

## ORIGINAL RESEARCH

# Retrospective Analyses of Orofacial Traumatic Injuries in Trauma Patients, Registered as Medicolegal Cases at a Tertiary Care Hospital in Delhi

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## ABSTRACT

**Aim:** The purpose of this retrospective study was to determine the etiology, occurrence and the pattern of orofacial traumatic injuries in trauma patients, registered as medicolegal cases, managed by the Dental Unit of the Accident and Emergency Department at the UCMS and GTB Hospital, Delhi.

**Materials and methods:** Dental case record of 1289 medico-legal patients (from January 2011 to December 2011) reported to UCMS and GTB Hospital Emergency, Delhi were analyzed. The age, gender, month, etiology and type of injury were the different variables that were recorded.

**Results:** Orofacial trauma was more common in males (1052, 81.52%) compared to females (237, 18.75%). Male to female ratio was (4.438:1). The main etiologic factor involved in orofacial trauma was physical assault (54.29%) and road traffic accident (34.52%). Age distribution peak was observed in 21 to 25 age group (19.68%). The prevalence of trauma through out year showed proportionality, being observed a larger of cases between month April and June.

**Conclusion:** Based on the obtained data it may be concluded that appropriate policies of orofacial trauma prevention must be established. Strict legislation against violence and stricter implementation of traffic rules must be followed.

**Keywords:** Maxillofacial trauma, Retrospective analysis, Medico-legal case.

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## INTRODUCTION

Orofacial trauma is a common presentation in Accident and Emergency Department of Medical Hospitals either as an

isolated injury or as a part of multiple injuries to head, neck, chest and abdomen. Orofacial injury in trauma patient registered as medicolegal case can happen in many situations. The increase of violence, traffic accidents and engagement in physical activities have contributed to transform orofacial injury in an emergent public health problem.<sup>1,2</sup> Due to very high prevalence, orofacial injury account for a high percentage of complains in emergency dental services.<sup>3,4</sup>

Orofacial injuries have a strong impact on life quality, because they cause physical and emotional distress and may have a high negative interference on the social relationship. This study investigated the type and pattern of injury in pediatric, adolescent and adult dental patient attending the hospital emergency services and registered as medicolegal cases.

## MATERIALS AND METHODS

This study was conducted in Department of Dentistry in UCMS and GTB Hospital, India. The hospital is main tertiary care hospital in East Delhi, and caters to all kind of referred emergency cases. Following due clearance from a departmentally instituted ethical committee data was recorded from medico legal case (MLC) records maintained in the Department from January 2011 to December 2011. Cases with incomplete documentation were excluded. The following information was collected from each patient file available in department records, age at the time of injury, gender and pattern of orofacial injury. Etiology was classified mainly as four categories for MLC: (1) Road traffic accident, (2) physical assault, (3) fall (4), others. Others category includes fall from train, gunshot injury etc. The data obtained were statistically analyzed and data were interpreted using percentage wherever necessary.

## RESULTS

A total of 1,289 patient aged 0 to 65 years met the inclusion criteria and were enrolled in the study. When the etiology of orofacial injury was analyzed, 54.29% orofacial injury was caused by physical assault, 34.52% caused by RTA, 8.06% by fall, 3.13% by other reasons.

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Analysis of age relative to etiologic factor revealed that among patients aged 0 to 5 years, fall was the most prevalent cause of dentoalveolar trauma. Physical assault and traffic accidents were most frequent cause in 21 to 25 year age group old participant (19.68%) followed by 26 to 30 year age group (13.71%). A decreasing trend was seen with age proceeding to both the extremes (Table 1).

The distribution of patients by gender showed that males (1052, 81.52%) were more often affected than females (237, 18.75%). The male to female ratio was (4.4:1). Physical assault is most common etiology in both the males and females followed by RTA (Table 2).

The prevalence of trauma throughout year showed proportionality, being observed a larger of cases between month April and June (28.98%) followed by January to March (24.26%). The main etiology was physical assault followed by RTA throughout year (Table 3).

From a total of 1289 patients, 624 (48.40%) patients had luxation injury, out of which 105 (8.15%) patients reported with avulsed teeth, 137 (10.62%) patients had dental hard tissue injury, the incidence of soft tissue injury was considerably high 480 (37.23%) patient had soft tissue injury, 48 (3.73%) patients had bony injury (Table 4). Mandibular fracture was the most common finding followed by alveolar fracture (Table 5).

## DISCUSSION

Orofacial injury account for a high percentage of complaint in Accident and Emergency Department of Medical Hospital. Orofacial damage occurs in violence related and accident related event in India are discussed in present study. In India, criminal prosecution requires a previous medico-legal assessment of the victim. In this study, retrospective evaluation of all medicolegal report concerned orofacial trauma were analyzed. The analyzes were based on verification of clinical records of patients reported with orofacial injury in Accident and Emergency Department of Tertiary Care Hospital (UCMS and GTB Hospital) of East Delhi during January 2011 to December 2011. The population treated in this service lives in a sector of city with low socioeconomic level.

This study found orofacial injury to be more prevalent in males. The male to female ratio was 4.4:1 however, higher than what has been reported by Ugboke et al<sup>5</sup> Jerius,<sup>6</sup> and El-Sheikh et al.<sup>7</sup> Males are the main victim of orofacial injury, because they are more frequently engaged in stronger physical activities like fights, rash driving and outdoor sports. Other studies have demonstrated almost the same incidence of orofacial injury in male and female.<sup>3,8-18</sup>

Most of the male patient in this study were in the young adult (age group of 21-25 year), who are often injured due

**Table 1:** Distribution of patients in relation to age according to etiology of orofacial injury

Age (n = 1289)	Road traffic accident	Physical assault	Fall	Others
0 - 5	9 (0.69)	4 (0.31)	12 (0.93)	2 (0.15)
6 - 10	20 (1.55)	7 (0.54)	9 (0.69)	3 (0.23)
11 - 15	39 (3.02)	31 (2.40)	13 (1.00)	4 (0.31)
16 - 20	75 (5.81)	60 (4.65)	9 (0.69)	4 (0.31)
21 - 25	83 (6.43)	162 (12.56)	5 (0.38)	4 (0.31)
26 - 30	47 (3.64)	116 (8.99)	10 (0.77)	4 (0.31)
31 - 35	47 (3.64)	96 (7.44)	5 (0.38)	2 (0.15)
36 - 40	23 (1.78)	72 (5.58)	4 (0.31)	4 (0.31)
41 - 45	40 (3.10)	62 (4.80)	6 (0.46)	3 (0.23)
46 - 50	17 (1.31)	43 (3.33)	6 (0.46)	3 (0.23)
51 - 55	29 (2.24)	24 (1.86)	11 (0.85)	4 (0.31)
>55	16 (1.24)	23 (1.78)	14 (1.08)	7 (0.54)

**Table 2:** Distribution of patients in relation to gender according to etiology of orofacial injury

Gender (n = 1289)	Road traffic accident	Physical assault	Fall	Others
Male	375 (29.09)	571 (44.29)	74 (5.74)	31(2.40)
Female	70 (5.43)	129 (10.00)	30 (2.32)	13 (1.00)

**Table 3:** Distribution of patients in relation to time of the year according to etiology of orofacial injury

Months (n = 1289)	Road traffic accident	Physical assault	Fall	Others
Jan-March	121 (9.38)	166 (12.87)	16 (1.24)	10 (0.77)
Apr-June	125 (9.69)	198 (15.36)	36 (2.79)	14 (1.08)
July-September	99 (7.68)	175 (13.57)	23 (1.78)	11 (0.55)
Oct-Dec	100 (7.75)	151 (11.57)	39 (3.02)	9 (0.69)

**Table 4:** Distribution of patients in relation to pattern of orofacial injury

Type of injury (n = 1289)	Number of cases	Percentage (%)
Luxation type (periodontal injury)	624	48.40
Dental hard-tissue injury	137	10.62
Soft-tissue injury	480	37.23
Bony injury	48	3.72

**Table 5:** Pattern of bony fracture according to etiology of orofacial injury

Supporting tissue injury	RTA	PA	Fall	Others
Alveolar fracture	4	4	1	1
Mandibular fracture	15	11	8	1
Maxillary fracture	1	2	1	0

to involvement in violent activity and physical activities (44.29%) followed by RTA (29.09%), whereas female victims (10.00%) are more likely to be assaulted in their homes by someone whom they know, followed by RTA (5.43%).

Road traffic accident in East Delhi may be accredited to the poor road conditions, widespread disregard for traffic rules, defective roads, poor street lighting, and defective layout of cross roads and speed breakers.<sup>19</sup>

The causal factor of maxillofacial injury is known to vary from one geographic region to another. Falls and RTA are generally believed to be most common cause of facial trauma in some studies.<sup>20-22</sup> This is in agreement with studies of Chandra-Shekhar BR et al,<sup>23</sup> Subhashraj K et al,<sup>24</sup> Sawhney P,<sup>25</sup> El-Sheikh et al,<sup>7</sup> Ugboko et al,<sup>5</sup> Erol et al,<sup>16</sup> Ansari et al<sup>17</sup> and Costa Ferreira Pedro et al<sup>18</sup> in their studies found that RTAs as the major cause of maxillofacial injuries. The results were consistent with findings of other studies conducted by Ortakoglu et al,<sup>26</sup> Mohan D,<sup>10</sup> Jagnoor,<sup>11</sup> Subhashraj K et al,<sup>3</sup> and Garg et al.<sup>27</sup> but differs from the trend shown by Haug<sup>28</sup> Magennis<sup>29</sup> and Kontio et al<sup>15</sup> have found fights and assaults as the main cause for maxillofacial injuries.

Similarly, in our study interpersonal assault was found to be most common etiology (54.29%) followed by RTA (34.52%) and falls (8.06%). Our contradictory finding may be due to the fact this tertiary care hospital is attended by relatively unemployed, illiterate and lower socioeconomic status patients. Alcohol and unemployment have been consistently associated with interpersonal violence.<sup>30,31</sup> Some studies have, indeed shown a high correlation between alcohol consumption and violence.<sup>32,33</sup> Alcoholics become more violent and this may be reason for higher incidence of fight and assault related maxillofacial injuries among male alcoholics as was found in the study by Lee et al.<sup>34</sup>

The etiological factors varied according to the age group studied, as the majority of trauma resulted from falls in children aged 0 to 10 years age. These findings are probably explained by the fact that this is a phase of motor skill development and therefore children of this age group are more susceptible to falls and might hit the face against the floor or obstacles. Due to lower socioeconomic status, people in this part of the country sleep on rooftops, especially during the summer months. A large proportion of the fall victims were children who had fallen from height while playing on flat roof tops. With the increasing age, physical assault becomes the main etiologic factor followed by RTA.<sup>34</sup>

The peak incidence was however observed in the age group 21 to 25 (19.68%) followed by 26 to 30 (13.71%). This finding is however in accordance with a number of previous studies.<sup>35,36</sup> This period is considered to be most active period of life in which people tend to remain outside in search of livelihood and are more vulnerable to assault, fall and RTA.

Regarding month of occurrence of orofacial injury, vacations and summer are considered to be period of higher incidence. In our study, maximum number of case reported in the month of April to June (28.98%) followed by January to March (24.26%) differs from the trend shown in result of study conducted by Guedes Orlando Aguirre et al<sup>37</sup> and Ji-Hyun B et al.<sup>38</sup> Our results are also different with that of Gilthorpe,<sup>39</sup> Subhashraj K et al,<sup>3</sup> Mohan D,<sup>10</sup> Jagnoor,<sup>11</sup> and Risto Kontio et al.<sup>15</sup> A study by Khateeb et al<sup>40</sup> has found that most number of injuries tend to occur in the month of January, whereas a study by Risto Kontio et al<sup>15</sup> has found June through August as the months of maximum maxillofacial injuries.

The most common type of orofacial injury was found to be luxation type of injury (48.40%) followed by soft tissue injury (30.98%). This finding is contradictory with the Gassner et al<sup>8</sup> and Le et al<sup>41</sup> who documented soft tissue injury as the most common injury. Out of luxation type injury avulsion is the most common, 105 (8.14%) patients reported with avulsed teeth and 137 (10.62%) patients reported with dental hard tissue injury. Patients suffering from crown fracture are usually seen at dental clinics and rarely report to medical accident and emergency department. Forty-eight (3.72%) patient reported with bony injury, among bony fracture, the mandible fracture was the most frequently fractured bone. This finding is in accordance with Lida et al,<sup>42</sup> Motamedi MH,<sup>13</sup> Erol B.<sup>16</sup> The higher involvement of mandible may be attributed to its prominence and also to its exposed anatomical position on the face. Most of the victims of RTA, while avoiding their head at the time of accident, may receive maximum impact to the mandible. This can also be a responsible factor for the higher involvement of mandible

compared to other facial bones in the maxillofacial injuries. The studies conducted by Ugboko et al,<sup>5</sup> Veerasha et al,<sup>43</sup> Ortakoglu et al<sup>26</sup> and Qudah Mansour et al<sup>44</sup> have also found mandibular fracture to be the most common maxillofacial injury.

## CONCLUSION

The result of this study shows that the Orofacial injury is fairly common in violence related events in Delhi affecting especially men with a mean age of 21 to 25 years of age who are more prone to become involve in outdoor activity and aggression. Accurate policies of orofacial trauma prevention must be established, capable of stimulus the expansion of appropriate protocol for the management of these injuries.

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