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Pattern and Risk Factor Analysis of Oral and Maxillofacial Trauma- A Hospital Based Study

Parveen Akhtar Lone[1], Jasbinder Kumar[2]*, C. Lalmuanpuia[3]

[1]Professor & HOD in the Department of Oral and Maxillofacial Surgery, Indira Gandhi Govt. Dental College, Jammu (J&K), India.
Email: parveen.lone@yahoo.com,
Orcid ID: 0000-0003-2823-1057
*[2]Registrar & MDS in the Department of Oral and Maxillofacial Surgery, Indira Gandhi Govt. Dental College, Jammu (J&K), India.
Email: jasbinderk068@gmail.com,
Orcid ID: 0000-0002-6210-2825
[3]Post graduate & BDS in Department of Oral and Maxillofacial Surgery, Indira Gandhi Govt. Dental College, Jammu (J&K), India.
Email: muanpuia654@gmail.com,
Orcid ID: 0009-0004-1013-777X

*Corresponding Author

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Abstract

Background: The purpose of the study is to discuss the epidemiology and pattern of oral and maxillofacial trauma and various risk factors related to them. **Material & Methods:** This retrospective study was conducted in the department of Oral and maxillofacial surgery, Indira Gandhi Govt. Dental College, Jammu between 1st January to 31st December 2023 for a period of one year. Standardized data was gathered related the following information: Gender, age, etiology of injury, anatomic site of trauma , presence and location of associated injuries, treatment pattern and complications. Following categories of injury cause were considered- RTA, Fall from height, Personal violence, Animal attack injury. **Results:** During the one year period of study, 600 patients presented with oral and maxillofacial fractures. Road traffic Accident was the most common cause of injury comprises 487 (81.2%) injuries. The next common cause was assault n=61 (10.2%) followed by fall from height n=45 (7.5%). The most common site of maxillofacial fracture was mandible n= 373(62.2%). The next common site of maxillofacial trauma was Zygomatic arch n=94(15.7%). The next common site of maxillofacial fracture was Maxilla n=60(10%) followed by dentoalveolar 49(8.2%). **Conclusions:** Road traffic accident remain the highest cause of injury. Precaution and preventive measures need to be reinforced, considering the quality of life, disability and cost of rehabilitation.

Keywords:- Maxillofacial trauma, epidemiology of maxillofacial trauma.

INTRODUCTION

WHO defined accident as an unplanned result in recognizable damage. Another definition of accident is 'sequence of events occur which produces injury or property damage'.[1]

Maxillofacial injuries have been seen in 5-33% of patients with severe trauma. It can be isolated or in association with other injuries. Injuries to the maxillofacial region may be disabling. It is the region of special functions such as vision, hearing, olfactory, respiration, mastication and speech. Important vascular and neural structures are also present in this region. Facial deformity caused by trauma and post surgical sequelae produces negative impact on perception socially and therefore

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psychological impact increase the level of resulting morbidity.[2]

There is a correlation between facial fractures and cranial injuries. About 20% patients of maxillofacial injuries have associated cranial injury. Knowledge about these injuries provides useful strategies and multidisciplinary approach to patient care. Historically middle third facial skeleton was considered as a cushion to the neurocranium and thus protect from severe trauma. But some evidences suggested that middle third facial skeleton actually transmit direct force to the neurocranium through the buttresses as a result there is more neurological injuries with lower GCS score and therefore increase mortality.[3]

Investigations have shown that impact to middle third face causes disruption of anterior and middle cranial fossa and duramater and thus brain injury. The same relationship does not exist for mandibular fracture.[3]

Road traffic accident may become the 7th leading cause of death by 2030 if not intervene.[1] Over the last decade, the philosophy of life has changed toward esthetic appearance. It is necessary to establish data on maxillofacial trauma so as to implement different preventive measure. Therefore an understanding of the etiology with epidemiological characterstics, treatment pattern, associated injuries over a period of 1 year can help in providing clinical and research priorities for effective treatment and improve the quality of life.[4]

MATERIAL AND METHODS

The permission and protocol for the study were obtained from the Institution Ethics Committee. This retrospective study was conducted in the department of Oral and maxillofacial surgery , Indira Gandhi Govt. Dental College, Jammu between 1st January to 31st December 2023 for a period of one year. The present study included OPD as well as admitted patients. The victims were interviewed bedside. In case patient is not in a condition to give history, their relative or attendants were interviewed. Prior to the interview, informed consent were taken from each participant and confidentiality of the information collected were ensured. Standardized data was gathered related the following information:

Gender, age, etiology of injury, anatomic site of trauma , presence and location of associated injuries, treatment pattern and complications.

Fractures were diagnosed with radiological examinations.

Following categories of injury cause were considered-

- RTA
- Fall from height
- Hit by object
- Blunt force injury
- Animal attack injury
- Personal violence.

Statistical Methods: The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were

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expressed as Mean±SD. Student's independent t-test or Mann-Whitney U-test, whichever feasible, was employed for comparing continuous variables. A P-value of less than 0.05 was considered statistically significant.

Inclusion criteria

- Patient who gave informed consent.
- Patient with hard and soft tissue maxillofacial injuries.

Exclusion criteria

- Patient who refused informed consent.
- Patient who had craniocerebral injuries without maxillofacial injuries.
- Patient who suffered from burns and toxicities.
- Patient who were brought to hospital dead.

RESULTS

During the one year period of study, 600 patients presented with oral and maxillofacial fractures. The age of the patients ranged from 17-76 years, with mean age 34.9+_14 and peak age incidence in third and fourth decade. [Table 1, Figure 1]

This consisted of 478 males and 122 females giving male and female ratio of 3.9:1 with male dominance in all age groups. [Table 2, Figure 2]

Road traffic Accident was the most common cause of injury comprises 487 (81.2%) injuries. The next common cause was assault n=61 (10.2%) followed by fall from height n=45 (7.5%). The least common cause was animal attack n= 7(1.2%).[Table 3, Figure 3].

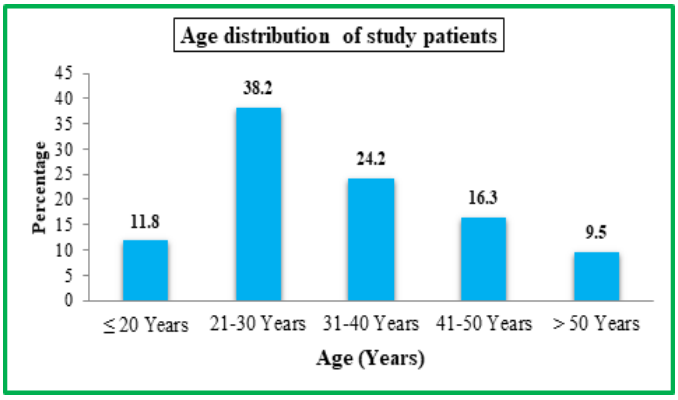

Figure 1: Age distribution of study patients

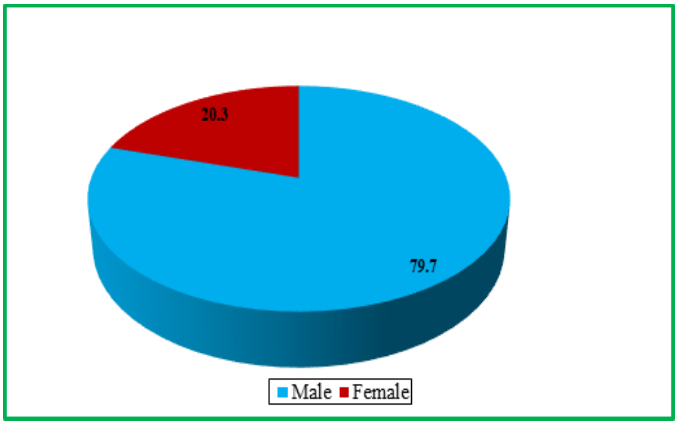

Figure 2: Gender distribution of study patients

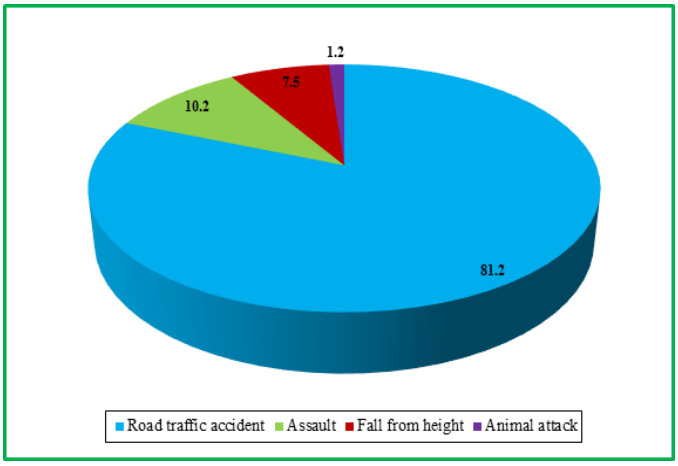

Figure 3: Etiology of fracture among study patients

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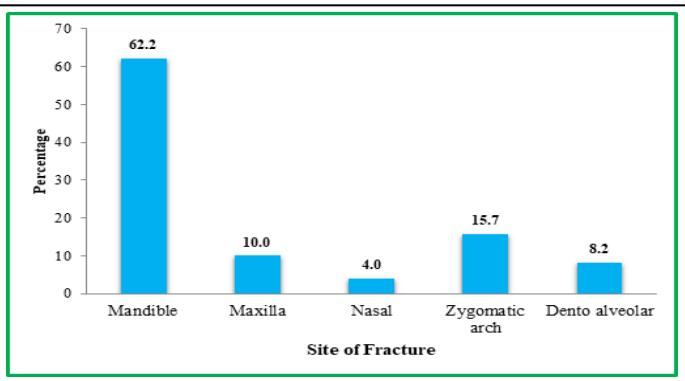

Figure 4: Distribution of study patients as per site of fracture

The most common site of maxillofacial fracture was mandible n= 373(62.2%). The next common site of maxillofacial trauma was Zygomatic arch n=94(15.7%). The next common site of maxillofacial fracture was Maxilla n=60(10%) followed by dentoalveolar 49(8.2%). The least common site of maxillofacial trauma was nasal fracture n = 24(4%). [Table 4, Figure 4]

Table 1: Age distribution of study patients

Age (Years)	Number	Percentage
≤ 20 Years	71	11.8
21-30 Years	229	38.2
31-40 Years	145	24.2
41-50 Years	98	16.3
> 50 Years	57	9.5
Total	600	100
Mean±SD (Range)=34.9±14.53 (17-76 Years)		

Table 2: Gender distribution of study patients

Gender	Number	Percentage
Male	478	79.7
Female	122	20.3
Total	600	100

Table 3: Etiology of fracture among study patients

Etiology	Number	Percentage
Road traffic accident	487	81.2
Assault	61	10.2
Fall from height	45	7.5
Animal attack	7	1.2
Total	600	100

Table 4: Distribution of study patients as per site of fracture

Site of fracture	Number	Percentage
Mandible	373	62.2
Maxilla	60	10.0

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Nasal	24	4.0
Zygomatic arch	94	15.7
Dento alveolar	49	8.2
Total	600	100

DISCUSSION

During the one year period of study, 600 patients presented with oral and maxillofacial fractures. This consisted of 478 males and 122 females giving male and female ratio of 3.9:1 with male dominance in all age groups [Table 2, Figure 2]. Majority were males accounting for 79.6%. It was higher incidence rate comparing to several literature, reporting the epidemiological data.[5,6]

The most common cause of maxillofacial trauma was RTA (81.2%) [Table 3, Figure 3]. Similar results were seen in other studies.[7,8] Drivers comprised the largest single group followed by pedestrian and thereafter passengers. Children are more predisposed to pedestrian crashes due to their inability to make complex judgement of distance and speed and poor directional hearing.[9] The next common cause was assault (10.2%) followed by fall (7.5%). The trend has changed in developed countries where a drop in RTA and increase in assault has been seen as a cause of maxillofacial fractures.[10,11] Domestic violence has been identified as another common cause of assault in women. The literature reported 36-95% of battered women suffer injuries to face, head and neck.[12] Falls have also been identified as an important etiology in both young and elderly. Large proportion of injuries due to fall from a low height occurred in elderly population. Most fall occur during daily activities and at home. Some patients presented to hospital with a history of fall from trees in rural areas. Small proportion of maxillofacial fracture were due to animal attack (1.2%) such as bear maul and horse related injuries.

Mandibular fractures accounted for 62.2% of all maxillofacial fracture [Table 4, Figure 4]. The most common fracture region in the mandible was symphysis / parasymphysis, which is also seen in other studies.[13] The high incidence of mandibular fracture reported in the study may be due to presentation of some isolated mandibular fracture to our dental college that were referred from other tertiary hospitals. The next common site of maxillofacial fracture was Zygomatic arch (15.7%). The prominence of the zygoma and its multiple articulations on the middle facial skeleton increased its vulnerability to fracture following trauma. The next common site of maxillofacial fracture was maxilla (10%) which may be unilateral or bilateral followed by Dentoalveolar fracture (8.2%). A significant association between seat belt use and incidence of middle third fracture was seen.[14] Delayed treatment was associated with increase chances of malocclusion.[15] The least common site of maxillofacial fracture was nasal (4%). The lower incidence of fracture reported in this study may be due to non presentation of some isolated nasal fracture to our dental college.

PA view, SMV,PNS view of skull and OPG were the frequently used imaging technique. Although CT is currently the Gold standard for

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imaging technique, but it was limited to the patients who had mild craniocerebral injuries.

Maxillofacial fractures were treated conservatively and surgically (using Closed Reduction and Open Reduction Internal Fixation) respectively.

CONCLUSIONS

Road traffic accident remain the highest cause of injury. Large proportion had occurred in young person mostly in third and fourth decade of life. Precaution and preventive measures need to be reinforced, considering the quality of life, disability and cost of rehabilitation. More studies should be conducted to assess the physical, social and psychological quality of life for patients affected with maxillofacial trauma. Public need to be educated about alcohol consumption and its impact while driving and advantage of using seat belt and helmets.

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