



## "CLINICAL STUDY OF MAXILLOFACIAL TRAUMA IN MUZAFFARNAGAR"

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### ABSTRACT

The present clinical study is comprising of 181 cases of Maxillofacial trauma (MFT) brought to Emergency and then transferred to the Department of ENT & HNS of Muzaffarnagar medical college & Hospital in a span of 20 months (i.e from June 2015 to Jan.2016) and the study reveals that Road traffic accidents (RTA) is the most common etiology of MFT and accounts for 94 cases (51.92%) followed by Fall from height in 26 cases (14.37%), Physical assault in 22 cases (12.16%), Bear slap in 18 cases (9.94%), other causes including work-place accidents & domestic accidents in 12 cases (6.63%) and Gun shot injuries in 9 cases (4.98%). The cases of MFT were analysed according to the etiology, age, sex distribution and type of injury (soft tissue injury, skeletal injury or mixed type of injury). Maximum number of MFT cases lies in the age group of 21-30 years i.e 42 cases (23.20%) & 31-40 years i.e 38 cases (20.99%) and together accounts for 80 cases i.e 44.19% of all 181 cases. The mixed type of injury was commonest i.e reported in 114 cases (62.98%) involving both soft tissue and skeletal components and amongst the skeletal component middle and lower third of face was most commonly involved. Pain and difficulty in chewing was the commonest presentation in RTA's.

### KEYWORDS

Maxillofacial trauma (MFT), Road traffic accidents (RTA), Fall from height, Physical assault.

### INTRODUCTION:

Maxillofacial region (MFR) involves soft and hard tissues forming the face extending from the frontal bone superiorly to the mandible inferiorly, the maxillofacial bony complex is composed of maxilla, zygoma & nose and constitutes the middle one third of the face. The face being the most exposed part of the body is particularly prone to trauma, trauma to the facial region causes injuries to the skeletal components, dentition as well as soft tissues of the face<sup>1</sup>.

With today's social and cultural activities, personal interactions, greater leisure time, participation in sports activities and growing traffic volume, the risk of physical trauma has increased markedly<sup>2</sup>. Trauma also results due to Gun shot (missile injury), violence and Physical assault as stated by other author's<sup>3,4</sup>.

Complexity of the injuries are more with high speed trauma. Age and sex of a person is the determining factor in most of the cases of MFT<sup>5</sup>. The mean age of presentation is between 2<sup>nd</sup> & 3<sup>rd</sup> decade of life<sup>3,6,7</sup> and according to the age previously males were more commonly involved, but with time difference gap between genders is decreasing due to advanced lifestyle.

Maxillofacial trauma can occur alone or in association with other injuries like chest & abdominal trauma, orbital injuries, penetrating neck injuries, injury of cervical spine, laryngotracheal trauma, other skeletal injuries etc, so no facial fracture should be evaluated as an isolated bony injury and approached without regard to all surrounding structures. Not only do all bones of the face have numerous superficial articulations, but also all relate in some fashion directly with the skull base. Therefore the maxillofacial trauma surgeon must be familiar with the anatomy of the entire skull and be skilled in surgical procedures that involve bone immediately adjacent to the brain, eyes, cranial nerves, salivary glands, major vessels, oropharyngeal soft tissues and teeth<sup>8</sup> and

this calls for a close monitoring of the patient along with quick first aid treatment, securing airway, breathing & circulation as well as interaction with specialists from other streams to treat the patient as a whole and to keep the patient alive is the only priority of the team primarily and at the same time to keep a clear and accurate record of the events both from referral and medico-legal point of view<sup>9</sup>.

### MATERIAL AND METHODS:

The Present study was conducted in the Department of ENT & HNS, Muzaffarnagar medical college and Hospital, Muzaffarnagar, Uttar Pradesh.

**STUDY DURATION :** Total duration of study was 20 months ( i.e from June 2015 to Jan 2017).

**STUDY POPULATION :** Study was conducted on 181 patients who attended the emergency department of the hospital with MFT and were then transferred to the ENT department of the same hospital for further management once the vitals of the patient are made stable.

### INCLUSION CRITERIA:

All the cases of MFT of any age group, sex or any type of injury to maxillofacial region were included in the study.

### EXCLUSION CRITERIA:

1. All those patients who were treated on OPD basis
2. Dead on arrival
3. Patients with associated complex head injuries requiring referral.

### SELECTION OF CASES:

During this period a detailed history with respect to sex, age, etiology of trauma and clinico-symptomology was taken from

every conscious patient followed with meticulous examination, but in cases of unconscious patients primarily airway, breathing, circulation & vitals were assured followed by history from attendants and examination.

Cases were then allocated to six different etiological groups involving three type of injuries. All the patients of MFT were adequately monitored and treated conservatively and surgically depending upon the situation, all the routine investigations such as General blood picture, Complete blood counts, ABO-RH (blood grouping), Viral markers, X- Ray chest, X- Ray Paranasal sinuses & facial bone and CT scans was done.

**OBSERVATIONS :**

The study on 181 patients of Maxillofacial trauma showed that Road traffic accidents was the most common etiological factor and accounts for 51.92% of all cases followed by Fall from height 14.37%, Physical assault in 12.16%, Bear slap in 9.94%, other causes such as workplace & domestic accidents accounts for 6.63% of cases and Gun shot injuries were seen in 4.98% of cases as depicted in Table no. 1.

**TABLE 1 : SHOWING ETIOLOGY AND SEX DISTRIBUTION IN CASES OF MAXILLOFACIAL TRAUMA**

ETIOLOGY OF TRAUMA	TRAUMA CASES		MALES		FEMALES		
	NUMBER	%	NUMBER	%	NUMBER	%	
ROAD TRAFFIC ACCIDENTS	94	51.92	67	53.17	27	49.09	
FALL FROM HEIGHT	26	14.37	14	11.11	12	21.82	
PHYSICAL ASSAULT	22	12.16	18	14.29	4	7.28	
BEAR SLAP	18	9.94	10	7.94	8	14.54	
GUN SHOT INJURY	9	4.98	8	6.35	1	1.82	
OTHERS	WORKPLACE ACCIDENTS	10	5.53	9	7.14	1	1.82
	DOMESTIC ACCIDENTS	2	1.10	0	0	2	3.63
TOTAL	181	100	126	69.61	55	30.39	

Maxillofacial trauma was common in males i.e 69.61% as compared to females i.e 30.39% and male to female ratio was 2.29:1 and the worstly affected age group was 21-30 years (23.20%) and 31-40 years (20.99%) as depicted in Table no. 2.

**TABLE 2 : SHOWING RELATION BETWEEN AGE GROUPS AND ETIOLOGY OF MAXILLOFACIAL TRAUMA.**

AGE GROUP IN YRS	TRAUMA CASES ROAD TRAFFIC ACCIDENT		FALL FROM HEIGHT		PHYSICAL ASSAULT		BEAR SLAP		GUN SHOT INJURY		OTHERS	
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
0-10	12	6.63	2	1.10	6	3.32	1	0.56	3	1.66	0	0
11-20	28	15.47	14	7.73	6	3.32	2	1.10	5	2.75	0	0
21-30	42	23.20	30	16.58	4	2.21	5	2.75	1	0.56	2	1.10
31-40	38	20.99	25	13.81	3	1.66	4	2.21	2	1.10	2	1.10
41-50	24	13.27	9	4.97	2	1.10	6	3.32	4	2.21	3	1.66

51-60	22	12.15	8	4.42	2	1.10	3	1.66	2	1.10	1	0.56	3	1.66
≥ 61	15	8.29	6	3.31	3	1.66	1	0.56	1	0.56	1	0.56	2	1.10
TOTAL	181	100	94	51.92	26	14.37	14	7.73	22	12.16	18	9.94	9	4.98

The maximum number of RTA's i.e 86 cases out of a total of 94 RTA cases were reported from the National Highway no. 58, while physical assault cases belonged to nearby villages of Muzaffarnagar. Injury most common encountered was of mixed type involving both soft tissues and skeletal injuries and accounts for 62.98% involving the middle and lower third of the face including mandible as depicted in Table no.3..

**TABLE 3: SHOWING RELATION BETWEEN TYPE OF INJURY CAUSED DUE TO VARIOUS ETIOLOGICAL FACTORS.**

TYPE OF INJURY	TRAUMA CASES		ACCIDENT ROAD TRAFFIC		HEIGHT FALL FROM		PHYSICAL ASSAULT		BEAR SLAP		GUN SHOT INJURY		OTHERS	
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
SOFT TISSUE ONLY	29	16.02	23	24.47	5	19.23	6	27.27	14	77.78	1	11.11	4	33.33
SKELETAL ONLY	38	21.00	0	0	3	11.54	2	9.09	0	0	0	0	1	8.33
MIXED	114	62.98	71	75.53	18	69.23	14	63.64	4	22.22	8	88.89	7	58.34
TOTAL	181	100	94	51.92	26	14.37	22	12.16	18	9.94	9	4.98	12	6.63

Zygomatic fracture was the most common one followed by Maxilla, Nasal bones & Frontal bone i.e LE FORT III was the commonest type of maxillary fracture followed by LE FORT II and LE FORT I. In our study 22 cases had undergone tracheostomy for the airway management, Pain & difficulty in chewing was the commonest symptom followed by Cerebral concussion and Nasal bleeding. Out of 181 cases, unfortunately three patient died due to hypovolummic shock and in other cases conservative management with surgery in form of fracture reduction and soft tissue reconstruction was done as required depending upon the requirement of injury.

**DISCUSSION:**

In our study we found Road traffic accidents to be the commonest cause of Maxillofacial injury i.e in 51.92% of cases, followed by Fall from height in 14.37%, Physical assault in 12.16% of cases and our findings of RTA as the commonest etiological factor tally with various other studies<sup>10,11,12,13,14,15</sup>. We found Physical assault to be equally important etiological factor as Fall from height and similar results were obtained by Nakamura & Gross<sup>16</sup>. Fall from height accounts for 14.37% of cases of MFT forming the second largest group.

The most common age group involved was 21-30 years i.e 23.20% and 31-40 years i.e 20.99% with more predominance between 21-35 years and our age group involved in MFT correlate with the age group of 15-33 years in the studies<sup>13,14,15,16,17,18,19,20,21</sup>. The highest of this age group is due to the fact that this age group is more commonly involved in Physical assault, Violence, High speed transportation, Addictions, Sports & leisure activities etc.

With respect to sex distribution, males were affected more i.e 126 cases (69.61%) then females which comprises of 55 cases (30.39%) with male to female ratio of 2.29:1 and similar results of male predominance was also noted by Gussack et al.<sup>22</sup> which showed the male preponderance of 76.83%. Male to female ratio varying from 2:1 to 4:1 was also reported by other

authors<sup>17,18,19,21,23,24</sup> and tally with our result of 2.29:1.

The high percentage of males involvement in MFT is due to their more involvement in addictions, high speed transportation, peer pressure, sports, assaults, violence etc.

Road traffic accidents were mostly reported from National highway and were usually high speed trauma. Cases of Fall from height, Physical assault, Gun shot injury, Bear slap, Violence were mostly reported from nearby villages and Work place accidents were mostly reported from industrial area of Muzaffarnagar.

In our study middle and lower face was most most affected area in trauma which is in accordance with Shephard et al.<sup>25</sup>

In our study Mixed type of injury (involving both soft tissue & skeletal components) was most commonly noted i.e in 114 cases (62.98%) followed by skeletal injuries in 38 cases (21.00%) and only 29 cases (16.02%) were reported of involving the soft tissue component singly, which is opposite to the results obtained by Karyouti<sup>26</sup> as he noted mixed type of injury in only 23.70% of cases, skeletal injuries in 37.90% and soft tissue injuries in 38.90% of cases. The high percentage of mixed type of injury in our study is attributed to the RTA's which were managed by surgical intervention in form of fracture reduction under Local anaesthesia or General anaesthesia depending upon the injury extent or cooperation of patient with closure of soft tissue injury, but before doing any surgical interventions Airway, Breathing, Circulation & Vitals were maintained. We performed 22 tracheostomies to secure the airway.

#### CONCLUSION:

Maxillofacial trauma are increasing with increase in outdoor activities, leisure time, sports & recreational activities, physical assaults, violence etc which is taking heavy toll of lives i.e 1-3 every 30 seconds someone dies on the world roads. Annually over one million people die and over 25 millions are injured or permanently disabled due to RTA's so by our study we emphasize the importance of wearing helmets & seat belts while driving, protective measures while working with machines, should refrain from alcohol while driving or handling machines, follow traffic rules & should strict to prescribed speed limit. The Govt. should encourage the youths by the following slogans on roads at regular intervals.

**"SPEED THRILLS BUT KILLS"**

**"IT IS BETTER TO BE LATE THEN NEVER"**

**"DO NOT MIX DRINKING & DRIVING"**

#### REFERENCES:

- Rishi Bali, Praveen Sharma, Amandeep Garg, Guneet Dhillon : A comprehensive study on Maxillofacial trauma conducted in Yamunanagar : Journal of Injury and violence research; 2013 Jul.; 5(2); 108-116.
- Lee, Hyun-woo, Yu-Jin : A clinical study of the oral and maxillofacial fracture : J. of Korean Dental Science; Vol.2 issue 1, 2009, Pg 31-38.
- Adams WM & Adams LH : Internal wire fixation of facial fractures : Am. J. Surg. 1956; 92; 12-17.
- Becky L, McGraw, Randolph R, Cole : Paediatric maxillofacial trauma; Age related variation in injury : Arch Otol Head Neck Surg 1990; 116:41-5.
- Brown JB, Mc Donnell P : Internal Wire Pin- Fixation For Fracture Of The Jaw. Gynaecol Obstet 1942; 74:227.
- Braunstein PW : Medical Aspects of Automotive Crash Injury Research. JAMA 1957; 163:249-55.
- Brook IM, Wood N : Aetiology and incidence of facial fractures in adults. Int J Oral Surg 1983; 121:293-8.
- Robert B. Stanley : Maxillofacial trauma : Otolaryngology – Head & Neck Surgery, Second edition, 1993; Vol.1; Pg 374-402.
- Vinod Kapoor : Injuries of the maxillofacial region : Textbook of Oral and Maxillofacial Surgery : Second edition, 7th reprint 2010; Pg. 222-318.
- Schultz RC : One thousand consecutive cases of major facial injury : Rev. Surgery 1970; 27:394.
- McCoy FJ, Chandler RA, Magnan CG, Moore JR, Siemsen G : An analysis of facial fractures and their complications : Plast Reconstr Surg 1962; 29: 381-91.
- Melmed EP, Koonin AJ : Fractures of mandible a review of 909 cases : Plast Reconstr Surg 1975; 56:323-7.
- Van Hoff RF, Merck CA, Stokelariburg EC : The different patterns of fractures of facial skeleton in four European countries. Int J Oral Surg 1977; 6:3-11.
- Olsan RA, Fonseca RJ, Zeitler DL, Osbon DB : Fractures of mandible. A review of 580 cases. Am Assoc Oral Maxillofacial Surg 1982; 23:8.
- Srivastava D, Srivastava JL : Maxillofacial injuries. A retrospective study of 576 cases. Ind J Plast Surg 1989; 22:36-9.
- Nakamura T, Gross GW : Facial fractures - Analysis of 5 years of experience. Arch Otolaryngol 1973; 97:288-90.
- Gwyn PP, Cairway JH, Horton CE, Adamsion JE, Maladick RA : Facial fractures- Associated injuries and complications. Plast Reconstr Surg 1971; 47:225-30.
- Luce EA, Tubb TD, Moore AM : Review of 1000 major facial fractures and associated injuries. Plast Reconstr Surg 1979; 63: 26-30.
- Anderson L, Hultin M, Norderm A, Ramastrom G : Jaw fractures in the country of Stockholm (1978-80). Int J Oral Surg ; 1984; 13:19419U4-99.
- Thorn JJ, Mogeltoff M, Hansen PK : Incidence and aetiological pattern of jaw fractures in Greenland. Int J Oral Maxillofac Surg 1986; 15:372-9.
- Scherer M, Sullivan WG, Smith DJ, et al. : An analysis of 1,423 facial fractures in 788 patients at an urban trauma centre. The Journal of Trauma 1989; 3:288-90.
- Gussack GS, Lutermin A, Powell RW, Rodgers K, Ramenoisky ML. Paediatric maxillofacial trauma - Unique features in diagnosis and treatment. Laryngoscope 1907; 97:925-30.
- Rowel NL, Killey HC. Fractures of the facial skeleton. In edn. 2, London, Livingstone; 1968.
- Lamberg MA : Maxillofacial fractures : Proc Dental Society 74, Suppl VII 1978.
- Shepherd JP, Kotany A, Subadan C, Sculley C : Assault and Facial soft tissue injuries. Br J Plast Surg 1987; 40:614-9.
- Karyouti SM : Maxillofacial injuries at Jordan University Hospital. Int J Oral Maxillofac Surg 1987; 16:262-5.