

Concomitant Injuries associated with maxillofacial trauma- A Retrospective Study

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Abstract

Maxillofacial injuries lead to significant aesthetic and functional impairment, financial burden and rarely, life threatening consequences. Patients with maxillofacial trauma commonly present with other concomitant injuries.

AIM: The purpose of this study is to study the epidemiology of maxillofacial trauma with respect to concomitant injury, etiology, sex and site.

Materials and Methods: This is a retrospective study in which records of 400 consecutive patients with maxillofacial injuries reporting to the emergency department of Justice K.S. Hegde Medical Hospital were included. The main study variable was concomitant injury. Secondary variables were age, gender, etiology and the type and site of fracture. Any injury that occurred outside the maxillofacial region was considered as concomitant injury.

Results: Road traffic accidents were the most common mechanism of trauma. The most common age group involved was that of 21 to 40 years. The most common facial injury noted was soft tissue injury. Of the facial fractures zygomatic fractures were the most common.

Associated injuries were seen in 35% of the individuals. Of the associated injuries the most common injuries noted were that of the upper limb. Of all the subjects, 26.3 % had an associated injury along with maxillofacial trauma and 9.3% of individuals had more than one associated injuries.

Conclusion: While maxillofacial injuries are rarely life-threatening, the concomitant injuries especially that of the brain and the abdomen can often be inconspicuous and life-threatening. This awareness is mandatory amongst maxillofacial surgeons. Our study highlights the importance of training of maxillofacial surgeons in primary care so as to perform an efficient triage

Keywords: Maxillofacial injuries, concomitant injuries, associated injuries, primary management.

Introduction

Maxillofacial trauma consists of a significant portion of trauma worldwide. There exists a considerable variability in the incidence and etiology of maxillofacial trauma depending on the region, culture and socioeconomic status throughout the world. . Maxillofacial injuries lead to significant aesthetic and functional impairment, financial

burden and rarely, life threatening consequences. Patients with maxillofacial trauma commonly present with other concomitant injuries. A number of studies have been conducted showing the association of facial injuries with cervical injuries.[3][4]Kloss et al in study of 1959 cases have shown that 2.8% of the neurologically normal appearing patients present with intracranial hematomas.[5] Association of other organ systems such as limbs, abdomen, chest have also been studied.[2, 6] There also exist a number of studies exclusively describing concomitant injuries with a particular type of facial fracture. [7]The purpose of this study is to study the epidemiology of maxillofacial trauma with respect to concomitant injury, etiology, sex and site. This is the first ever study done in the dakshina kannada district. A detailed awareness of this epidemiology will allow a better perspective in terms of early and late management and preventive strategies to avert catastrophes.

Materials And Methods

Source of the Data: This is a retrospective study in which records of 400 consecutive patients with maxillofacial injuries reporting to the emergency department of Justice K.S. Hegde Medical Hospital were included.

Methodology

Study Variables: The main study variable was concomitant injury. Secondary variables were age, gender, etiology and the type and site of fracture.

Any injury that occurred outside the maxillofacial region was considered as concomitant injury. Abrasions were excluded from the study. The sites of concomitant injury were classified as:

1. Upper limb
2. Lower limb
3. Abdomen
4. Spine
5. Chest

6. Brain
7. Eye
8. Cranial bones [except frontal bone which was included in the maxillofacial region]

The etiology were classified as Road traffic accidents, fall from height, assault, hit by an object and others.

Maxillofacial injuries were divided into soft tissue injuries [excluding abrasions] and fractures. Fracture site was further subdivided into:

1. Fracture of Maxilla [including Lefort I, II , III]
2. Fracture mandible symphysis
3. Fracture mandible parasymphysis
4. Fracture mandibular body
5. Fracture mandibular angle
6. Fracture mandibular condyle
7. Fracture mandibular subcondylar
8. Fracture mandibular coronoid
9. Zygomatic fractures [including zygomatico-maxillary complex, zygomatic arch]
10. Isolated nasal bone fracture
11. Isolated Orbital fracture
12. Isolated frontal bone fracture.
13. Isolated dentoalveolar fractures

Data Analysis

The total incidence associated injuries amongst the 400 subjects was evaluated. The difference in the incidence of associated injuries between gender, etiology and type of facial fractures was evaluated.

Results

A total of 400 consecutive patients reporting to emergency department of Justice K.S. Hegde Medical Hospital were evaluated Of these, 80.9% were males and only 19.1% were females.

The most common age group involved was that of 21 to 40 years.

Road traffic accidents were the most common mechanism of trauma [60.3%], followed by fall from height [29%], assault [5.3%], others [3%] and hit by an object [2.5%].

[Fig 1].

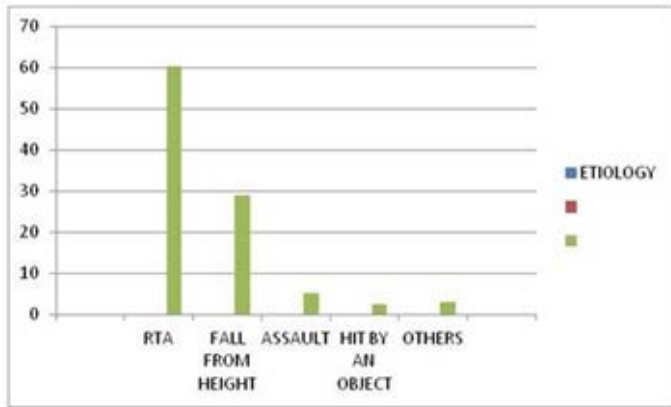


Fig 1 demonstrates the various causes of trauma in our study

The most common facial injury noted was soft tissue injury [93%]. 14.8% of individuals presented with facial fractures. Of the facial fractures zygomatic fractures were the most common followed by 36.6%. 10.3% of individuals suffered from a single facial fracture, while 4.6% suffered from multiple facial fractures. (Table 1).

Facial Injury	Present	
	N	%
FACE-soft tissue	367	92.2
Fracture maxilla	9	2.3
Fracture parasymphysis	8	2.0
Fracture body	4	1.0
Fracture condyle	3	.8
Fracture coronoid	1	.3
Fracture angle	1	.3
Fracture subcondylar	3	.8
Fracture Zygomatic bone	17	4.3
Fracture Orbit	5	1.3
Fracture Nasal bone	12	3.0
Fracture frontal bone	2	.5

Fracture dentoalveolar	7	1.8
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Table 1: showing the frequency of involvement of various bones of the maxillofacial skeleton

Associated injuries were seen in 35% of the individuals. Of the associated injuries the most common injuries noted were that of the upper limb. (Table 2) (Fig 2)

Associated Injuries	Present
Hand	50[12.5%]
Leg	43[10.8%]
Chest	9[2.3%]
Abdomen	6[1.5%]
Spine	12[3.0%]
Brain	41[10.3%]
Cranial bones	5[1.3%]
Eye	16[4.0%]

Table 2: showing the various forms of associated injuries that were seen along with maxillofacial trauma.

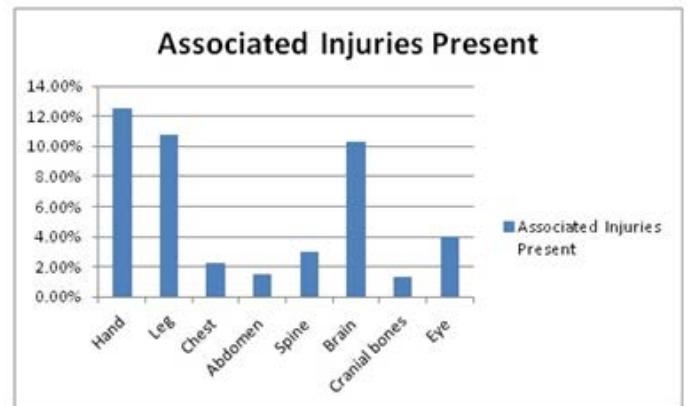


Fig 2 showing the various forms of associated injuries that were seen along with maxillofacial trauma.

Of all the subjects, 26.3 % had an associated injury along with maxillofacial trauma and 9.3% of individuals had more than one associated injuries. (Table 3)

Associated condition	Frequency	Percent
Absent	258	64.5

One associated condition	105	26.3
More than One associated condition	37	9.3
Total	400	100.0

Table 3: showing the frequency of one or more associated conditions if any.

Discussion

Amongst the patients with maxillofacial trauma a majority was male [80.8%] while only a [19.3%] were females. This finding was similar with the findings of a majority of the studies done in terms of maxillofacial trauma. Men being more involved in cases of assaults and motor vehicle accidents could be a justification of such finding.

The most common etiology of trauma was road traffic accidents. This finding was similar to a vast majority of studies done in UAE, UK, Greece. [2,8,9] However in a study by Thoren et al in Switzerland,[6] assault was found to be the most common cause of trauma. This could be due to a better traffic legislation in this area as compared to the others.

The most commonly involved age group was 20-30 years. This finding is similar to that seen in a variety of other studies on maxillofacial injuries. [1, 2, 4, 8]

Soft tissue injuries were found in 92.2 % of individuals. Soft tissue injuries are one of the most common presentations of maxillofacial trauma. Our finding was in accordance with those of a study performed by Hussaini et al in Malaysia where the incidence of soft tissue injuries was 94%.[10]. Severity of maxillofacial is often gauged with the presence or absence of fractures. However, soft tissue injuries can often be one of the most common causes of functional and aesthetic morbidity. Management of soft tissue injury is best done in the initial phase as soon as the patient is brought to the emergency department, once the life threatening conditions are ruled out. This finding highlights the importance of optimum

management of soft tissue injuries so as to have minimal morbidity at a later date.

Facial fractures were found in 14.8 % of individuals. Zygomatic fractures were the most commonly involved bone [36.6%] followed by nasal bone and dentoalveolar fractures. [1.6%]. In the majority of studies, mandible was the most commonly fractured bone of the face followed by the zygomatic bone. [1, 2, 6, 8, 9]. Approximately 10.3% of the patients had a single bone fractured while around 4.6% suffered from fractures more than one facial bone.

Associated injuries were found in 141 individuals out of 400 [35%] with a total of 182 injuries. With maxillofacial trauma. van Hout et al[1] and Kostakis et al[2] have reported a similar incidence of associated injury as 36% and 30% respectively. Of these, upper limb injuries were the most common [12.5%] followed by lower limb injuries [10.8%]. There seemed to be a significant relation between zygomatic bone fractures and brain injury. [p value=0.017]

The overall incidence of brain injury was 10.3%. This rate was in a similar range but slightly higher than those observed by Thoren et al[6] [11%], Brasileiro and Passeri[11][10.5%] and Hohlreider et al[12] [9.7%]. 14% of the patients with facial fractures had brain injury.

Conclusion

Maxillofacial trauma is often associated with concomitant injuries. While maxillofacial injuries are rarely life-threatening, the concomitant injuries especially that of the brain and the abdomen can often be inconspicuous and life-threatening. This awareness is mandatory amongst maxillofacial surgeons. Also a multidisciplinary practice with collaboration with other medicos such as orthopaedicians, general surgeons and neurosurgeons is mandatory. Our study highlights the importance of training of maxillofacial surgeons in primary care so as to perform an efficient triage by recognising signs and

symptoms of injuries in other body parts and organs. Satisfactorily treating the maxillofacial injury without overall management of the patient is synonymous to an untreated patient.

Informed consent : Since this a retrospective study, formal consent is not required.

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