Motor Bike Accident is a Main Cause of Maxillofacial Fractures Presenting to Cairo University Hospitals: A Retrospective Study

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ABSTRACT

Maxillofacial fractures are serious and frequent injuries, with costly management in terms of both time and money. Among the most important etiologies for maxillofacial injuries, Road Traffic Accidents stand out in many developing countries, including Egypt. Motor Bike Accidents present an important share in road traffic accident victims in general, and in Maxillofacial injuries in particular. The aim of the study was to evaluate impact of Motor Bike Accidents, as an etiology of maxillofacial trauma fractures. This is a cross sectional retrospective study of Maxillofacial fracture patients admitted Cairo University (Kasr Al-Aini) Emergency hospital over a one-year period. Data was collected on the nature of injuries, the etiology of trauma, and demographic criteria of patients. Total Maxillofacial fracture patients identified were 176 patients. The majority of patients were males, below 40 years. The most common etiology among them was Road Traffic Accidents, with the biggest share for 2-3 wheeled Motor Bike Accidents. The most frequently encountered fracture among motor bike riders was zygomatic fracture. Considering the big number of motor cycles registered in Egypt, their frequent involvement in road traffic accidents with grave injuries, and the disregard among their riders for the use of safety helmets, urgent steps need to be taken towards law legislation and development of community awreness about road safety for motor cycle riders.

Key words: *Maxillofacial, fracture, road traffic accident, motor bike accident*

INTRODUCTION

Maxilofacial fractures are serious and frequent injuries. They occur commonly in association with other grave injuries, but they may also occur as isolated lesions [1]. Such injuries need a well trained surgeon in a well equipped hospital. The high costs of their management impose an economic burden; and they may have long-term residual effects, impacting both cosmesis and function [2].

The incidence of such injuries and their etiologies, as well as the demographic pattern of their victims, differ from one country to another[3]. The leading causes worldwide are traffic accidents, assaults, falls, and sport injuries; however, geographic, cultural and economic factors will influence the etiologies in each country [4, 5].

Road Traffic Accidents (RTA) represent a major share of the overall trauma admissions. Whether Motor Car Accidents (MCA), Motor Bike Accidents (MBA), pedestrian casualties, or other forms of road acquired trauma involving a motorized vehicle, RTA pose a significant medical, economic and social burden [6-8].

Although studies may incriminate either inter-personal violence [5,9,10] or RTA[8,11-13] with the biggest share of maxillofacial injuries in developing countries, yet it's well agreed upon that MBA, offering no or little protection to their riders [11], represent a significant hazard on their own, with more numerous and more serious types of injury. This is especially true in developing countries, with inefficient road safety measures, and lacking traffic law legislation. [7, 11, 14-17]

Statistics from the World Health Organization (WHO), estimate that RTA worldwide result in about 1.25 million annual mortalities, and about 50 million sub-lethal injuries. [18, 19]

Of those mortalities, 23% are estimated to be the result of MBA. [18]

In Egypt, the estimated number of RTA victims annually, range from 6 thousand mortalities and 19 thousand injuries [20, 21], to almost double these numbers [22, 23]. And though only 1% of mortalities are the result of MBA [18, 19], yet some reports estimated that up to 19.9 % of the sub-lethal injuries resulted from MBA[21,24].

Aim of the study:

To evaluate the impact of Motor Bike Accidents, as an etiology of maxillofacial trauma fractures, in patients admitted to the Maxillofacial Subdivision in Cairo University (Kasr Al-Ainy) Emergency Hospital - Plastic Surgery department.

PATIENTS AND METHODS

A cross-sectional retrospective study was carried out on patients that presented to the Maxillofacial

Subdivision of the Cairo University (Kasr Al-Aini) Emergency Hospital – Plastic Surgery department, over the period of 1 year, from Febuary 1st 2016, to January 31st 2017.

Patients included in the study were those presenting with facial fractures, of the mandible, and/or the midface, as a result from a Road Traffic Accident (RTA), in which the patient was riding a motor bike. Motor Bike Accident (MBA) victims were included, wether they were riding a 2-wheeled or a 3-wheeled vehicle. Also patients with either isolated maxillofacial injuries, or multi-trauma patients were included in the study.

We excluded from the study patients with isolated dento-alveolar fractures, that were primarily treated by surgeons in the Faculty of Dentistry, Oral and Maxillofacial surgery emergency department. Also patients who acquired facial trauma with pure soft tissue injuries without fractures were not included in the study.

Patients from both genders, and from all age groups were included in the study.

Management of all the patients, at the emergency setting, was carried on according to ATLS principles. Primary and secondary surveys, and management of all emergency and/or life threatening conditions were done. Radiological studies in the form of CT face and panoramic-view x-ray were carried out for all patients. Patients' surgical management was carried out according to the AO foundation principles, using mandibular-maxillary fixation (MMF) and/or open reduction- internal fixation.

Demographic data was recorded for all patients, including age, gender, residence, occupation. We also documented the etiology of their trauma, the use of safety measures (putting seat belts in cars; wearing helmets for motor bike riders), the presence of other system injuries, the investigations done, the fractures each patient suffered, the method of surgical management, and the postoperative results, including any complications acquired.

RESULTS

The total number of maxillofacial fracture patients admitted to the plastic surgery emergency department during the study interval was 176 patients. 124 of these were the victims of road traffic accidents. 64 patients of which were riding motor bikes (2-wheeled or 3-wheeled vehicles) at the time they were injured.

During the same time interval other causes of maxillofacial fracture patients admitted included 22 drivers or passengers of a car or other non-motor-cycle vehicle (13.25%), 38 pedestrians involved in RTA (22.89%), 30 assault victims (18.07%), and 22 patients falling from a height (13.25%). Figure (1) presents the etiologic distribution of Cases included in the study.

RTA victims represented 74.70% of the total maxillofacial trauma patients. MBA maxillofacial fractures victims represented 51.61% RTA maxillofacial fractures victims, and 38.55% of total admitted maxillofacial fractures victims.

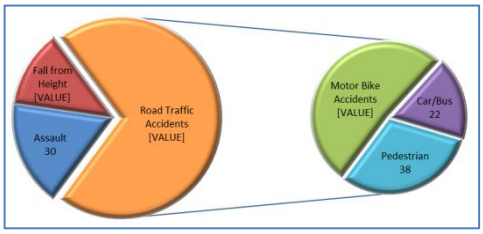

Figure 1: Etiologic distribution of Maxillofacial fracture cases included in the study.

Of MBA victims with maxillofacial fractures, 32 had mandibular fractures (19.28%), 12 had maxillary fractures (7.23%), 38 had zygomatic complex fractures (22.89%), 14 had orbital floor fractures (8.43%), 6 of which were isolated orbital floor fractures (blow-out). Figure (2) shows the frequency of different facial fracture sites among MBA accident victims, in our study population.

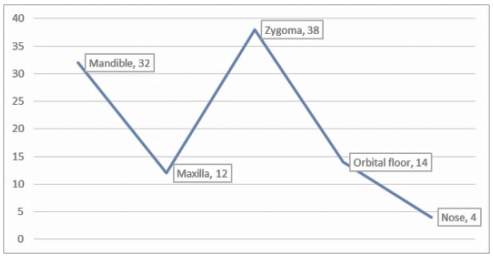

Figure 2: Frequency of different facial fracture sites among MBA accident victims.

The age of MBA maxillofacial victims ranged between 8 – 55 years (mean age= 23.62 years). 26 (40.63%) were below 21 years old, 32 (50.00%) aged 21-40, 6 (9.37%) aged 41-60, and none (0%) were above 60. 62 patients were males (96.88%), and only 2 were females (3.12%). Table (1) shows the age and gender distribution of patients included in the study.

Table 1: Age and gender distribution of patients included in the study.

	<21 years	**21-40 years**	**41-60 years**	**>60 years**	***Total***
Male	26	30	6	0	62
Female	0	2	0	0	2
Total	26	32	6	0	64

The duration of in-hospital treatment of the patients included in the study ranged between 7 – 36 days, (mean= 22.5 days). The expense of the hardware used during the surgery per patient ranged between EGP 900 – 6500, (mean= EGP 2900).

2 of motor bike riders (3.12%) were wearing helmets at the time of the accident, of which none (0%) were standardized helmets that followed skull and face protective criteria. None of the 3-wheeled motor bike riders (0%) were putting seat belts on at the time of the accident.

Two of the patients were complicated by superficial wound infection; they were managed with antibiotics and frequent wound dressing, and responded well to treatment. One patient suffered a deep infection with abscess formation beneath the gingiva, the abscess was drained and the patient received antibiotics according to culture and sensitivity, the patient healed with some gingival scarring, but we did not need to remove the plates and screws. Total cases of infection = 3 (4.69%). Two patients had plate related complications (visible/palpable but unexposed plates), the troublesome plates were removed after the complete healing of the fractures; 2 cases (3.12%).

DISCUSSION

Maxillofacial fractures are serious injuries, with vast impact on the function, cosmesis and psyche of the patient [1, 12]. Its frequency and socio-economic influence justifies an in-depth study onto its causes and consequences.

In our study, 74.70% of total maxillofacial cases admitted were due to some form of an RTA. This complies with other studies carried out in Egypt estimating RTA to cause 40.9% [4] and 78% [9] of maxillofacial fractures. It also complies with the trend perceiving RTA to be the leading etiology of maxillofacial injuries in the developing countries. This is explained by the less safe roads, less safe vehicles, less safe driving behavior and less strict traffic and road safety law legislation [8, 11-13].

Among our study population, MBA caused 51.61% of maxillofacial fractures after RTA, and 38.55% of total admitted maxillofacial fractures during the same period. This corresponds well with the literature identifying MBA as a serious cause of maxillofacial and other associated injuries. Motorcycle offers minimal protection, and ready exposure of the rider's body, head and face during an accident, leading to higher rate of bone fractures [11, 25].

The problem with MBA is more serious in developing countries, where the socio-economic factors and traffic congestion offers motorcycles as an alternative to other means of transportation, and the less strict safety laws and less strict drivers medical and drug testing present a grave problem [7, 12]. It is worth noting that Egypt has 2.6 million registered motorcycles, representing 30.6% of total registered vehicles [26, 27].

There was a clear predilection for males among victims presenting with maxillofacial fractures, and this is even more evident among victims of MBA. Males constituted 96.88% of maxillofacial fracture victims following MBA in this study. This is higher than reviewed studies in the literature [4, 7, 8, 11]. This reflects the social situation in Egypt where most motorcycle riders are males, either using the bikes to commute or working as delivery personnel.

Young adults and adults constituted the majority of maxillofacial fracture victims due to MBA, with mean age of 23.62 years. 50 % of cases were 21 – 40 years old, and 40.63% were below 21 years old. This reflects the social situation in Egypt, where many of the motorcycle riders are young aduts and even children.

With an average in-hospital treatment period of 22.5 days, and an average cost of EGP 2900 per case (only for plates and screws used in ORIF), the results highlight more the financial/social impact of those injuries.

The shown age and gender predilection, with the most affected population being the young adult and adult males, with the most capacity of work and production, that constitute the main work-force to any economy; together with the long sick-leaves, and costly treatment expenses. Our results should ring a bell, as they delineate the big impact of maxillofacial trauma, especially that follows MBA accidents, on the country's economy.

The study showed that a very scanty percentage of MBA victims were putting on safety helmets at the time of accident, none of which were accredited helmets following proper safety standards. And none of the 3-wheeled vehicles Accident victims had a

safety belt installed within their vehicles. This rings an alarm too, stressing on the importance of law legislation implementing the use of safety measures for motorcycle riders.

Thousands die, and thousands get injured every year as a result of RTA in Egypt [20-22]. MBA is responsible of a big share of these injuries [24]. A nation-wide study is needed to get a more accurate estimate of the national impact of motorcycle accidents, contributing to maxillofacial fractures in particular, and to over-all trauma morbidities and mortalities. This will help identify the need for law modification, aiming at keeping this risk factor to a minimum.

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