

Motorcycle Trauma in a St Lucian Hospital

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ABSTRACT

Objective: A motorcycle is a single-track, two-wheeled motor vehicle that is used worldwide for transportation. The use of the motorcycle has resulted in trauma that is associated with significant morbidity and mortality. The aim of this study is to document the pattern of motorcycle accidents and the demographics of the cyclists in St Lucia.

Method: This is a 15-month prospective study on all patients with motorcycle injuries that reported to the emergency room at the Victoria Hospital. Information on patients: age, gender, helmet use, intake of alcohol/drugs before the motorcycling and mechanism of injury were obtained and filled into a prepared proforma by the attending physician. Those admitted were followed-up to know the outcome and complications of treatment.

Results: Total number of patients studied was 136 in 115 accidents, males (M) were 127 while females (F) were 9, with M:F ratio of 14.1:1.0. There were 105, 28 and 3 riders, passengers and pedestrians respectively; 87.5% of the patients were below the age of 35 years. Fifty-three per cent of the accidents occurred over the weekend. The limbs were mostly injured, constituting 81.9% of the parts of the body injured.

Conclusion: The study revealed that young and productive males were mainly injured in motorcycle accidents and the injuries were more in the limbs. More than fifty per cent of the accidents were found to occur during the weekends and more than fifty per cent of the motorcyclists were not wearing crash helmets.

Keywords: Motorcycle, St Lucia, trauma

Traumas por Motocicletas en un Hospital de Santa Lucía

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RESUMEN

Objetivo: La motocicleta es un vehículo motor dos ruedas y vía única, usado mundialmente como medio de transporte. El uso de la motocicleta ha traído consigo traumas asociados con una morbilidad y una mortalidad significativas. El objetivo de este estudio es documentar el patrón de accidentes de motocicletas así como la demografía de los ciclistas en Santa Lucía.

Método: Se trata de un estudio prospectivo de 15 meses en torno a pacientes con lesiones de motocicleta. Los heridos acudieron a la sala de emergencias del Hospital Victoria. Se obtuvo información sobre los pacientes – edad, género, uso del casco, consumo de alcohol/drogas antes de montar la moto, y el mecanismo de la lesión. Con la información obtenida una pro forma fue preparada por el médico asistente. A los ingresados se les hizo un seguimiento a fin de conocer la evolución clínica y las complicaciones del tratamiento.

Resultados: El número total de pacientes estudiados fue 136 en 115 accidentes. Los varones (M) fueron 127 mientras que las hembras (F) fueron 9, para una proporción M:F de 14.1: 1.0. Hubo 105, 28 y 3 motoristas, pasajeros y peatones respectivamente. El 87.5% de los pacientes estaban por debajo de los 35 años de edad. Cincuenta y tres por ciento de los accidentes ocurrieron durante el fin de semana. Las extremidades fueron principalmente dañadas, constituyendo el 81.9% de las partes del cuerpo lesionadas.

Conclusión: *El estudio reveló que los lesionados en accidentes de motocicletas eran principalmente varones jóvenes y productivos, y que las lesiones eran mayormente en las extremidades. Se halló que más del cincuenta por ciento de los accidentes ocurrieron durante los fines de semana, y más del cincuenta por ciento de los motociclistas no llevaban el casco de protección.*

Palabras claves: Motocicleta, Santa Lucia, trauma

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INTRODUCTION

A motorcycle, also called motorbike, is a single-track, two-wheeled motor vehicle that is used worldwide for transportation. It is one of the most affordable forms of motorised transport in many parts of the world and for most of the world's population; they are also the most common type of motor vehicles.

The use of the motorcycle has resulted in trauma that is associated with significant morbidity and mortality. Trauma caused by motorcycle-related injuries is extensive, expensive and is increasing globally (1, 2). Per vehicle mile travelled, motorcycle riders have a 34-fold higher risk of death in a crash than people driving other types of motor vehicles (3). In the United Kingdom, a motorcyclist is killed or seriously injured every 665 894 km, compared with 18 661 626 km for cars (1, 3). According to the World Health Organization (WHO) statistics, some 1000 people under the age of 25 years are killed in road accidents worldwide everyday and 85 per cent occur in low and medium-income countries (4). The WHO is considering deaths and injuries from motorcycle accidents as a "public health epidemic" in many countries in Asia and many other countries of the world where it is used for commercial transportation (4).

Despite their popularity, the inherent nature of motorcycles makes riding them potentially dangerous. Unlike cars and other vehicles, motorcycles offer drivers and passengers no protection. There is nothing between the rider and the open road other than the clothes the rider is wearing and possibly a helmet. Motorcycles are less stable than cars during manoeuvres such as emergency braking and swerving. When motorcyclists crash, they lack the protection of an enclosed vehicle so they are more likely to be injured or killed.

This prospective study was done because there has been very few studies in the Caribbean on motorcycle accidents and none in St Lucia. In our emergency room, severe, sometimes mutilating and fatal cases of motorcycle accidents are seen and this has also stimulated this study to document the pattern of the injury and the demographics of cyclists, and to make some recommendations.

SUBJECTS AND METHODS

This is a prospective study on all patients with motorcycle injuries that reported to the emergency room of the Victoria Hospital, St Lucia between May 2009 and July 2010. Appro-

val for the study was obtained from the hospital and consent from the patients. The injured patients were resuscitated and stabilized in the emergency room. Emergency room resuscitative procedures and treatment were obtained and collated. Information on patients including: age, gender, helmet use, intake of alcohol/drugs before the motorcycling and mechanism of injury (for 50 accidents) were obtained and filled into a prepared proforma by the attending physicians in the emergency room. The date of injury was also documented.

Those admitted were followed-up to know the duration of admission, definitive treatment, outcome and complications of treatment. All information was entered and analysed with Microsoft Excel.

RESULTS

The total number of patients studied was 136 in 115 accidents, males were 127 while females were 9 with a male:female ratio of 14.1:1.0. There were 105, 28 and 3 riders, passengers and pedestrians respectively that were involved in the accidents. All the riders (105) with their 21 passengers, the pedestrians (3) and additional 7 passengers (without the rider) presented in the emergency room. The age range of the patients was from 15–72 years with average of 27.93 ± 8.36 years. The total number of accidents in the study period was 115 with a mean number of accidents per month being 7.7 and the mean number of patients per month being 9.1 (Table 1).

The age distribution of patients ranged from 15–75 years of age with the majority of patients being between 15–35 years (Table 2).

Most accidents took place on the weekend and a significant percentage of patients did not wear helmets. About forty-five per cent had taken alcohol/marijuana (Table 3). Most patients had multiple injuries (Tables 4 and 5).

Thirty-four patients were admitted ranging from 1–32 days with an average of 5.3 days. Four patients were admitted to the three-bedded intensive care unit (ICU) for a combined period of 20 days. Fifteen patients had major surgeries. Five severe head injuries were recorded in the study; four patients died and one was referred to a neighbouring island for specialized care. The mechanisms of accident in 50 of these were collision between motorcycles and collision with other vehicles ($n = 20$), fell off the motor-cycle ($n = 21$), wheeling [pump-up] ($n = 3$), pedestrian hit by motorcycle

Table 1: Number of patients seen per month

Month	2009	Number
May		5
June		6
July		7
August		8
September		10
October		3
November		10
December		17
	2010	
January		11
February		9
March		5
April		13
May		13
June		12
July		7
Total		136

Average number of patients per month = 9.1; number of accidents = 115; average number of accidents per month = 7.7

Table 2: Age distribution of patients

Age range	Number	Percentage
15–25	62	45.6
26–35	57	41.9
36–45	10	7.4
46–55	6	4.4
56–65	–	–
66–75	1	0.7

Table 3: Days of accident, alcohol intake and use of crash helmet

Total number of riders/accidents/patients	Number of riders with ROH, accidents per week days, patients with helmet	Percentage (%)	Total percentage (%)
105 (riders)	ROH/pot intake = 47 Weekend = 22 Monday = 10 No ROH/pot	44.8 55.2	100
115 (accidents)	Weekend = 61 Monday = 20 Tuesday–Thursday = 34	53.0 17.4 29.6	100
136 (patients)	*Crash helmet = 61 **No crash helmet = 72 Pedestrians = 3	44.9 52.9 2.2	100

Weekend = Friday–Sunday; ROH = alcohol; Pot = marijuana
 *56 riders (drivers) were helmeted out of 105 = 53.3%; five passengers were helmeted out of 28 = 18%
 **4 died from severe head injury

Table 4: Parts of the body injured

Part of body	Number of patients	Percentage
Head and neck	24	17.6
Chest	11	8.1
Abdomen	8	5.9
Upper limbs	46	38.2
Lower limbs	73	53.7

Table 5: Pattern of tissue trauma

Injury	Numbers and percentage n (%)
Soft tissue injury (abrasions, frictional burns, joint sprains and lacerations)	130 (95.6)
Head injury	18 (13.2)
Fractures	
Tibia and fibula	19 (14)
Hand and foot bones	8 (5.9)
Femur	6 (4.4)
Radius/Ulna	6 (4.4)
Mandible	2 (1.5)
Clavicle	2 (1.5)
Patella	2 (1.5)
Scapula	1 (0.7)
Dislocation	5 (3.7)
Shoulder, ankle, foot joints	

Note: Most of the patients had multiple injuries

(n = 3), spinning the motorcycle 360 degrees (n = 1) and mechanical fault (n = 1).

DISCUSSION

One hundred and thirty-six patients in 115 accidents were studied over a 15-month period with an average of 9.1 patients per month and 7.7 accidents per month (Table 1). The highest number of patients was in the month of December and that could be related to the festive mood of the period.

The study revealed that males were more injured than females with a male:female ratio of 14.1:1.0 and this showed the greater vulnerability of males to trauma in motorcycle accidents in St Lucia. This very high male:female ratio could be explained by the fact that the motorcycle is not used for commercial transportation as practised in many countries of the world where both sexes are at risk of injury (4–6) and riding a motorcycle is more of a male activity. The age of patients ranged from 15–72 years with an average of 27.9 ± 8.4. Table 2 shows that 87.5% were below the age of 35

years; this is similar to the report of Agnihotri *et al* on patterns of road traffic injuries with the highest incidence being amongst the male population in the productive age group of 16–30 years (7). [This could lead to decline in production and reduction or lack of income when the patients are sole breadwinners for their families]. Some patients were below the riders licensing age, thus there should be strict enforcement of the law that prohibits people below the licensing age from riding motorcycles. Thirty-four of these patients were admitted to hospital for 1–32 days with an average of 5.3 days per patient.

Some of these accidents were avoidable as illustrated by one of the patients who was riding on the rear tyre – pump-up/wheeling; the patient was involved in six accidents on the same day as a result of wheeling and ended up being admitted on the sixth accident. The available limited admission facilities and other resources could be better utilized for other patients if these avoidable motorcycle accidents were decreased.

The study revealed that about 70% of the accidents happened between Friday and Monday and more than half of these accidents occurred between Friday and Sunday (Table 3). This could be attributed to the hangover of weekend pleasures. This is supported by the finding that 47 (36.2%) of the patients had just used alcohol or marijuana before the accident occurred, of which 32 (68.1%) of the alcohol/marijuana intake occurred over the weekend. Introduction of an alcohol breath-analyser could reveal the motorcyclists who ride under the influence of alcohol and thus reduce the number of accidents and the associated morbidity and mortality. Alcohol has been identified as a major contributing factor to fatal crashes (8) and enforcement of legal limits on the blood alcohol concentration has been mentioned to be effective in reducing motorcycle deaths (1). Seventy-two (52.9%) patients did not wear crash helmets, including the five patients who had severe head injuries. Some of those who wore the crash helmet did not fasten the helmet well. Education and law enforcement on the wearing of crash helmets would go a long way in reducing the severity of head injury in motorcycle accidents. Passmore *et al* reported that crash helmets reduced the risk of head injury by as much as 18 per cent and it has also been reported that the differential healthcare economic burden between unhelmeted and helmeted motorcyclists is approximately \$250 231 734 per year (US) and underscores the need for updated legislation to improve motorcycle helmet utilization (2, 9).

Table 4 shows the parts of the body mostly injured in this study to be the limbs which jointly made up 91.9%: with upper limbs 38.2% and lower limbs 53.7% respectively. The lower limb injury percentage is similar to data from Hurt *et al* (8).

In a study in Jamaica, common injuries were as follows: soft tissue trauma 100%, head injuries 53.0%, long bone fractures 46.7%, abdominal injuries 14.1%, thoracic

injuries 26.3%, vascular injuries 4.1% (10). This present study agrees that soft tissue injury was the commonest (95.6%) but this was followed by fractures (33.8%) and head injuries (13.2%) as shown in Table 5. In a study in urban India, head injuries accounted for the major proportion of injuries sustained in motorised two-wheeled vehicle users (11).

In summary, the study revealed that young and productive males were mainly injured in motorcycle accidents and the injuries were more in the limbs than any other parts of the body. More than fifty per cent of the accidents were found to occur during the weekend and more than fifty per cent of the motorcyclists rode without crash helmets.

We, therefore, recommend that there be a public education programme on the high risks associated with motorcycling without a crash helmet; a law banning motorcycling without helmet use should be promulgated and likewise, promulgation into law and enforcement of legal limits on the blood alcohol concentration. These recommendations, we believe, will lead to reduction of motorcycle accidents and the associated morbidity and mortality.

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