ORIGINAL RESEARCH

Factors related to motorcycle accidents with victims: an epidemiological survey

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OBJECTIVE: To evaluate the factors associated with traffic motorcycles accidents.
METHODS: The sample consisted of 285 motorcycle accident victims in São Paulo. Data were collected from 24-hour emergency service shifts regarding: conditions of the victims, security equipment, road and vehicle conditions.
RESULTS: Victims were mostly young men (92%); 23% used the motorcycle for work (average: 8 hours per day); 45% had owned a motorcycle for less than two years; 77% were licensed motorcycle drivers; 33% had less than four years of qualification; 31% had attended a course of defensive driving. Severe lesions were identified in 67% of the unlicensed drivers. Polytrauma occurred in 9% head trauma in 5% of the entire population. Lower limb fractures occurred more frequently than upper limb (17% vs. 12%). Most wore helmets (90%) but only 18% wore helmet, boots and jacket. Positive readings for alcohol (7%) and drugs (14%) occurred in 21% of victims. Most accidents occurred as a consequence of imprudence (88%), during the day (67%), in dry weather conditions (94%). A side impact was registered in 48% of cases; 80% of motorcycles had an engine capacity up to 250 cc. In 51% of the accidents the person responsible for the accident was the driver of the other vehicle in the accident.
CONCLUSION: Most accidents involve motorcyclists who are young male adults, use the motorcycle as a means of transport and do not consider safety, defensive driving and the use of alcohol and drugs as important factors.

KEYWORDS: Motorcycle, Accidents, Epidemiology, Trauma.

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INTRODUCTION

The resources of the Brazilian Unified Health System (SUS) applied to care for patients entering emergency rooms, hospitals and rehabilitation centers because of external causes of morbidity and mortality are increasing, particularly because of the increased number and severity of injuries resulting from traffic accidents. The increase in the fleet of vehicles is certainly one of the major factors, but experts[1-3] also point out other causes responsible for the progression of these numbers over the last ten years.[4] In 2010, 1.24 million people died worldwide as a consequence of traffic accidents: half of these deaths were pedestrians, cyclists and motorcyclists; 92% of these deaths involved people included in low- and middle-income brackets.[5] Deaths from traffic accidents average 17.4/100 000 inhabitants, worldwide, ranging from 2.8 to 32.4/100,000 in Sweden and the Democratic Republic of Congo, respectively; Brazil has a considerably higher than average ratio, at 23.4/100 000 inhabitants, ranking third worse in America, only better that the Dominican Republic and Venezuela.[5,6] The rapid growth of the motorcycle fleet (619% from 1998 to 2012) with a consequent increase of 753% in the number of motorcyclists killed in traffic accidents in Brasil[1,7,8] (1998: 1,047 deaths; 2008: 8,939 deaths; 2011: 11,433 deaths) indicates a relationship that requires efficient and urgent public policy actions. In the North and Northeast of Brazil, regions at a lower level of economic development, the number of deaths in relation to the size of the fleet is higher than the national average.[7] The risk

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of a motorcyclist dying in traffic is 14 times greater than that of a motor car passenger or driver.[6,7] A large Brazilian Insurance Company (Seguradora Lider) indicates that 76% of compensations through compulsory insurance are paid for motorcycle accidents, 19% for cars, 5% for all other types of vehicles.[8] In the city of São Paulo there are about 800,000 bikers, and 200,000 work as "motoboy" (deliverers of small packages and urgent mail)[9] and the motorcycle is now generally characterized as a transport option. Out of a total of collisions with fatalities in the city 42% involve a motorcycle and a car. The prehospital care for accident victims is on the increase and is related to the growth of the fleet, but other factors, such as the lax rules for licensing of drivers and vehicle inspection are also relevant. Data from the Hospital das Clínicas, Faculty of Medicine, University of São Paulo[10] show that 43% of the admittance to the surgical section of the emergency service were trauma victims; among the most seriously injured, automotive accident victims predominate, with pedestrians at the top of the list, followed by motorcyclists. In 2010, 6,848 patients were treated for trauma, 19.3% (n = 1284) of which were traffic accidents and 45% of these (n = 582) were motorcycle accident victims. There was a 20% increase in the number of severe cases seen in the emergency unit of the Institute of Orthopedics and Traumatology of Hospital das Clínicas, mainly polytrauma with complex and multiple fractures (with a 600% increase for brachial plexus injuries, 110% for the number of amputations and 25% for spinal cord injury). These accidents have serious consequences that require long treatment periods and patients frequently do not return to the life conditions prevalent prior to the accident. The growth of the fleet and the number of inexperienced drivers, the use of motorcycles as a family vehicle, as a transportation vehicle for clients (motorcycle taxi) and goods (motofreight) are intrinsic factors at the origin of accidents. Several points must be considered: (a) increased urban mobility and regulations regarding the shared use of public roads, (b) insufficient quality of licensing and training of motorcyclists, (c) inadequate use and quality of motorcycle safety equipment (d) ineffective supervision and the lightness of sanctions imposed on offenders. Therefore, the objectives of this study were to evaluate the factors associated with traffic accidents with motorcycles occurring in the Western Zone (Zona Oeste) of São Paulo. This district has a resident population approximately 300,000, out of a total of 10 million inhabitants of the municipality of São Paulo; the Human Development Index of the region is high.

METHODS

Sample. The sample consisted of non-fatal and fatal victims of motorcycle accidents either (a) occurring in the Western Zone of São Paulo or (b) admitted for treatment in the emergency units included in this study for patient collection in the days assigned to the study, as specified below.

Data were collected at the scene of accidents and at the designated emergency services throughout an 82-day period between February 19 and May 12, 2013: a total of 328 shifts were active collecting data. The occurrence of accidents was notified by the Fire Brigade Coordination Center (COBOM) to the Traffic Engineering Company (CET) and to the team of accident experts at the collection units. Upon notification, CET personnel and experts were dispatched to the accident site for collection of accident data.

The inclusion criteria were: (i) accidents involving motorcycles in in the Western Zone of the city of São Paulo, within the collection shift periods (ii) motorcycle drivers over 18 years old involved in the accidents; (iii) non-fatal victims treated in the emergency units included for collection; (v) fatalities occurring in the hospital or at the scene of the accident.

The exclusion criteria were(i) victims of motorcycle accidents occurring more than six hours before notification; (ii) accident victims transferred from other units or returning after previous treatments (iii) victims who were passengers of/or run over by the motorcycle involved in the accident.

Collection Procedures

Emergency Units. Collection teams were distributed as follows: Hospital das Clínicas, University Hospital of the University of São Paulo, Bandeirantes Municipal Emergency Unit, Lapa Municipal Emergency Unit.

Shifts in Hospital das Clínicas. Based on a pilot study, Hospital das Clínicas and University Hospital held 24-hour shifts, while the two Emergency Units held twelve-hour daytime shifts. Collection was performed on alternate days within the period 19 February to 12 May 2013, as stated above. Therefore, 82 days of shifts in the four selected units yielded a total of 164 24-hour and 164 12-hour collection shifts.

The identification and inclusion of the accident and the information gathered at accident scene were made at the time of each accident. All victims meeting the inclusion criteria were included in the study. All motorcycle accidents in the Western Zone were successfully collected and the study contains all the data from every accident scene and appropriate data from all accident victims.

Collection teams. The collection teams at the hospital units were headed by an expert in accidents and included health professionals, graduate and undergraduate medical students.

All personnel were trained in the management of patients, in the completion and obtaining of informed consent signature and in the filling of the spreadsheet.

Collected information. Personal information was collected, and biological samples were taken for toxicological analysis for: alveolar air by breathalyzer, saliva collection, urine and blood. Collected samples were placed in coolers. A complete physical examination report for each patient was included in the study.

Accident Data collection at the crash site included: date and time, location of the crash site, route and weather conditions, traffic signaling, type and condition of the vehicle and other information. Some deaths occurred at the crash site, but the prehospital care units are activated, and these accidents were included in the sample. The sheet used was the same as commonly used by agents in the service of these events. The victims of these accidents, which were sent to hospitals, were also assessed by the duty collectors. These data, after consistency analysis were included in the database. To relate the data collected in different locations, the duty engineer created an index number of accident that should be used at all stages of the collection process. A team of experts, coming from Porto Seguro Insurance, was trained by a retired expert of the Scientific Police to gather information about the accident at the crash site. The expert, remained on duty in the CET Information Center, and when allerted by the duty coordinator or by COBOM headed to the crash site to collect the information.

Statistical Evaluation

The sample size was pre-estimated at 282 entries, for an alpha error of 0.05 and beta error of 0.20 according to the expected proportion of alcohol in 10% (6.5 to 13, 5%) of cases. Losses and negative cases were estimated at 10%, corresponding to a collection of 314 cases. Data were presented as mean ± standard deviation, as well as frequency and percentage. Analyzes were performed using the Predictive Analytics Software version 17.0 for Windows package (SPSS, Inc., Chicago, IL). The level for statistical significance was 5% ($p < 0.05$).

RESULTS

A total of 326 of motorcycle accident victims treated in emergency rooms by health staff were harvested. Data on 41 patients were not included because of excessive data loss. The mean age was 29.7 ± 8 (18-70) years. Table 1 provides a general description of circumstances surrounding patients included in the study. Ninety-five percent of total victims in the sample (311) were male. Thirty-two percent (103 victims) had National Health Insurance (INSS-SUS). Fifty-six percent were married, 58% had secondary or higher education and 50% had a family income above three minimum wages. Sixty-eight percent (219 victims) of the sample were motofreight workers using the motorcycle as a transport vehicle and 23% (76 victims) used the motorcycle for transport to the workplace. The motofreight workers ran (average) eight hours a day and motorcyclists two hours. Fifty-five percent had been involved in previous accidents and 18% had previous admissions because of accident.

Outcome. Table 2 provides data on the outcome of the included patients: one third of the patients was discharged from the emergency unit, whereas two thirds were either admitted to first attendance hospital or transferred to a different hospital

Driving license. Table 2 also provides information on driving competence of bikers. Twenty-three percent of victims had no license to drive a motorcycle and 33% had less than four years of experience; 45% had owned a motorcycle for less than two years. Seventy-five percent of the unlicensed victims were less than 32 years of age. Sixty-seven percent of victims had never attended driving schools (47% of motofreight workers and 31% of motorcyclists).

Table 3 provides information on injuries as related to safety equipment used by the victims. Forty-four percent of patients had severe injuries. Seventeen percent had lower limb fractures and 12% of upper limbs, 9% had polytrauma and 5% had brain trauma. Twenty-eight percent (93 victims) cases were hospitalized, seven patients died (2%) and 56% were discharged from the emergency unit.

Safety equipment. Ninety-two percent of the victims wore helmets. Twenty-three per cent wore boots and 18.1% wore jackets. Eighteen percent wore helmet, boots and jacket.

Use of drugs. Twenty-one percent of the victims showed a positive dose for alcohol/drugs in at least one biological sample. Twelve percent used alcohol and 8.7% used other drugs. After alcohol, cocaine is the drug most commonly found. One out five victims were using alcohol or drugs at the time of occurrence of the accidents.

Accident information. Twenty-five percent of the accidents occurred with motorbikes transporting passengers. Accidents happen more frequently at traffic peak times to bikers going to or coming from work, without preference for weekday. Eighty-six percent of the accidents occurred in good weather. The side impact crash was the most common (40%), followed by the rear end collision (25%) and fall (20%). Self-reporting victims informed that 15% of accidents occurred in the "corridor" between vehicle lanes; however, this self-reporting is in contradiction with the high occurrence of side collisions, which are typical for the "corridor". Seventy-three percent of accidents involved another vehicle; the car vs. motorcycle interaction occurred in 78% of these accidents. Fourteen percent of the victims admitted to personal failure as the cause of the accident.

Road condition and signage. Ninety-seven percent of the roads were paved. Fifteen percent of the victims cited the road conditions as a cause (the presence of water, oil, hole, sand). Seven percent of the accidents occurred in wet roads and 8% in roads with irregular pavement. The horizontal and vertical signage was adequate in 93% of

Table 1. General description of circumstances surrounding included patients in this study.

		Motofreight worker		
		Yes (N=75)	**No (N=210)**	**Total (N=285)**
Age (years)*		29.0 (27.8 - 31.2)*	29.0 (28.7 - 31.0)*	29.0 (28.8 - 30.7)*
Workday (h/day)*		8.5 (8.3 - 9.7)*	———	———
Time of Motorcycle Usage (h/day)*		———	1.0 (1.9 - 2.5)*	———
Driving License**	No	17 (23%)	47 (22%)	64 (23%)
	Yes	58 (77%)	162 (77%)	220 (77%)
	NI	0 (0%)	1 (<1%)	1 (< 1%)
Defensive driving training**	No	46 (61%)	114 (54%)	160 (56%)
	Yes	18 (24%)	66 (31%)	84 (30%)
	NI	11 (15%)	30 (15%)	41 (14%)
Individual Safety equipment use**	B + H	6 (8%)	7 (3%)	13 (5%)
	B + J	1 (1%)	0 (0%)	1 (0.5%)
	B + H + J	10 (13%)	38 (18%)	48 (17%)
	H	37 (49%)	105 (50%)	142 (50%)
	NI	21 (29%)	60 (27%)	81 (28%)
Motorcycle Equipment**	A	16 (21%)	43 (21%)	59 (21%)
	F-LP	2 (3%)	4 (2%)	6 (2%)
	A +F-LP	9 (12%)	27 (13%)	36 (13%)
	NI	48 (64%)	136 (64%)	184 (64%)
Self-report Alcohol use**	No	71 (95%)	175 (83%)	246 (86%)
	Yes	3 (4%)	25 (12%)	28 (10%)
	NI	1 (1%)	10 (5%)	11 (4%)
Positive Test for Alcohol**	No	59 (79)	162 (77)	221 (78%)
	Yes	3 (4)	5 (2)	8 (3%)
	REF	13 (17%)	43 (21%)	56 (19%)
Drugs**	No	66 (88%)	185 (88%)	251 (88%)
	Yes	8 (11%)	17 (8%)	25 (9%)
	NI	1 (1%)	8 (4%)	9 (3%)

*: Median (95% Confidence Interval); **: Absolute and relative (percentage) data refer to the number of respondents (285), not to the total number of the sample (326). B: boot J: jacket; H: helmet; A: antenna; F-LP: forward-leg protection; REF: refused to take the breathalyzer test.

Table 2. Outcome of the biker's emergency care according the motorfreight, driver's license and defensive driving course.

	Discharge		**Inpatient admission**		**Transfers**	
	Motofreight worker		**Motofreight worker**		**Motofreight worker**	
	Yes	No	Yes	No	Yes	No
N	53	143	11	35	8	35
Age (years)*	28.0 (27.1 - 31.5)	29.0 (28.1 - 31.3)	29.0 (25.9 - 33.1)	27.5 (27.0 - 32.0)	21.5 (15.4 - 39.0)	30.0 (27.4 - 34.9)
Driving-license?	40 (89)	100 (88)	10 (67)	25 (69)	4 (67)	25 (92)
Defensive direction training?	13 (27)	43 (37)	1 (7)	10 (28)	4 (67)	10 (38)

*: Data mean median (IC95%) (IC95percentage).

Table 3. Type of injuries (diagnoses) according the occupation and the use of individual safety equipment.

		Motofreight worker		
		yes	No	Total
Helmet+Boots	Lower member fracture	2	1	3
	Upper member fracture	———	3	3
	Light injuries	3	2	5
	Polytrauma	1	———	1
Helmet+Boot+Jacket	Lower member fracture	1	5	6)
	Upper member fracture	2	4	6
	Light injuries	5	25	30
	Polytrauma	2	4	6
Helmet+Jacket	Lower member fracture	2	7	9
	Upper member fracture	———	6	6
	Light injuries	10	21	31
	Polytrauma	2	———	2
	TBI	———	3	3
	SCI	———	1	1
Boots+Jacket	Lower member fracture	1	———	1
Helmet only	Lower member fracture	8	19	27
	Upper member fracture	4	16	20
	Light injuries	18	48	66
	Polytrauma	———	2	2
	TBI	4	9	13
	Lower member fracture	3	4	7
Not recorded		7	30	37
total		75	210	285

Absolute and relative numbers (frequency in %) show the number of diagnosis, not the total number of subject in each group. The difference between the number of diagnoses and the total of the subjects represent non-recorded diagnoses. B: boot J: jacket; H: helmet. TBI: traumatic brain injury; SCI – spinal cord injury.

accidents that occurred outside of crossings, but it was inadequate in 18% of the accidents occurred at roads crossing.

Type, route and track profile. Sixty-two percent of victims reported accidents at average speeds for ordinary roads (40-60 km/hour) and for expressways (70-80 km/hour). Fifty-five percent took place in roads with two or more lanes and 76% with two or more tracks. Most accidents occurred outside crossings (72%), on straight stretches (70%) and on flat segments (75%).

Factors relating to the vehicle. Eighty percent of accidents were motorcycles up to 250 cc; the same proportion report periodic revisions, with 66% of revisions less than a year before the accident. Sixty-nine percent of the motorcycle fleet has less than six of age. Fifteen percent of the parts of the motorcycles were not original but were in good conditions (95%). Tires (11%) and brakes (7%) were the items with the worst conservation.

Expert analyses. Seventy-seven percent of accidents was related to human factors. Visibility accounted for 10%, road factors for 8%, other factors for 3% and vehicle for 1%. The main factors related to the motorcycle were imprudence (21%), lack of attention (17%), speeding (13%), inexperience (11%) and the motorcyclist vision (10%). The main factors related to the second vehicle were preference violations (42%), biker visibility (24%), lack of attention (8%) and recklessness (7%). The biker risk behavior and lack of respect and visibility of the second vehicle were the most important factors in the accident.

DISCUSSION

These results serve as a reference in identifying the main factors associated with traffic accidents with motorcycles, especially in developing countries. The use of motorcycles as transportation option in large urban centers

in Brazil grew rapidly, mainly because of the relatively low cost of the motorcycles, even when compared to public transport, apart from the comfort it provides: door to door transportation provided by an agile vehicle able to move quickly in very congested city traffic. The government agencies responsible for providing habilitation and urban mobility maintenance were not prepared for the motorcycle entering the traffic and the mobility system of the city. Motorcyclists unprepared to move in city traffic and car drivers and other vehicles unaccustomed to the presence of motorcycles on the road system without clear rules of movement, brought as a result many motorcycle accidents in urban areas. It is a global phenomenon that is occurring in many developing countries in Latin and North America[6,12] and in Ásia[11].

The motorcycle is an insecure vehicle[13] that demands greater care with driver training. The motorcyclist must acquire a defensive posture, but this precaution was not taken into account in most countries where the motorcycle entered as a huge transportation option. In this sample, the victims were predominantly male, young adults with low socioeconomic status (one to three minimum wages) and educational level corresponding to high school. They are similar to data reported by Rodrigues et al.[6] in their study covering several Latin American countries, where there is a prevalence of motorcycle as a transportation means without any kind of driver training. The occurrence of previous accident and greater number of serious injuries in victims who had no clearance were identified. The establishment of a defensive driving course was significantly associated with a reduction of 30% in motorcycle accidents in Thailand.[12]

In the present sample most, but not all, drivers wore helmet, a compulsory item under Brazilian traffic law; its absence is penalized with fines. Only one-fifth of motorcycle riders wore helmets, boots and jacket. Public policies that would make compulsory the use of safety equipment would certainly improve adhesion of motorcyclist's usage and could help in reducing the severity of injuries. Few motorcyclists use helmets in places where there are no coercive laws, a very common behavior in some American and Asian countries.[6,11,12] There is strong evidence to recommend the use of the helmet to prevent head traumas and deaths in motorcycle accidents, although few studies have evaluated quality and type of helmets.[15] The most prevalent injuries in this type of accident are lower limb fractures, a fact that was expected, on account of the large level of exposure of this part of body, coupled with a lack of adequate protection.

The use of alcohol and drugs was also found in 20% of the sample. The analysis shows that alcohol is an important causal factor that needs to be considered in public policies for prevention, as shown by a similar Canadian study.[14,16,17]

Many accidents occurred by side collision caused by the great number of motorcycles in the "corridor" between driving lanes. The "corridors" in fact a true virtual space, not well delimited and the lack of visibility reported by the driver of the second vehicle was one of the main factors related to the accident. However, accidents involving two vehicles where both had a responsibility for the accident were very common, showing behavioral issues and faults in the conductor's habilitation, but also in the lack of more severe coercive measures. The large number of side collision combined with the expert analysis (most of accidents occurred in straight road segments, not at crossings, with good weather conditions and visibility) point directly to the driver behavior, as the main accident factor, distinct from what was reported in a similar study done in Calgary, where climate and road conditions were the main causes.

The motorcycle use in professional activity (goods transport) is less related to the accidents than what happens to bikers who used the vehicle for transport. This is similar to what was reported by Angels,[18] who showed that "couriers" suffered fewer accidents than drivers who used the motorcycle as the transport vehicle. The time-on-the-bike seems to be less important than the quality of the direction, because motofreight workers are more exposed (in terms of time-on-the bike), but they also have more experience. Neither of the two groups regard security as an important factor in the use of the motorcycle. This type of ignorance is highlighted and can be additionally demonstrated by the low use of safety equipment, (except for the mandatory helmet), by the lack of taking defensive driving courses and by the high incidence of alcohol and drugs.

The massive insertion of the motorcycle in the chaotic traffic of the city of São Paulo in the last 15-20 years occurred haphazardly, without taking into account the need to better prepare the rider and the equal need to educate drivers of other vehicles about the fragility of the smaller vehicle. This is clearly shown from the analyzed factors, in terms of human factors and risk behaviors: speed, recklessness, alcohol and drugs and inadequate qualification, are prevalent in this type of accident. Prevention programs must take into account the educational and enforcement actions that have reduced the occurrences. The road condition is not the most important, but improvement of road conditions and signaling can also contribute to reduce accidents. Vehicle factors were less frequent, but the poor condition of tires and brakes were the most frequent and were directly related to the safety of the rider.

The effect of motorcycle accidents in the Brazilian public health systems are immense because more than half of the victims have serious injuries that require expensive and specialized care resources, which are infrequently available in all service units. The increased use of the São

Paulo University Medical College Hospital (HCFMUSP) emergency units highlights the seriousness of the situation. Less sophisticated emergency units are not equipped to evaluate and safely treat victims of motorcycle accidents.

The results of the current study show that there are several factors associated with motorcycle accidents and that there is a need for joint and coordinated actions that must be implemented if a significant reduction of accidents is to be expected. Rodrigues et al[6] showed that economic factors, low educational level and inefficient public policies to control the large number of circulating motorcycles are present in most of the countries assessed.

The major issues outlined in the introduction of the study were clarified by our results and need to be addressed in an organized and objective way. There is a need to create a common information system on traffic accidents that contains all relevant information for decision making and evaluation of results; this must be made available for research and studies. There is a need to improve urban mobility conditions of the city with reasonable alternatives to public transportation that must consider cost and quality. Individual transport, even on two wheels, is not the solution for big cities; on the contrary it does not improve congestion, pollution, space occupation and people's quality of life and it increases the number of severe accidents. Moreover, it is necessary to improve the qualification of drivers of all vehicles with emphasis on safety and sharing of routes. Enabling must be seen by the population as a necessity and an important part of the driver training process, demanding quality training and evaluation of the quality of drivers. There is a need for effective inspection of motorcyclists and motorcycles in terms of licensing, use of safety equipment and compliance with traffic rules. It is also important to expand the requirement for the use of boots and protectors of legs and arms; also vital is to effectively extend the control drug/alcohol usage by drivers; finally there is a need to improve the visibility of motorcyclists and motorcycle (equipment, clothing and accessories that increase the visibility of the motorcycle).

CONCLUSION

Data from this study allow us to conclude that the main factors associated with motorcycle accidents were insufficient or absent qualification, drug use, recklessness, speed and visibility, lack of security and defensive biker culture. In terms of the vehicles, background checks (tires and brakes); in terms of roads (surface and signaling at intersections).

AUTHOR PARTICIPATION

Greve, JMD – coordinator of the research; Resende, MR- coordinator of the research; Leyton, V, toxicologic analysis; Carvalho, HB, - statistical analysis; Andreuccetti, G - data collection;Bernini, C – ER director; Santos, JS – ER diretor

CONFLITC OF INTEREST

Authors declare no conflict of interest regarding this project

FATORES RELACIONADOS COM OS ACIDENTES DE MOTOCICLETA: ESTUDO EPIDEMIOLÓGICO

OBJETIVOS: Avaliar fatores associados com acidentes de trânsito com motocicletas.

MÉTODOS: Foram avaliadas 285 vítimas de acidente de motocicleta em São Paulo. Os dados foram coletados em plantões nas unidades de emergência. Foram coletadas informações sobre: condições das vítimas, uso de equipamentos de segurança, condições de estrada e veículo.

RESULTADOS: As vítimas eram principalmente homens jovens (92%); 23% usavam a motocicleta para o trabalho (média: 8 horas por dia); 45% possuíam a motocicleta por menos de dois anos; 77% tinham habilitação para dirigir; 33% tinham menos de quatro anos de habilitação; 31% tinham feito curso de direção defensiva. Lesões graves foram identificadas em 67% dos motoristas não habilitados. Houve politraumatismo em 9% das vítimas e traumatismo craniano em 5% da população avaliada. Fraturas de membros inferiores ocorreram mais frequentemente do em membros superiores (17% contra 12%). A maioria usava capacetes (90%), mas apenas 18% usava capacete, botas e jaqueta. Dosagens positivas de álcool (7%) e drogas (14%) foram vistas e totalizaram 21% de todas as vítimas. A maioria dos acidentes ocorreu como consequência de imprudência (88%), durante o dia (67%) e sem chuva (94%).

CONCLUSÃO: A maioria dos acidentes envolve vítimas do sexo masculino, adultos, que usam a motocicleta como meio de transporte e não consideram equipamentos de segurança, condução defensiva e o consumo de álcool e drogas fatores importantes para prevenção dos acidentes.

PALAVRAS-CHAVE: Acidente Trânsito; Epidemiologia; Motocicleta

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