

Pattern of maxillofacial trauma at a tertiary health care centre in Nuh district of Haryana state, India

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Abstract

Aims: Maxillofacial trauma is a common presentation in Accident & Emergency (A & E) department of hospitals either as an isolated injury or as a part of multiple region injuries. This study aimed to assess the pattern of maxillofacial trauma amongst patients reporting at tertiary health care centre in Nuh district of Haryana state, India.

Methods: A retrospective study was carried out from June 2019 to May 2022 of patients visiting the A & E department of SHKM Govt. Medical College, Nalhar (Nuh), Haryana. A total of 1105 Oral and Maxillofacial trauma patients were included in the study to record

patient’s demographic data, etiological factors, type of injury, pattern and site distribution of maxillofacial fractures and any other associated injuries.

Results: The maximum number of maxillofacial injuries were observed in the age group of 21–30 years, with males predominantly affected more in all age groups. Most injuries were caused by road-side accidents (51.4%), followed by physical assault and falls in 32.3% and 14.1% respectively. Soft tissue injuries and mandibular fractures were the most common type of injuries. Suturing of soft tissue injury was the most common emergency procedure done under local anesthesia.

Conclusion: It is evident from our study that road side accidents were the main cause of trauma in young people so more preventive initiatives to improve road safety measures are necessary to decrease the trauma from traffic accidents especially in the Nuh district of Haryana which is the most backward district of India.

Keywords: Maxillofacial trauma, road traffic accident, retrospective analysis.

Introduction

Trauma is an inevitable part of human life and one of the leading causes of death. The World Health Organization has estimated that trauma is responsible for mortality rate of around 5.8 million people and cause temporary or permanent disability in 50 million people worldwide annually.[1] The face often constitutes the first point of contact in various human interactions because of its prominent position and is thus the most frequently traumatized site of the body. Maxillofacial trauma is a common presentation in Accident & Emergency (A & E) department of hospitals either as an isolated injury or as a part of multiple region injuries to the head, neck, chest, spine, abdomen and extremities. The injuries may vary from simple abrasion to complex fractures of maxillofacial skeleton.[2] The pattern of maxillofacial trauma varies from country to country depending on geography, population density, socioeconomic status, cultural practice, occupation and its related hazards. There is high prevalence of maxillofacial traumatic injuries in India which has huge impact on the patient's quality of life as these injuries causes functional, psychological, cosmetic and physical disabilities.[3] Shaheed Hasan Khan Mewati Government Medical College (SHKM GMC) is a tertiary health care centre situated in Nuh (Mewat) district, in the southwest of Haryana state, India. National highway (NH) 248A

passes through the Nuh district connecting the Gurugram district of Haryana to Alwar district of Rajasthan (figure 1). Western peripheral expressway is also passing through Nuh. In April 2018, NITI Aayog (National Institute for transforming India) identified Nuh, a district in the National Capital Region, the most backward district of India. In the NITI Aayog report, 101 districts were assessed on 49 development indicators such as health, education, agriculture, financial inclusion, skill development, and basic infrastructure, and Nuh scored (26%) the lowest across the country. Around 79% of Nuh's population comprises of Muslims (Meo-Muslims), a minority community that follows parts of both Islamic and Hindu customs.[4] Majority of the population (88%) resides in rural areas whereas only 11.39% lives in urban regions. The education statistics reveal that merely 37.6% of females are literate as against 73% literacy rate among males.[5] SHKM, GMC is the only institution providing tertiary level health care services to a large population not only of Nuh and nearby districts of Haryana like Faridabad, Palwal but also to adjoining states like Rajasthan and Uttar Pradesh. Hence a 3 year retrospective study was conducted to evaluate the pattern of maxillofacial injury. An understanding of the cause and severity of maxillofacial trauma would help in formulating effective preventive measures for this region.

Material & Methodology

A retrospective study was carried out from June 2019 to May 2022 of patients visiting the A & E department of SHKM Govt. Medical College, Nalhar (Nuh), Haryana. A total of 1105 Oral and Maxillofacial trauma patients were included in the study. Detailed history, clinical and radiological findings of the patients were taken from their record files. It was further segregated based on

their demographic details, etiological factors, type of injury, pattern and site distribution of maxillofacial fractures and any other associated injuries which were entered into excel format. The etiological factors were divided into road traffic accidents (RTA), physical assault, injuries associated with fall and other injuries related to pedestrian, sports, occupational and animal bite. Soft tissue injuries were further grouped into upper lip, lower lip, cheek, chin, zygoma, buccal vestibule and tongue regions. Dental injuries were classified according to Ellis and Davey classification [6]. The mandibular fractures were divided into condyle, ramus, angle, body, parasymphysis, symphysis, subcondyle, coronoid and dentoalveolar fractures. Midface fractures were divided into maxillary fractures (Le Fort I, II, III), zygomatic fracture and palate fracture. [7] The diagnosis of maxillofacial injuries was made on history, clinical examination, sign/symptoms and interpretation of radiographs.

Results

Out of 1105 patients maximum number of patients (81.3%) reported were mainly from Nuh district, followed by Faridabad and Gurugram district of Haryana (9.9% & 2.7% respectively), while 6.06% patients were came from adjoining districts of Rajasthan and Uttar Pradesh state. Males (76.7%) were affected more from trauma as compared to females (23.3%) (Figure 2). Most common age group affected from trauma was of 21-30 years (29.6%) (Figure 3). The youngest patient was 10 months old and the oldest patient was 73 years of age. Main etiological factor of trauma was RTA (51.4%) followed by physical assault (32.3%), fall from height (14.1%) and other injuries (2.08%) (Figure 4). RTA was also the main cause of trauma in 21-30 years of age group while fall from height was the predominant cause

of trauma in below 10 years of age (figure 5). Among all injuries soft tissue injuries were present in 75.7% of patients followed by hard tissue injury (15.5%) and dental injury (14.9%). On analyzing the soft tissue injuries, maximum injuries occurred on upper lip (27.2%), and minimum on tongue region (0.8%) (Table 1). In dental injuries, Ellis class 5 (Avulsion) was seen in 8.4% of the patients followed by Ellis class 3 in 2.8% of the cases. The anatomical site distribution of the fractures showed that 51.7% of fractures occurred in the mandible followed by midface region i.e. 28.4%. (Table 2). In mandibular fractures, parasymphysis region showed maximum percentage of fracture i.e. 31.4% and subcondylar region (2.2%) showed the least common site of fracture (Table 3). With regard to the treatment rendered to the patients, suturing for soft tissue injury was done in 30.4% of cases and wire splinting was done in 3.9 % in A& E department as primary treatment. Closed reduction using Erich arch bar and maxillomandibular fixation was treatment of choice in majority of cases.

Discussion

Maxillofacial injury is one of the most commonly involved component following trauma patients reporting to A & E department. The epidemiology of maxillofacial trauma varies in different regional areas within the country and is influenced by population density, socioeconomic status, and cultural differences. [3]

In present study, male to female ratio was 3.3:1 which shows a high prevalence of maxillofacial trauma in males. Similar results were found in many studies [8-15] which clearly shows males predominantly are affected more by trauma than females. This can be due to the fact that males are more involved in outdoor jobs, social activities, traveling, driving profession, sports and inter

personal violence. Due to the culture of Meo – Muslims, females have restricted mobility & their access to resources and services such as health, education, employment is limited so they are mostly confined to indoor activities and household chores, is another important aspect of females being less affected by trauma, specially in Nuh district [32].

The affected patients were mostly of 21-30 years of age group as observed in our study. Similar results were seen in studies done by Singaram M et al, [10] Manodh P et al, [11] Prasad C et al [22] in different areas of Chennai, India and Udeabor SE et al [30] in Nigeria. A number of reasons can be attributed to this observation such as careless driving of motor vehicles by youngsters, use of vehicle despite having improper or no driving license, non usage of seat belts and helmets, violation of road traffic rules and social excitement. In our study main etiology of trauma was road traffic accident (51.4%) followed by physical assault (32.3%) and fall from height (14.1%). Similar results were reported in many published studies done by Singaram M et al [10] in Chennai, Thadani S et al [11] in Gujarat, Pandey S et al [12] in North India. On the contrary, physical assault was the main cause of trauma in developed countries like Italy, South America & Seoul, Korea [13-15].

In our study it was also seen that out of total cases of fall from height, 62.1% were children below 10 years of age. This finding can be attributed to the careless and negligent behavior of parents towards their children due to large family size. The average family size in Nuh district is seven when compared to other Backward Region Grant Fund (BRGF) districts of Haryana where it is five. A higher percentage of households residing in 'kuccha' housing in Nuh is indicative of the poor socioeconomic status of the region. [32] Even the houses

don't have parapet walls on roof which may increase the chances of fall while playing on roof, sleeping on roof tops at night especially during summer season due to acute shortage of electric supply, may be another contributing factor.

It was observed in our study that 15.5% of patients had hard tissue injuries whereas 75.7% were reported with soft tissue injuries. In a study by Husaini et al [33], it was observed that extreme shearing type of forces produced by road traffic accidents causes most of the soft tissue injuries. In our study, mandible was the most common site (51.7%) of fracture due to trauma. Kar et al [18] implicated the reasons for increased fracture of mandible as patients more often reflexly turn to their side when there is a sudden impact directed to the face, thus presenting the mandible to be the first bone to directly encounter with the trajectory of force and also it has less bony support than the maxilla. Hence the finding of the present study is in consonance with most of the studies done in various other regions of India [17-23]. However, contrary to our findings, zygoma was the most common site of fracture as per a study conducted by Arangio P et al [13] in Italy.

In present study, mandibular parasymphysis region (31.4%) sustained the highest incidence of fracture followed by condyle (16.8%) region. This can be explained by the fact that chin is one of the most prominent and movable parts of facial bones and not wearing helmets or seatbelts while speeding may cause direct injury to chin. Since parasymphysis region is anatomically weak, partly due to long roots of canine teeth, a direct blow to chin can result in parasymphysis fracture more readily [20]. This finding is consistent with the findings of other studies conducted by Manodh P et al in Chennai, Chandra L et al in Delhi –NCR,

Malik S et al in Rohtak district of Haryana, in India [16,20,21] and by King RE in USA and Wong KH in Singapore [24-25]. But, our result was in contrast to the findings of Nair et al [26] & Udeabor et al [30] which showed body of mandible as the most common site of mandibular fractures while Ogundare et al [29] showed angle of the mandible as the most prominent sites of mandibular fractures. In our study fracture of zygomatic region (28.4%) was most common in case of mid-face fractures. This finding was similar to the study conducted by Chandra et al [20] in Delhi- NCR and Al Khateeb et al [31] in United Arab Emirates (UAE). However, study done by Chandrashekhar et al [17] in Mysore city showed nasal bone as the most common site of mid face fracture which was not in accord with the results of our study. Initial management of patients was done in A & E department with suturing of soft tissue injuries and wire splinting of fractured segment. Definitive management of fracture cases when required was done by closed reduction / open reduction.

Maxillofacial trauma deserves special attention as it involves skeletal, dental, and soft tissue components of face and may lead to significant morbidity with functional and esthetic concerns. This was the first exploratory study to be undertaken on Nuh District of Haryana, India that provides an insight about the pattern of maxillofacial injuries in this area. Nuh district is home to a large number of commercial drivers as most young men in the area are pursuing heavy vehicle driving as a profession. These drivers park their vehicles on the main NH -248A due to no provision of truck bays. Other commuting vehicles also park their vehicle along the stretch of highway to enjoy the famous local food of this area i.e. 'Biryani' from roadside vendors. Most of the road side accidents occur due to these parked vehicles

along the highway, wrong side driving, jaywalking, untrained drivers driving heavy vehicles, narrow road, hilly terrain, no zebra crossing/pedestrian movement facility and less police deployment. It is important for both government and society to take all the essential steps like campaigning against drunk driving, educate people to use preventive measures such as the use of seat belts, wearing of helmets, introduction of speed calming and rumble strips and enhanced deployment of traffic personnel to crackdown on rule violators. Civic agencies may also help authorities in installing proper signage and markings at various intersections, warning boards before merging traffic, properly constructed speed breakers and central verges to prevent accidents.

Conclusion

It is evident from our study that road traffic accidents were the major etiological factor of orofacial injuries and the young adult males (21-30 years of age group) were the main victims. Soft tissue injuries and mandibular fractures were the most common type of injuries seen. So, more attention should be directed to younger age group by authorities for strict implementation of road safety legislations to decrease the incidence of traffic accidents in Nuh district of Haryana, India.

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Legend Figures



Figure 1- Location of Nuh District

Figure 2- Gender distribution of Maxillofacial trauma

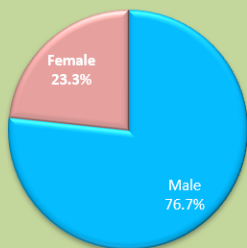


Figure 3: Distribution of Gender with different age groups

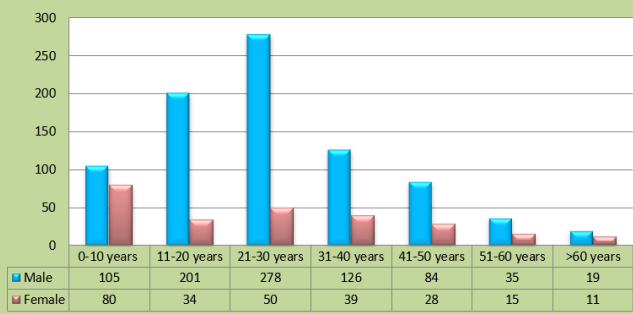


Figure 4: Distribution of gender with etiology of trauma

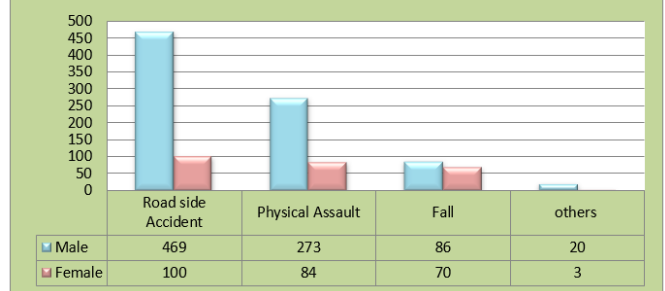
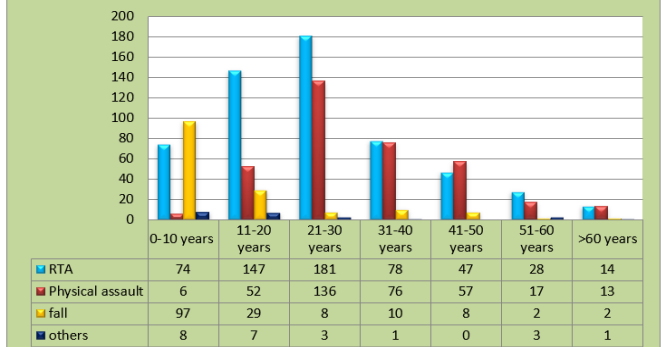


Figure 5: Distribution of etiology of trauma with different age groups



Site of Soft tissue injury	Percentage_n (%)
Upper lip	228 (27.2%)
Lower lip	160 (19.1%)
Chin	132 (15.7%)
Cheek	119(14.2%)
Zygoma	101 (12.06%)
Buccal vestibule	48 (5.7%)
Tongue	7 (0.8%)

Table 1: Distribution of site of soft tissue Injury

Site of Hard tissue injury	Percentage N (%)
Mandible	89 (51.7%)
Zygomatic Arch	49 (28.4%)
Dentoalveolar	14 (8.1%)
Maxilla	14 (8.1%)
Palate	4 (2.3%)
Le fort 1	2 (1.1%)

Table 2: Distribution of site of hard tissue injury

Site of fracture	Number of patients	Percentage
Para symphysis	28	31.4%
Condyle	15	16.8%
Angle	13	14.6%
Body	12	13.4%
Symphysis	12	13.4%
Ramus	4	4.5%
Coronoid	3	3.3%
Subcondyle	2	2.2%

Table 3: Distribution of site of Mandibular fractures