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Epidemiological and Clinical Profile of Limb Injuries Related to Motorcycle Accidents in Toamasina, Madagascar

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Abstract

Introduction

Road traffic accidents remain a major cause of morbidity and mortality worldwide. Motorcyclists are particularly vulnerable due to the absence of structural protection. In Madagascar, recent hospital-based data on limb injuries related to motorcycle accidents are scarce. This study aimed to describe the epidemiological, clinical and therapeutic characteristics of limb injuries resulting from motorcycle accidents managed at CHU Morafeno Toamasina.

Methods

A retrospective descriptive study was conducted over a three-year period, from January 2021 to December 2023, in the Orthopedic and Traumatology Department of CHU Morafeno Toamasina. All patients admitted with limb injuries following road traffic accidents involving motorcycles were included. Data were analyzed using Excel

and Epi Info 7 software.

Results

Among 265 patients admitted for road traffic accidents, 198 cases (74.7%) were related to motorcycle accidents. The mean age was 32.6 years, with a male predominance (63.6%). Lower limbs were the most frequently injured (69.8%). Fractures accounted for 59.1% of injuries, including 20.7% open fractures. Surgical management was required in 38.4% of cases. After a mean follow-up of three months, outcomes were favorable in 69.2% of patients.

Conclusion

Motorcycle-related limb injuries are frequent in Toamasina and mainly affect young adults. The severity of these injuries highlights the need to strengthen road safety prevention strategies and optimize trauma care.

Keywords: Road Traffic Accident, Motorcycle, Limb Injury, Fracture, Madagascar

Introduction

Road traffic injuries represent a major public health issue, particularly in low- and middle-income countries. According to the World Health Organization, road traffic accidents account for more than one million deaths annually [1]. Among road users, motorcyclists are especially vulnerable due to direct exposure during collisions and the lack of effective protective structures [2].

In many settings, the increasing use of motorcycles as an affordable means of transportation has been accompanied by a rise in severe injuries. Limb injuries are particularly frequent and are associated with long-term functional impairment and significant socioeconomic consequences.

In Madagascar, especially in the city of Toamasina, motorcycles are widely used for daily transportation. However, recent hospital-based data describing limb injuries related to motorcycle accidents remain limited. This study seeks to contribute to a better understanding of this issue in a regional hospital context.

Methods

We conducted a retrospective descriptive study in the Orthopedic and Traumatology Department of Centre Hospitalier Universitaire Morafeno Toamasina, the main referral center for trauma care in the Atsinanana region. The study period extended from January 1, 2021 to December 31, 2023.

All patients, regardless of age or sex, admitted with limb injuries resulting from road traffic accidents involving motorcycles were included. Patients without limb injuries, those transferred early to another facility, and incomplete or unusable medical records were excluded.

Data were collected from admission registers, medical records and operative reports. Variables included sociodemographic characteristics, accident circumstances, type and location of injuries, therapeutic management and clinical outcomes. Data analysis was purely descriptive.

Results

During the study period, 265 patients were hospitalized for road traffic accidents. Among them, 198 patients (74.7%) sustained injuries related to motorcycle accidents. The mean age was 32.6 years, with most patients aged between 20 and 50 years. Males accounted for 63.6% of cases.

Motorcycle riders represented the majority of victims. Lower limbs were the most commonly affected body segments (69.8%). Fractures were the most frequent injuries (59.1%), including 20.7% open fractures. Surgical treatment was performed in 38.4% of cases, while orthopedic management was used in 37.4%.

After a mean follow-up of three months, outcomes were favorable in 69.2% of patients. Complications occurred in 30.8% of cases, mainly infections. Three deaths (1.5%) were recorded.

Discussion

This study highlights the significant contribution of motorcycle accidents to the burden of limb injuries in Toamasina. The predominance of young adult males is consistent with international findings, reflecting greater exposure to motorcycle use and risk-taking behaviors in this population group^[3,4].

The high frequency of lower limb injuries can be explained by their direct exposure during motorcycle crashes. The substantial proportion of fractures, particularly open fractures, reflects the high-energy mechanisms involved and the lack of adequate protective equipment among motorcyclists.

The frequent need for surgical management underscores the severity of the injuries encountered. However, the relatively high rate of complications, particularly infections, may be related to delays in hospital presentation and prior use of traditional treatments. Despite these challenges, favorable outcomes in most patients emphasize the importance of timely and specialized trauma care^[5].

This study has limitations, including its retrospective and single-center design, which may limit the generalizability of the findings. Nevertheless, it provides recent local data that may inform preventive strategies and improvements in trauma care.

Conclusion

Motorcycle-related limb injuries constitute a major public health concern in Toamasina. They predominantly affect

young, economically active adults and are often severe. Strengthening road safety prevention measures and improving trauma care systems are essential to reduce the associated morbidity.

Competing interests

The authors declare no competing interests.

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