



## REVIEWARTICLE

### MAXILLOFACIAL INJURIES AND THEIR PATTERN RESULTING FROM ROAD TRAFFIC ACCIDENTS- A THREE AND A HALF YEARS STUDY IN THE DEPARTMENT OF DENTISTRY, JHALAWAR MEDICAL COLLEGE FROM 1ST JANUARY 2009 TO 31ST DECEMBER 2013

<sup>1,\*</sup>Dr. Sajid Khan and <sup>2</sup>Dr. Aparna R Betharia

<sup>1</sup>Professor Department, of Dentistry, Jhalawar Medical College, Jhalawar

<sup>2</sup>Professor and Head, Department of dentistry, Jhalawar Medical College, Jhalawar

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#### ABSTRACT

Maxillofacial injuries are one of the byproducts of 'SPEED ON ROADS'. Despite of employing numerous devices for improving safety measures in motor vehicles, traffic accidents are still among the main reasons of maxillofacial injuries. Notwithstanding, the recent advances in our field, maxillofacial injuries still remain the serious clinical problem due to specificity of this anatomical region. Knowledge of mechanisms of injuries can be helpful in satisfactory trauma prevention. The aim of this study was to find out the incidences and pattern of maxillofacial injuries resulting from road traffic accidents in patients treated in the Department of Dentistry, Jhalawar Medical College from 1st January 2009 to 31st December 2013.

#### INTRODUCTION

Previous research works indicate traffic accidents as the main etiological factor of maxillofacial injuries around 34-42% to 90.15% (Haug, 2000; Aksoy *et al.*, 2002; Wood, 2001). Assaults (Aksoy *et al.*, 2002) and sports injuries are next in the lead (Gassner *et al.*, 1999). But these etiological factors not only vary from country to country, but also in various regions of the same country depending on the prevailing socio-economical, cultural and environmental factors. Periodic verification of the etiology of maxillofacial injuries helps to recommend ways in which maxillofacial injuries can be averted (Adeyemo *et al.*, 2005). Anatomical specifications of this region make maxillofacial injuries as serious clinical problem. This area harbors important organs and also is the starting point of digestive and respiratory systems. Hence, injuries in these vital areas leads to serious dysfunctions. Due to an anatomical proximities, together with maxillofacial injuries, the damages to the central nervous system often occur (Klotch, 2000). No enough emphasis can be laid on the esthetic trauma caused by maxillofacial injuries (Hull *et al.*, 2003). All these aspects force us to focus special attention on the etiological factors and the trauma mechanisms to successfully prevent these injuries. One of the methods of trauma prevention among the users of motor vehicles in the most countries of the world is the obligatory fastening of requirement, 25% decrease in frequency of injury occurrence among the car users was observed (Henderson, 1973).

The severity of injuries was significantly lower among the seat belt fastened in the moment of accident comparing to those who had not (Nakhgevary, 1994). The employment of air-bag systems also decreases the incidence of maxillofacial injuries in motor vehicle user subjected to traffic accidents, too. It is a fact worth emphasising that over half of patients who suffered facial traumas as a result of traffic accidents, were after use of alcohol or stupefacient (Hutchison *et al.*, 1998).

#### AIMS AND OBJECTIVES

The aim of this study was to determine the incidence of maxillofacial injuries treated in the Department of Dentistry, Jhalawar Medical College, Jhalawar from 1st January 2009 to 31st December 2013 along with incidence and pattern of maxillofacial injuries from traffic accidents.

#### MATERIALS AND METHODS

The material consisted of total number of 670 maxillofacial injuries patients treated in the Department of Dentistry, Jhalawar Medical College Jhalawar from 1st January 2009 to 31<sup>st</sup> December 2013. A total of 670 maxillofacial injuries patients case records, admitted during this period was included as study material. The required consent to use the data was taken at the time of admission. Jhalawar is situated in Rajasthan state of India. It is an highly urbanized and industrialized region of Rajasthan. The detailed analysis was carried out on the case records of 670 patients with maxillofacial injuries resulting from traffic accidents. On the basis of history, examinations on admission, consultations and radiological examinations patients, age and gender, we

#### Corresponding author: Dr. Sajid Khan

<sup>1</sup>Professor Department, of Dentistry, Jhalawar Medical College, Jhalawar

obtained information on the pattern of injury and detailed description of accident.(the data concerning the role of the patient in the accident was also collected).Patients included in the research (379 males and 291 females)were between 3 to 72 years of age.The injuries which the patients suffered were grouped into soft tissue injuries, injuries of teeth and alveolar process, nasal injuries, mandibular fractures, orbital "blow-out"fractures, zygomatic complex fractures and multiple fractures of the facial bone frame (Piotr Malara, ?). Both single and multiple fractures of the mandible were included into mandibular fractures. All the fractures of maxilla according to the Le Fort's classification, both unilateral and bilateral were included into the group of maxillary fractures.The injuries which were the combination of the fractures listed above, were classified into the group of multiple fractures of facial bone frame.

The patients were grouped into 6 age categories from 3-7,8-17,18-25, 26-40,41-55 and from 56-72. (Wood, 2001). (In case of smaller number of observations disabling the correct statistical testing, the age categories were joined together Concerning their role in the accident, the patients were grouped as drivers, passengers, pedestrians, cyclists and motor cyclists. The accidents were grouped into four categories (viz: summer, winter, spring and autumn) depending on the season of the year and into six 4- hour periods (0-4,4-8,8-12,12-16,16-20 and 20-24). Upon the time of the day in which they had occurred (Piotr Malara, ?). The statistical analysis was done using statistica.V.5.1. The statistical significance of differences in the numbers of observations (expressed proportionally) between the groups was checked by chi-square test on the p-level 1,0.05.

**RESULTS**

There were 670 patients with injuries to soft tissues and fractures of facial bone frame treated in Department of Dentistry, Jhalawar Medical College, Jhalawar, Rajasthan, India, from 1<sup>st</sup> January 2009 to 31st December 2013. Amongst these, 297cases (44.32%) resulted from traffic accidents. There were 379 men (56.56%) and remaining 291(43.44%) were women in the age of 3 to 72 years. The other causes of maxillofacial injuries included assaults and interpersonal violence170 (25.37%), falls 113 (16.86%), sports injuries 80 (11.94%) and others. The statistics of patients with particular types of injuries resulting from road traffic accidents are elaborated in Table 1 and Table 2 features age and sex distribution of patients in road accidents. Emphasis is laid on the fact that all injuries were more common in males than women.

**Table 1. Distribution of particular types of maxillofacial injuries resulting from traffic accidents**

Type of injury	No %
Soft tissue injury of face	172(25.67%)
Alveolar process injuries	170(25.37%)
Mandibular fractures	165(24.62%)
Unilateral multiple fractures	92
Bilateral multiple fractures	73

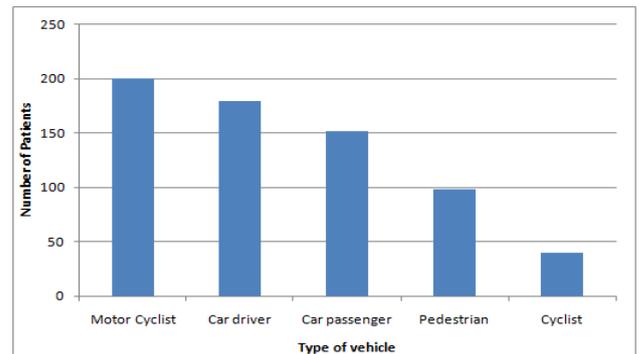
In cases of road accidents; the difference between the proportions of men and women are statistically significant on the p-level<0.05. 172 (25.67%) patients suffered soft tissue injuries of the face, followed by170 (25.37%) with alveolar process injuries and 165 (24.62%) mandibular fractures.

**Table 2. Age and sex distribution of patients**

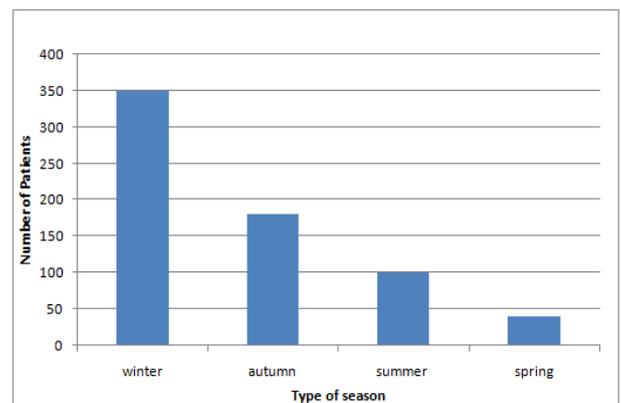
Age (years)	Male	Female	No.	%
3-7 years	10	9	19	2.83%
8-17 years	80	53	133	19.8%
18-25 years	104	93	197	29.40%
26-40 years	96	66	162	24.17%
41-55 years	49	48	97	14.47%
56-72 years	40	22	62	9.25%
Total	379	291	670	100%

Among mandibular fractures which were observed in 165 patients of all mandibular fracture 92 number of patients suffered from unilateral multiple fractures(55.75% of totalmandibular fractures),whereas rest were bilateral 73 in number (44.24%). The other type of injuries were less frequent.

Statistics of patients with maxillofacial injuries resulting from traffic accidents in reference to their age are shown in Table 2. For both men and women, the injuries were the most frequent in the age of 18-25 years (133,29.40%) and least in the age group of 3-7 years (19,2.83%)and then in 56-72 years (62,9.25%). In all the age groups the differencesin the proportion between men and women were statistically significant on the p-level <0.05. The number of patients resulting from maxillofacial injuries resulting from traffic accidents in reference to their role in the accidents.



**Figure 1. No. of patients v/s Type of vehicle**



**Figure 2. No. of patients v/s Type of season**

Majority of patients were motorcyclists (200, 29.85%) followed by car drivers (180, 26.86%) and then by car passengers (152, 22.68%), pedestrian (98, 14.62%) and cyclists. (40,5.9).

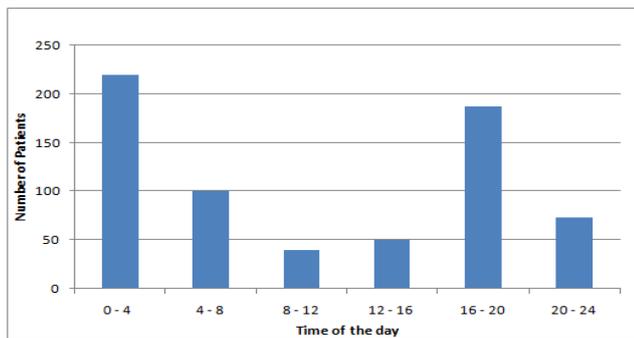


Figure 3. Of patients v/s time of the day

The statistics of patients with the maxillofacial injuries depending on the season of the year in which the accident occurred are shown in Figure 2. This analysis revealed that the most accident took place in winter season (350, 52.23%) and least in spring season (40, 5.9%). There were 180 patients (26.86%) injuries in summer and 100 patients (14.92%) in autumn. The analysis of the data on patients who suffered from maxillofacial injuries resulting from road traffic accidents in reference to time of the day as shown in figure 3 revealed that most of the accidents occurred between midnight and 4a.m. (220, 32.82%). The least patients were injured between 8-12 am (40, 5.9%).

## DISCUSSION

Traffic accidents leading to maxillofacial injuries are a common entity in our region despite all the safety measures and safety improving devices in motor vehicles (Nakhgevan, 1994; Bataineh, 1998). In our study, 44.32% of all the patients treated in department of dentistry, at Jhalawar medical college were maxillofacial injuries caused by traffic accidents, it is proportional to the other studies by different authors (Haug, 2000; Aksoy, 2002; Wood, 2001). Such a succession of etiologic factors is in accordance with the data from most developed countries (King *et al.*, 2004; Laski *et al.*, 2004). But emphasis also should be laid on that data from our department of dentistry, do not reflect quite precisely the incidence of maxillofacial injuries for the actual fact that some patients with maxillofacial injuries concomitant with severe injuries of the other body regions are admitted to neurosurgical, casualty, orthopedic, ENT and other words (Rosman, 1994). More over, there may be no need to treat the patients with minor maxillofacial injuries in the specialized departments.

Our study reveals that the most common are the injuries to soft tissues followed by tooth and alveolar process injuries and mandibular fractures (Table 1). Results from Queensland (Australia) from the years (1994-1997) show that the tooth and alveolar process injuries followed by zygomatic complex fractures were the most common maxillofacial injuries resulting from road traffic accidents (Wood, 2001). Little is said about the problem of maxillofacial injuries in reference to the particular groups of motor vehicle users (drivers, passengers, cyclists, etc.) also it has been proved time again that men are more frequently subjected to maxillofacial injuries (Wood, 2001). Our results demonstrate that the maxillofacial injuries, (as in accordance with other authors findings (Hutchison *et al.*, 1998; Ryan *et al.*, 1998) resulting from road traffic accidents are most common in 18-27 age group.

It probably reflects in-experience and driving with dash in that age group. It is worth emphasizing that the highest incidence of maxillofacial injuries resulting from traffic accidents was noted in spring, when the improvement of road conditions encourages speedy driving. Lowest, number of injuries was found in winters, when the collisions causing only minor injuries are more common roads. This result is in accordance with research of Wood and Freer (Wood, 2001). These authors also found that the incidence of maxillofacial injuries is highest at the afternoon rush hours, from 3pm to 4pm., when the intensity of traffic is highest. These results support the findings of the other authors that most of the traffic accidents occur at daytime, when the atmospheric conditions are relatively good (Hull *et al.*, 2003).

## Conclusion

Our results exhibit that road traffic accidents remain amongst the main etiological factors, followed by assault and interpersonal violence, sporting injuries and falls. This succession of etiologic factors is in accordance with the data from the most developed countries. The most frequently occurring maxillofacial injuries resulting from traffic accidents include injuries to facial soft tissues, injuries to teeth and alveolar process and mandibular fractures. Maxillofacial injuries resulting from road traffic accidents are male biased with special affinity in age group of 18-27 years. And particularly high incidence noted in winters. It also goes along well with the midnight rush hour i.e. From 0-4am. The relative high incidence of maxillofacial injuries due to road traffic accidents indicates the necessity to reinforce laws and regulations aimed to prevent road traffic crashes and thus to reduce maxillofacial injuries among children and adults.

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