

MAXILLOFACIAL INJURIES- AN EIGHT-YEAR STUDY OF 206 PATIENTS

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ABSTRACT

BACKGROUND

The aim of our study is to evaluate the incidence and aetiology of maxillofacial injuries in the Department of Plastic Surgery, Srinagar, Kashmir.

MATERIALS AND METHODS

The study consisted of 206 cases with maxillofacial injuries who were brought to SKIMS, Soura, Srinagar, between January 1985 to December 1992.

Parameters such as gender, age, aetiology, soft tissue injury & type of fracture were evaluated.

RESULTS

Results of this study show that missile injuries are the main cause for maxillofacial injuries followed by RTA, falls and bear bites.

MF injuries were more common in adult males than females.

The most common type of facial fracture was mandibular fracture, followed by maxilla & zygoma fractures.

CONCLUSION

Maxillofacial injuries were commonly seen in adult males, due to missile involving mandible, maxilla & zygoma.

KEYWORDS

Maxillofacial Injuries, Missile Injuries, Road Traffic Accidents, Fractures.

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BACKGROUND

Missile injuries have attracted the attention of humanity since the time of Hippocrates (460-370 BC) who outlined the principles of treatment. Sushruta known as father of Indian Plastic Surgery described an array of facial injuries and performed a rhinoplasty, the oldest plastic surgery operation in 600 BC.

While the nature has protected the brain with a complete helmet of thick bones of great strength, the bony areas of face concerned with vision, taste, smell, mastication breathing, speech and beauty are most fragile. These functions are severely affected and ultimately result in poor qualities of life in survivors.

Human fatal inclination for High speed and interpersonal conflicts has increased the volume of injured victims. Injuries of jaw and face are among the most frequent injuries seen in many emergency rooms. Today the common causes of trauma resulting in maxillofacial injuries

are RTA, falls and assault. Maxillofacial injuries occur both in war and peace. Heavy industrialization and missile injuries have also resulted in increase of such injuries. As the number of high speed accidents increase, so does the complexity of injuries. Violent accidents bring concomitant soft tissue injuries and prove to be fatal due to their serious complications or associated skull, brain and cervical injuries. Maxilla fractures caused by gunshot wounds are main serious than mandibular fracture because of high incidence of associated damage to the brain or meninges or to the contents of orbit.

In spite of many excellent contribution by the forerunners in this field, facial traumatology will continue to be the highly specialized field of the healing art; demanding an ever-increasing ingenuity and cooperative efforts as the part of the involved surgeons. In the treatment of these injuries, appearance and functions must be restored to the face and this necessitates the replacement of the tooth bearing areas into normal occlusion.

With the increase in the incidence of road traffic accidents and missile injuries in Kashmir valley, there has been a concomitant increase in the occurrence of facial injuries. This study was undertaken to study the clinical profile of such patients in the Kashmir Valley.

This analytical study assessed the aetiology, type of fracture, soft tissue injury besides age, sex of such maxillofacial injuries brought to our plastic surgery

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department of SKIMS Soura during 8 years (from January 1985 to December 1992).

MATERIALS AND METHODS

This study was carried out in the plastic surgery Department of SKIMS Srinagar (Kashmir). This study although at present is retrospective –but at end of study in 1992 included both retrospective and prospective analysis of maxillofacial trauma cases. The patients included in this study were those admitted directly to hospital and those who were referred from other hospitals in the Kashmir. The study includes 206 patients admitted since January 1985 to December 1992.

Retrospective Group

Data obtained retrospectively as per the attached proforma from all case histories of patients admitted for treatment on in patient's basis during January 1985 to July 1991.

Prospective Group

All the cases of maxillofacial injuries admitted for treatment during the course of study i.e. from August 1991 to December 1992.

Initial Assessment

On arrival in accident and emergency department – All patients were adequately evaluated for presence of associated head, abdomen and chest injuries. At this stage attention was paid for airway haemorrhage and vitals.

Detailed history was taken and practical included time of injury, age, sex cause of trauma and associated injury. All cases were allocated to 8 different groups of aetiology – 1. RTA 2. Assault 3. Fall 4. Missile Injury- including gunshot wounds & blast Injuries 5. Bear bites 6. Dog bites etc., Thorough clinical examination was done to evaluate the number and anatomical site of fracture, soft tissue injuries and associated injuries. MF Injuries were divided into three categories- No 1 soft tissue Injuries only 2. Soft tissue injuries with fracture 3. Fracture only. Patients having minor injuries and those who were brought dead to hospital were excluded from study

RESULTS

In this study almost for every 349.16 hospital admissions, 1 patient of MF Injury was admitted (Table 1)

Total Hospital Admission	90467
Maxillofacial	206
Percentage of MF Injuries	0.23

Table 1. Percentage of MF Injuries

The ratio between male and female was 3.2:1 (Table 2)

Gender	Number of Cases (%)
Male	152 (173.79)
Female	54 (26.21)

Table 2. Gender (n=206)

Maximum no of patients 72 (34.95%) were found in age group of (21 to 30 years), followed by 11 to 20 years (18.93%). The least common group involved was above 60 years (0.3%). Youngest patient was 2 years old. (Table 3)

Age Group	Number of Cases (%)
0-10	26 (12.62)
11-20	39 (18.93)
21-30	72 (34.95)
31-40	38 (18.45)
41-50	20 (9.71)
51-60	08 (3.88)
>60	03 (1.46)

Table 3. Age Group (n= 206)

Missile Injuries were the commonest etiological factor (32.52%), followed by RTA (26.7%), falls 18.93% & bear bites 10.19%, while home accidents were the least common (0.49%). Majority of RTA were due to scooter accidents 34.55%. Out of 39 case of fall 20 were due to fall from walnut trees. In children majority of falls were as a result of fall from windows (Table 4)

Mode of Injury	Number of Cases (%)
Missile Injuries	67 (32.52)
Road Traffic Accidents	55 (26.70)
Falls	39 (18.93)
Bear Bites	21 (10.19)
Assault	14 (6.80)
Others	
Dog Bites	06 (2.91)
Industrial Accidents	03 (1.46)
Home Accidents	01 (0.49)

Table 4. Aetiology (n=206)

For the first time 4 cases of Missile Injuries were reported in 1989. No of such injuries went on increasing up to 29 cases in 1992. (Table 5)

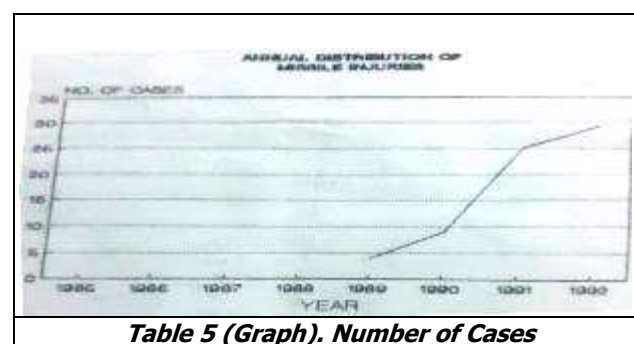


Table 5 (Graph). Number of Cases

Annual Distribution of Missile Injuries

Mixed injuries involving soft tissue and bone fractures were commonest (60.68%), followed by bone injuries only (21.36%) and soft tissue injuries only (17.96%) (Table 6)

Type of Injuries	Number of Cases (%)
Soft Tissues and Bones (Mixed)	125 (6.68%)
Bone Only	44 (21.36%)
Soft Tissues Only	37 (17.96%)
Table 6. Types of Injuries (n=206)	

46 patients (86.39%) had single fractures and 23 (13.60%) had multiple fractures. Multiple fractures included 21 double and 2 triple fractures (Table 7)

Single / Multiple Fractures	No. of Patients (%)	Total No. of Fractures
Single Fractures	146 (86.39%)	146
Double Fractures	21 (12.42%)	42
Triple Fractures	02 (1.19%)	06
Table 7. Single / Multiple Fractures (n=194)		

Mandibular fractures were the commonest 87 (44.85%) followed by Maxilla fractures 30 (15.46%), Zygomatic fracture 27 (13.92%), Nasal fracture 27 (13.92%), Frontal fracture 15 (7.73%) and blow out fractures 8 (4.12%) (Table 8)

Type of Fracture	Number of Cases (%)
Mandibular	87 (44.85%)
Maxilla	30 (15.46%)
Nasal	27 (13.92%)
Zygomatic Complex	27 (13.92%)
Frontal	15 (7.73%)
Blow out	08 (4.12%)
Table 8. Fracture Injuries Different Bones 194	

The most common site of fracture in the mandible was body (31.54%) followed by symphysis and para symphysis (23.85%), 20% fractures of ramus. Among maxillary fractures Le fort III fractures were commonest fractures (40%) followed by Le fort II (36.67%) and Le fort I (20%) (Table 9).

Site	No. of Fractures (%)
Le fort 1	06 (20.00%)
Le fort 2	11 (36.67%)
Le fort 3	12 (40.00%)
Midline	01 (3.33%)
Table 9. Maxilla Fractures	

Associated injuries were found in 124 patients (60.19%). Most common associated injuries with MF injuries were cranio cerebral trauma 44 (2.35%). Second commonest associated injury was blindness in 21 patients (10.196%). In 6 patients blindness was bilateral.



Figure 1



Figure 2



Figure 3

**Figure 4****Figure 7****Figure 5****Figure 6**

DISCUSSION

In the present study, the incidence of MF injuries was found to be (0.23%) of total hospital admissions. Nakamura & Grass¹ reported that operations for facial fractures comprised of 2% of total operative procedures. The incidence of Jaw fractures reported in green land by thorn et al² was 17% per 10, 000 populations per year (0.17%). The low incidence in our study was because of fact that all our patients were hospitalized ones and represented more severe injuries.

In our series there were 152 (77.78%) males and 54 (26.22%) females, comprising a male to female ratio of 3.2: 1. The sex distribution of MF trauma on a national and international level has shown 67% to 83% male dominance.³ A male to female ration varying from 2/1 to 4/1 were reported by other international studies.^{4,5} Other regions of world reported similar prevalence.^{6,7,8}

The higher% of males in our study could be attributed to fact that men are mostly involved in outdoor activities, rash driving and also exposed to violent interactions while females deal with house hold work and remained confined to indoors only.

The most common age group involved in this series was 21-30 years (34.95%) followed by age group of 11-20 years (18.93%). The highest incidence of 21-30 years age group may be due to their involvement in travelling to work places, outdoor activities, fights, and high speed transportation. This correlates with the observations made by other authors that most victims of facial injuries are young adult males in age group of 15-35 years.^{9,10,11,12}

In present study Missile injuries were found to be commonest etiological factor (32.52%) followed by RTA 26.70%. In another study automobile accidents were found to be commonest cause.^{13,14} Nakamura & Grass¹ attributed 59% of cases to intended violence and only 17% to automobile accidents. Missile accounted for most of MF injuries in our series. Before 1989 automobile accidents ranked commonest cause of facial injuries and not a single case attributed to gunshot wounds. Since 1989 the no of missile injuries increased resulting into a corresponding increase of MF injuries. Clarkson et al¹² has reported in (1946) that 3, 000 cases of MF injuries in victims in 2nd world war resulting

from missile injuries. In another study gunshot wounds have been reported as cause of MF injuries in 10% and 6.1% of patients respectively.^{15,16} Gunshot wounds of face and jaws are inflicted by a variety of Missiles ranging from small particles of fragmented mortar bombs or high velocity bullets to comparatively large parts of grenades or shells. Rob¹⁶ quoted by Porritt (1953) analysed a series of MF wounds resulting from missile and found 75% cases were due to fragmentation missiles (mortar, aerial bombs, grenades, shells), 10% due to penetrating solid missile bullets. The relative frequency of various missile injuries in present series was 82.08% due to bullets and 17.92% due to grenades and shells. Our study also included 21 (10.19%) of MF injuries resulting from bear bites

In contrast to study performed by Sibers et al 2015¹⁷ where fall from height was the most common cause of MF injuries, we found Missile injuries as leading cause in our study. our study shows that most common cause of facial injury was missile which is in contrast with the observations of other studies in India and also other countries.^{18,19} In our study out of 39 cases of fall from height, 20 cases were due to fall from walnut tree-which attributed to lack of training to climb trees

Distribution of facial fractures Mandibular fracture were most common (44.85%) followed by maxilla fracture (15.46%), Zygomatic (13.92%), nasal fracture (13.92%) of hospitalized admissions. This is in agreement with previous studies.^{4,10,11,20,21,22} Similar to our study Motamedi et al also found higher no of Mandibular fractures (72.9%), Zygomatico orbital 24.0%, maxillary 13.9%. In contrast to our study, other studies found zygomatic fractures most common.^{9,13}

Nasal and Zygomatic fractures were seen less often in our study than expected because many simple nasal fractures were managed in outpatient basis. In contrast to our study, nasal bone fractures were commonest facial fractures in many previous studies.^{1,23}

In present series commonest site of Mandibular fracture was body (31.54%), followed by symphysis and para symphysis in (23.85%). In our study Le fort III level fracture were the commonest of (40%) of Maxilla fractures.

Associated injuries were found in (60.19%) of cases. Most common associated injuries were craniocerebral trauma (21.35%). It was attributed due to lack of safety measures such as not wearing a helmet during driving and rash driving.

According to WHO estimates nearly 25% of all worldwide injury fatalities are due to road traffic crashes and 90% fatalities occur in low and middle income countries.²⁴

RTA is one of major causes of death in India. The majority of accidents due to rash driving and violation of traffic rules. Fatigue is another important factor for road accident especially in commercial vehicle drivers who drive very long distance. Similar to study of other parts of India we found two wheeler drivers and pedestrian most common victims of MF injuries due to RTA.²⁵ Bad road conditions, rash driving, ignoring traffic rules are some mistakes which lead to RTA.

In contrast to the study of other parts of India and world-wide missile injuries were commonest etiological cause in our study. This attributes to increase number of Army & police in Kashmir and increased incidence of conflicts between people and army in these years where common people are the victims.

CONCLUSION

Maxillofacial injuries are more common in males than in females. Majority of patients were found in the age group of (21-30 years)

The results of this study show that missile injuries are the main etiological factor of MF injuries followed by RTA, falls and bear bites. Among fall cases, majority of patients had fall from walnut trees. Mixed injuries involving soft tissues and bone fractures were commonest followed by bone injuries only.

Mandible # were the commonest followed by maxilla #. Majority of patients had single #, followed by multiple #. RTA were the commonest cause of multiple #. Most common site of mandible # was body. Among maxillary # Le fort 3 was the commonest. Most common associated injury was Craniocerebral Trauma. Second most common associated injury was blindness. Negotiations and peace talks should prevail to end conflicts as such conflicts are cause of missile injuries in valley.

Safety measures to prevent such injuries in developing countries must be based on local evidence based research.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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