, Tchad

Introduction

Road traffic injuries constitute a major public health problem in developing countries (Bandara et al., 2019). According to estimates by the World Health Organization (WHO), road traffic accidents were responsible for 1.19 million deaths worldwide in 2021 and remain the leading cause of mortality among children and young people aged 5 to 29 years, as well as the twelfth leading cause of death across all age groups (World Health Organization, 2023). In Cameroon, the prevalence of fractures resulting from road traffic accidents was reported to be 25.4% in the city of Ngaoundéré in 2016 (Jérémie et al., 2016). In Chad, a study conducted in N'Djamena in 2023 found that the hospital frequency of road traffic accidents involving two-wheeled vehicles was 19.9% (Andjeffa et al., 2023). The province of

Abéché is located 897 km from the capital city, N'Djamena. It is the third most populous city and the main urban center of eastern Chad, with a surface area of 29,980 km² (Municipality of Abéché, 2011). The objective of this study was to describe the epidemiological profile, injury patterns, therapeutic management, and outcomes of road traffic accidents in the province of Abéché.

Patients and methods

This was a descriptive study with an analytical aim, based on retrospective data collection over a 12-month period from September 1, 2023, to August 31, 2024. The study included medical records of patients treated for road traffic accident–related injuries at the emergency department and subsequently hospitalized or not in the surgical department. Included were male and female patients of all ages who were admitted and managed in the emergency and surgical departments of the Abéché University Hospital Center for recent trauma related to road traffic accidents during the study period, regardless of injury location. Patients with incomplete medical records and those who were declared dead on arrival at the emergency department were excluded. The variables studied included hospital frequency, age, sex, occupation, type of accident, time to admission, mode of transportation, imaging investigations performed, diagnosis, therapeutic indications, and mortality.

Results

During the study period, 2,750 patients were seen in the emergency and surgical departments, of whom 972 were admitted for road traffic accidents, representing a hospital frequency of 35.34%. The mean age of patients was 26.5 years (range: 5–75 years). The most affected age group was 21–30 years, accounting for 41.6% (n=405) of cases. Males predominated with 82.10% (n=798), yielding a male-to-female ratio of 4.59. Students and pupils were the most represented socio-professional group, accounting for 44.96% (n=437). Most patients originated from urban areas (77.98%, n=758), while 22.02% (n=214) came from rural areas. The most frequent type of accident was a collision between a tricycle and a motorcycle, representing 51.75% (n=503) of cases (Table I).

Table I: Distribution of patients according to the circumstances of the accident

Circumstances of Occurrence	n	%
Tricycle–motorcycle	**503**	**51,75**
Motorcycle–motorcycle	212	21,81
Motorcycle–car	80	8,23
Tricycle–car	81	8,33
Pedestrians	48	4,94
Car–car	32	3,29

Tricycle–tricycle	16	1,65
Total	**972**	**100**

Admission within less than 3 hours occurred in 55.97% of cases, while 10.08% (n=98) were admitted after more than 12 hours. The majority of patients (62.04%, n=603) were transported to the hospital by tricycle ("rickshaw"), followed by private vehicles in 32.92% (n=320) of cases; only 5.04% (n=49) were transported by ambulance. The highest number of accidents occurred in July, accounting for 26.54% (n=258) of cases. Substance use was reported in 32.92% (n=320) of cases for illicit drugs and 31.89% (n=310) for alcohol. Most patients (95.88%, n=932) were conscious on admission. Clinical deformity at the injury site was the most common lesion, observed in 75% (n=729) of cases, followed by open wounds in 11.73% (n=114). Standard radiography was the most frequently performed imaging investigation (72.02%, n=700), followed by ultrasound in 5.04% (n=49); 22.94% (n=223) of patients underwent no imaging. Dermabrasions accounted for 41.36% (n=402) of injuries. Limb injuries were found in 40.53% (n=394), including fractures in 35.60% (n=346) and dislocations in 4.94% (n=48). Head injuries were observed in 4.22% (n=41), including mild (1.95%, n=19), moderate (1.23%, n=12), and severe traumatic brain injuries (1.03%, n=10). Polytrauma was identified in 3.60% (n=35) of cases (Table II).

Table II: Distribution of patients according to the site of injury

Sites of Injury	**n**	**%**
Dermabrasions	**402**	**41,36**
Limb injuries	374	38,48
Head injuries	41	4,22
Polytrauma	35	3,6
Abdominal injuries	32	3,29
Thoracic injuries	26	2,67
Thoracolumbar spine injuries	25	2,57
Maxillofacial injuries	19	1,96
Cervical spine injuries	18	1,85
Total	**972**	**100**

Therapeutically, local wound care using saline solution was provided to 41.36% (n=402) of patients, orthopedic treatment in 12.65% (n=123), surgical management in 9.57% (n=93), and clinical observation in 4.42% (n=43). Discharge against medical advice occurred in 24.69% (n=240) of cases, mainly for traditional treatment or care in nearby health facilities, while 7.31% (n=71) were referred to tertiary hospitals in N'Djamena (Table III).

Table III: Distribution of patients according to the type of treatment

Type of Treatment	n	%
Local wound care	**402**	**41,36**
Discharge against medical advice	240	24,69
Orthopedic treatment	123	12,65
Surgical treatment	93	9,57
Referral	71	7,31
Clinical observation	43	4,42
Total	**972**	**100**

Referral indications were mainly limb fractures (1.95%, n=16), followed by cervical spine injuries (1.13%, n=11) and head injuries (1.03%, n=10) (Table IV).

Table IV: Distribution of patients according to the reason for referral

Reason for Referral	n	%
Limb fractures	**16**	**22,54**
Cervical spine injuries	11	15,49
Head injuries	10	14,08
Maxillofacial injuries	9	12,68
Polytrauma	8	11,27
Thoracolumbar spine injuries	8	11,27
Thoracic injuries	5	7,04
Abdominal injuries	4	5,63
Total	**71**	**100**

Among the 661 patients managed in our facility, 63 deaths were recorded, resulting in a mortality rate of 9.53%. Mortality predominantly affected patients with severe traumatic brain injury and polytrauma. Of the 10 patients admitted with severe head injury, 8 died, corresponding to a case fatality rate of 80%. Among polytrauma patients, 22 deaths were recorded out of 35 cases, yielding a fatality rate of 62.86% (Table V).

Table V: Distribution of patients according to the causes of death

Cause of Death	n	%
Polytrauma	**22**	**34,92**
Limb fractures	10	15,87
Abdominal injuries	9	14,29
Head injuries	8	12,7
Thoracic injuries	6	9,52
Maxillofacial injuries	3	4,76
Cervical spine injuries	3	4,76
Thoracolumbar spine injuries	2	3,18
Total	**63**	**100**

Figure 1: Extensive lacerated wound of the anterolateral aspect of the right leg (photographs from the emergency department of the Abéché University Hospital Center)

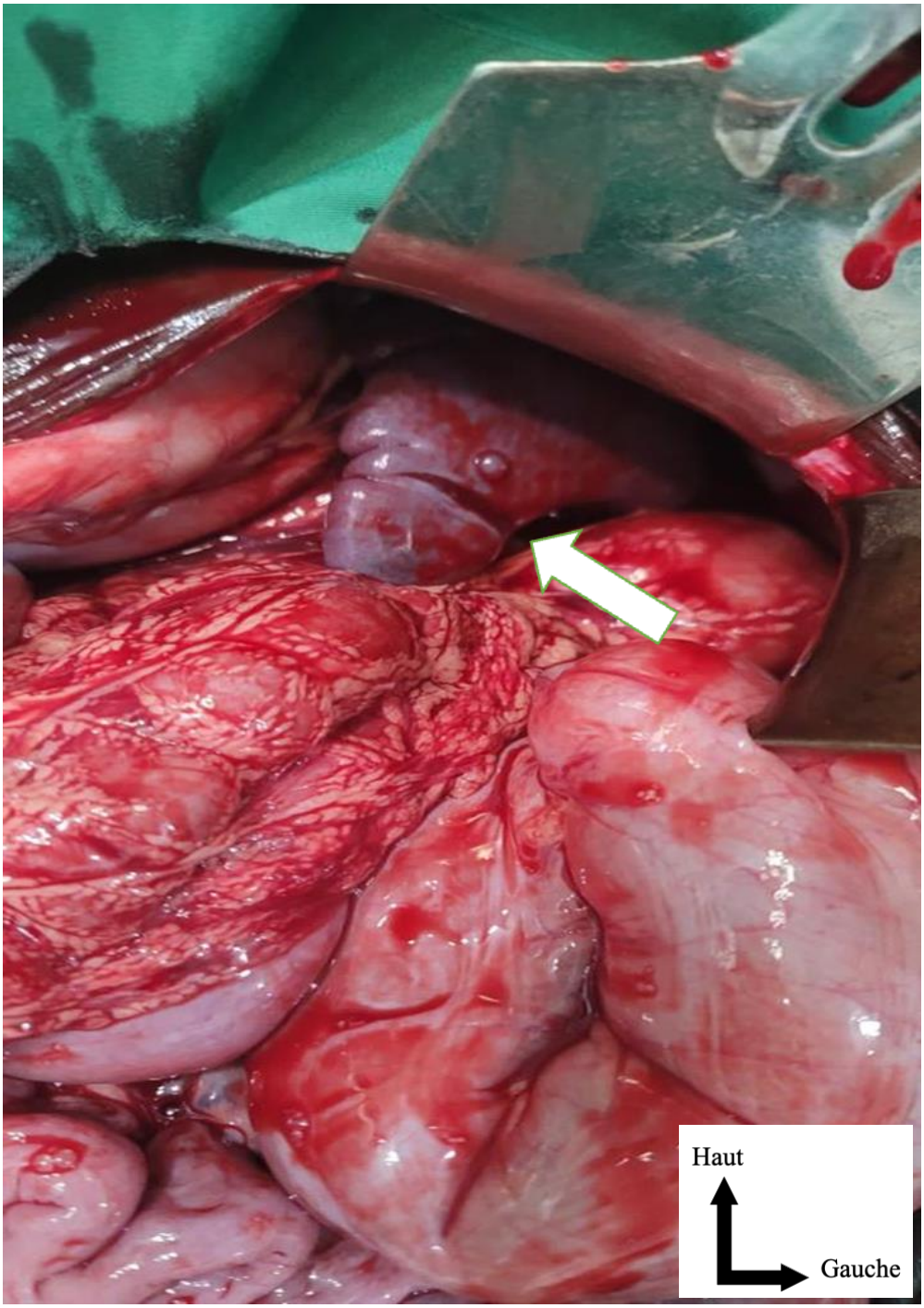

Figure 2: Abdominal contusion with splenic rupture (arrow) (photographs taken in the operating room of the Abéché University Hospital Center)

Figure 3: Radiographic image showing a fracture of the right femoral shaft (photographs from the emergency department of the Abéché University Hospital Center)

Discussion

This retrospective study, conducted from September 1, 2023, to August 31, 2024, included 972 patients admitted for road traffic accident–related trauma. Its limitations include the retrospective nature of data collection, the relatively small sample size, and the heterogeneity of injury sites. Road traffic accidents remain frequent in the province of Abéché, with a hospital frequency of 35.34%. They predominantly affect young males, with a mean age of 26.5 years and a peak incidence in the 21–30-year age group. These findings are consistent with those reported in the subregion. Omoke et al. in Nigeria reported a mean age of 31.2 ± 12.9 years with a peak incidence between 21 and 30 years (Omoke et al., 2019), while Diallo et al. in Burkina Faso reported a mean age of 31.18 years (Diallo et al., 2020). Young individuals are more prone to risk-taking behaviors, including alcohol and substance use, and represent the most economically productive segment of the population, resulting in substantial socioeconomic losses. Road traffic accidents result in multiple injuries, most commonly involving the limbs and the head, which are particularly exposed during crashes, especially in the absence of helmet use (Phillipo et al., 2010; Twagirayezu et al., 2008). Our findings align with the literature, with limb injuries in 40.53%, head injuries in 4.22%, and polytrauma in 3.60% of cases. Nearly one quarter of patients (24.69%) were discharged against medical advice to seek traditional treatment. This proportion is higher than that reported in the literature. Abdoul Wahab et al. in Niger reported a rate of 8.6% (Abdoul Wahab et al., 2020). Discharge against medical advice is common in Africa (Aderibigbe et al., 2013; Nardos et al., 2019; Kuubiere et al., 2015) and is often related to lack of awareness, financial constraints, or spiritual beliefs. The hospital mortality rate from road traffic accidents in Abéché was 9.53%, higher than rates reported in the literature. Kalli et al. in N'Djamena and Tékpa et al. in Bangui reported mortality rates of 4.1% and 4.2%, respectively (Kalli et al., 2021; Tékpa et al., 2019). Mortality mainly affected patients with severe head injuries and polytrauma. This high mortality may be explained by non-medical transportation of victims using tricycles, the absence of an intensive care unit at the Abéché University Hospital Center, and the long distance (897 km) separating Abéché from the capital, which complicates referral to facilities with advanced resuscitation capabilities.

Conclusion

Road traffic accidents are frequent in the province of Abéché and represent a significant public health problem. They predominantly affect young males and are most often caused by collisions between tricycles and motorcycles. Strict enforcement of basic road safety measures and the strengthening of the healthcare system with better-equipped technical

facilities could improve road safety and significantly reduce hospital mortality among road traffic accident victims.

Conflict of Interest: The authors reported no conflict of interest.

Data Availability: All data are included in the content of the paper.

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Declaration for Human Participants: This study has been approved by the Scientific Committee of the Abéché University Hospital Center, and the principles of the Helsinki Declaration were followed.

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