



EPIDEMIOLOGY OF ORO-FACIAL TRAUMA REPORTED TO A TERTIARY CARE CENTRE –A ONE YEAR DESCRIPTIVE STUDY

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ABSTRACT

Background: Oro-facial trauma represent one of the most important problems of public health interest because of high incidence and diversity of trauma.

Methods: A descriptive statistical analysis was developed based on data collected in a cross sectional study conducted for a period of 12 months. Information regarding demographic details, etiology, time, type of injury, use of safety device and type of radiograph advised was recorded on a pre-structured format.

Results: A total of 219 subjects with mean age of 33.34±12.75 years were analysed. The reported male :female ratio was 2.9:1. The most common etiology of trauma was road traffic accidents, mandible (58.30%) was most frequently involved.

Conclusion: This study support the view that RTAs (road traffic accidents) are the most common etiology of oro-facial trauma. According to these data it seems reasonable to assume that road traffic legislation enforcement and continuous public education toward the use of restraining devices should be encouraged.

KEYWORDS: Injuries, wounds, zygomatic, maxillary and mandibular fractures.

Introduction

Every year, injuries contribute to a significant number of deaths, hospitalizations (for short and long periods), emergency care, disabilities (physical, social and psychological), amputations, disfigurement, pain, suffering and agony. Among the total disability-adjusted life-years (DALYs), 13% were due to injuries with unintentional and intentional injuries contributing to three-fourth and one-fourth of total DALYs, respectively (Gururaj, 2005)^[3]. In India, non-communicable diseases were estimated to account for 72% of the total deaths out of which 12% were due to injuries (World Health Organisation 2014)^[26]. The orofacial region comprises only 1% of the total body area but orofacial injuries account for 5% of all injuries (Shetty, Glynn & Brown, 2008)^[22]. According to Kapoor & Kalra (2008)^[12] maxillofacial region occupies the most prominent position in the human body, it often constitutes the first point of contact in various human interactions like assaults and thus it is a common presentation in emergency departments. Ghodke, Bhojar & Shah (2012)^[6] reported that although mandible is the largest and strongest bone of the region, it is the 10th most often injured bone in the body and accounts for 36% to 59% of all maxillofacial fractures.

Trauma is a major preventable cause of hospitalization and intensive care utilization and consumes a significant amount of the health care resources. There is immense need of coordinated and sequential acquisition of related information to permit clinical and research priorities to be established for effective treatment and prevention of these injuries. Thus the present research was undertaken with a primary objective of assessing the Type, Pattern, Prevalence and causes of Orofacial Traumas reported to emergency services of M.M Institute of Medical Sciences & Research (M.M.I.M.S & R.) Mullana, Ambala.

Materials and Method:

The present cross-sectional study conducted at the emergency department of a tertiary medical care centre of Haryana after obtaining approval from Institutional Ethical committee (Project no.361 dated 27-11-2013). A data record format was custom

designed and was discussed with the faculty of Department of Oral Surgery before the start of study. The pilot study was carried out to assess feasibility & to finalize the format and final study was conducted for a period of 12 months (1st October 2013 to 30th September 2014). All patients of trauma having orofacial injuries reporting to emergency department of M.M.I.M.S.&R. after obtaining written consent from those who could and proxy consent in cases of unconscious patients were included in the study. Demographic details like patient's age, gender, occupation (Gururaj & Maheshwaran, 2014; Park, 2013)^[8,19] income per capita (Shankar, 2013)^[25] along with details pertaining to trauma including aetiology (Glendor, 2009; Ghogke, 2013 & Kapoor & Kalra, 2012 &)^[4,6,12], date, time (trauma occurring in daytime/night time), place (Haryana, Uttar Pradesh, Punjab & Himachal Pradesh) and season (winter, summer & rainy season) of traumatic injury and type of facial injury (Soft tissue or combination of both hard and soft tissues) were recorded in self-structured format. Information regarding the usage of safety devices at the time of injury was ascertained by direct questioning of the patient or the accompanying attendant and was recorded in the same format. The clinical examination was done and investigations were advised by the specialist from the department of oral surgery posted in the emergency unit. Assessment of other bodily injuries at various anatomical sites was also diagnosed by the concerned doctors posted in the emergency department. Patient examination was always followed by prompt & appropriate conservative and surgical treatments of orofacial injuries by oral surgeons in dental college along with treatment for associated injuries by the medical doctors in the institute. The fractures of the middle third of face were classified according to Rowe & Williams, 2009^[20], mandibular fractures by classification of D.Sinn, S.Hill and S.Watson which is similar to Dingman and Natvig's classification, 1969 (Mihailova, 2006)^[15], Dentoalveolar injuries by Ellis Classification (Kohli, 2009)^[14].

Statistical Analysis:

The data so collected analysed was using SPSS13 package.

Proportions of cases belonging to specific group of parameter or having a particular problem were expressed in absolute number and percentages and were compared using Chi-Square(χ^2) test of significance. Statistical significance was set at $p < 0.05$.

Results: A total of 219 subjects were examined with mean age of 33.34 ± 12.75 years and a peak incidence of trauma in the 20-39 years age group (62.57%) (Table 1). In the study, road traffic accidents (RTAs) 76.3%(176) were the most common cause of trauma with 61.7% (103) of those occurring during day time (Between 6:00 A.M. to 6:00 PM) (Table 2). Among males as well as females RTAs was the most reported etiology of trauma, 78.5% (128) and 69.6 % (39) respectively. Out of 176 reported cases of RTAs, only 2.8% (5) were using safety measures and those were all males. Out of the total sample 84.0% (184) reported to the emergency department within 24 hours of trauma while 9.6% (21) within 24 to 72 hours and 6.4% (14) after 72 hours of trauma. In this study 49.8% (109) traumatic injuries were during winter season and during daytime followed by 30.6% (67) in summers and 19.6% (43) in rainy season. Among the subjects with orofacial fractures, mandibular fractures were most common (58.30%) (Table 3). Only 3.7% (8) of the cases had traumatic tooth injuries and most commonly affected teeth were maxillary incisors. Associated bodily injuries were found in 16.9 % (37) subjects (Table 4). A total of 443 radiographic investigations were advised for 219 subjects, out of which 32.05% (142) were Water's view, 27.31% (121) were Antero-Posterior view, 8.80% (39) Lateral Oblique view, 10.38% (46) CT (Computed Tomography) scan, 19.86% (88) OPG (Orthopantomogram) and 1.58% (7) IOPAs (Intraoral periapical Radiograph).

Table:1 Descriptive characteristics of the Sample

AGE GROUPS	GENDER					
	Male		Female		Total	
	N	%age	N	%age	N	%age
<20 years	14	8.58%	5	8.92%	19	8.67%
20-39 years	102	62.57%	21	37.5%	123	56.16%
40-59 years	40	24.53%	29	51.78%	69	31.50%
>60 years	7	4.29%	1	1.78%	8	3.65%
Total	163	100%	56	100%	219	100%

Table 2 : Showing age wise distribution of subjects in relation to etiology of traumatic injuries

ETIOLOGY OF TRAUMA	AGE GROUPS					TOTAL
	<20 years	20-39 years	40-59 years	60 years & above		
Road Traffic Accidents (RTAs)	N 11	96	58	2		167
	% 57.9%	78.0%	84.1%	25.0%		76.3%
Falls	N 6	8	4	1		19
	% 31.6%	6.5%	5.8%	12.5%		8.7%
Fire, Explosion	N 0	2	0	0		2
	% 0.0%	1.6%	0.0%	0.0%		0.9%
Animal related injury	N 1	3	0	2		6
	% 5.3%	2.4%	0.0%	25.0%		2.7%
Assault	N 1	13	7	3		24
	% 5.3%	10.6%	10.1%	37.5%		11.0%
Sports related injuries	N 0	1	0	0		1
	% 0.0%	0.8%	0.0%	0.0%		0.5%
Total	N 19	123	69	8		219
	% 100.0%	100.0%	100.0%	100.0%		100.0%
p Value	0.001*					

None of the 219 subjects had occupational accidents
 – Number of subjects

*Highly statistically significant

Table 3: Showing frequency distribution of Orofacial fractures

ORO- FACIAL FRACTURE	NUMBER OF FRACTURES	%
· Maxillary bone fractures	17	7.2%
· Nasal bone fractures	25	10.6%
· Zygomatic complex fractures	27	11.5%
· Orbital bone fracture	5	2.1%
· Frontal bone fracture	2	1.0%
· Temporal bone fractures	0	0.0%
· Mandibular fractures	137	58.3%
· Lefort fractures	22	9.4%
Total	235	100.0%

Table 4: Showing relationship between associated bodily injuries and orofacial injuries

ASSOCIATED BODY PART INJURIES	TYPE OF TRAUMATIC INJURIES				TOTAL	
	Soft tissue injuries		Combination of soft and hard tissue injuries			
	N	%	N	%	N	%
Cranium	1	1.22%	1	0.00%	2	0.91%
Upper Limbs	8	8.89%	13	12.50%	21	9.58%
Lower limbs	4	6.74%	9	3.57%	13	5.93%
Abdominal injury	1	1.11%	0	0.00%	1	0.45%
Absent	76	82.82%	106	83.9%	182	83.10%
Total	90	100.0%	129	100.0%	219	100.0%

Discussion:

According to Singh, Lateef, Khan A & Khan T (2005)^[21] Trauma is an emerging social disease which imposes a substantial burden on the individual, society and health resources. Recent urbanization, motorization with population explosion, inaccessible & unaffordable emergency health services have contributed to the increasing burden of injury in the developing countries of the world.

In present study, irrespective of age, maxillofacial traumas were more common among the male than female which was similar to the study by Kapoor & Kalra (2012)^[12] and Singh et al (2005)^[21]. In the present study, male: female ratio of 2.9:1 was observed for the trauma patients which was similar to the findings reported by Malik & Singh (2013)^[16]. The age wise distribution pattern of maxillofacial injuries demonstrated that people of all ages were affected with the peak incidence in the 20-39 years age group (56.16%) and 40-59 years (31.50%). This finding is in accordance with studies by Jair et al^[10], Kaur & Lehl, 2012^[11] & Shetty et al., 2008^[22] where they reported an increase in the incidence of trauma in the 2nd to 4th decade of life. The possible explanation for this is that individuals between the ages of 21 and 40 years frequently drive motor vehicles carelessly, are more likely to be involved in violence which is leading causes of maxillofacial trauma and take part in dangerous exercises and sports (Shayyab, Alsoleihat, Ryalat & Khraisat 2012)^[24]. The most common cause of maxillofacial trauma analyzed in the present study was road traffic accidents (RTAs) (76.3%) which were most prevalent in all the ages and both the genders. These findings were consistent with those of, Jair et al^[10], Kapoor & Kalra (2012)^[12], Sadananda, Veerasha & Hiremath (2010)^[23] who all reported RTAs to be the most common etiological factor causing maxillofacial trauma. This may be attributed to a innumerable factors like inadequate road safety awareness, with unsuitable road conditions, violation of speed limit, old vehicles without safety features- such as air bags, poor vehicle maintenance, lack of enforcement of traffic rules, failure to wear seatbelts or helmets, use of alcohol or of other intoxicating agents and inexperienced young drivers.

About 84% of the trauma cases reported to the emergency department in less than 24 hours of trauma while 9.6% within 24-72 hours and 6.4% after 72 hours. National Highways Authority of India (NHAI)^[17] has made it mandatory to deploy one ambulance which will provide "round the clock" ambulance service for accident victims and one patrolling vehicle for every 50 km stretch (NHAI)^[17].

There is a need of assessments on the availability, utilization and quality of such services, however, no such evaluation was done in the present study. Further studies can be planned focusing on these services that would improve our understanding of the observations presented in this paper.

In this study 50% of the trauma cases occurred in winters, 30.6% cases in summers and 19.6% in rainy season. This is in accordance with Kumar, Agarwal, Singh & Garg, 2014^[13]. It may be due to shorter duration of daylight in winters in comparison to summers and dense foggy weather conditions leading to poor visibility in early morning and late evening hours, in winters social events occur which is accompanied by alcohol consumption followed by driving under the influence of alcohol which can lead to accidents.

Most concomitant bodily injuries were observed in the present study, on the upper (9.58%) and lower (5.93%) extremities, cranium (0.91%) and abdomen (0.45%). Similar findings were reported by Brasileiro & Passeri, 2005^[11]. In the present study, 61.2 % trauma occurred between 6:00 AM to 6:00 PM. Similar findings were observed by Veerasha, 1987^[27] who observed that maximum number of cases occurred between 11:00 A.M. and 12:00 noon. He stated that as people would remain indoors from 12 midnight to 3 A.M. and lesser number of vehicles would be plying on the roads at that time, the risk of RTAs got reduced. Only 2.8 % of the patients were using any safety device at the time of trauma which was less than findings of Bali, Sharma, Garg & Dhillon, 2013^[2] thus making them more susceptible to head and neck injuries as well as maxillofacial traumas.

The most common sites of maxillofacial fractures were mandible (58.3%), zygomatic complex (27.6%) and nasal bone (25.5%). Similar pattern of maxillofacial fractures were reported by Brasileiro & Passeri, 2005^[11], mandible is inherently weak at the neck of condyles, parasymphysis due to long roots of canine and angle due to abrupt change in direction between strong body and thin ramus and presence of third molars, and hence found to be susceptible for fractures (Gadre et al, 2013)^[7]. The mobility of the mandible, its prominent position, various muscle attachments and their influence, the presence of developing or completed dentition Hupp, Ellis & Tucker, 2009^[9], the direction and quantity of force that the mandible is exposed have also been implicated (Rowe & Williams, 2009)^[20].

Zygomatic complex fractures were the most common type of middle third facial fractures which were consistent with the findings of Gupta AK, Gupta A, Garg & Bajaj, 2009^[5]. Nasal bone fractures were more commonly observed among the 20-39 years aged adults and the elderly which could be attributed to higher number of assaults cases (52%) reported in these age groups while higher incidence of zygomatic complex fractures were associated with RTAs (33.3%), falls (37.5%) and assault (12%). Punjabi, Rehman, Ali & Ahmed, 2011^[18] stated that the commonest cause of zygomatic bone fracture was found to be RTA 50%, followed by assault (23.17%), fall (20.73%), sports injuries (3.65%), and others (2.43%) respectively.

Clinical examination is often limited in maxillofacial trauma patients due to obscuration by overlying edema, hemorrhage and soft tissue injuries. Radiographs play a significant role in diagnosis and detection of orofacial injuries and also provide a permanent record for medico legal purposes. The most common radiographic investigations advised were Water's view (PNS) (32.05%), antero posterior view (27.3%) and OPG (19.86%). These findings were not similar to the findings of Bali, Sharma, Garg & Dhillon, 2013^[2] who observed OPG and IOPAs to be the most commonly advised investigations. This discrepancy may be attributed to the fact that in the present study, dentoalveolar fractures were present in only two patients.

The majority of the trauma survivors with moderate or severe grades of injuries and their families not only experience life-long psychosocial impact leading to poor quality of life but also suffer a huge economical drain on the limited financial resources. Damage to goods, property and vehicles lead to repair costs based on the extent of damage while work absenteeism leads to loss of

productivity (Shetty, Glynn & Brown, 2008)^[22]. However, no such post recovery evaluation was done in the present study, which could be a limitation of the present study, therefore socio-economic influence as well as post recovery assessment warrants further extensive research.

The coordinated and sequential collection of information concerning epidemiology of maxillofacial injuries in this study may assist health care providers understand the cause, severity, and temporal distribution of maxillofacial trauma permitting clinical and research priorities to be established for effective treatment and prevention of those injuries.

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