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A DESCRIPTIVE STUDY OF FRACTURES DISTRIBUTION IN FACIOMAXILLARY TRAUMA IN KUMAON REGION

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ABSTRACT: OBJECTIVES: To determine the, mode of injury, location, age and sex distribution involving the various bones of facio-maxillary region seen during the time period between October 2012 to October 2014 at Dr. Susheela Tiwari Memorial Hospital, Haldwani, Uttarakhand. **MATERIALS AND METHODS:** This is a descriptive study of the patients with alleged isolated maxillofacial injury presenting in the Emergency, ENT & HNS OPD and Dentistry OPD of Dr. Susheela Tiwari Memorial Hospital, Haldwani. **RESULTS:** Most patients were in the age group 11-20 and 21-30 years with 20 and 36 patients respectively as consistent with the other studies. This study also showed a male preponderance accounting for 80.77% of the case load. The most common mode of injury in patients presented to the Emergency Department with faciomaxillary trauma was road traffic accidents, comprising 79.49% of cases. Assault and fall from height were the other causes, comprising 11.54% and 8.97% respectively. **CONCLUSIONS:** Reliable epidemiological information on facio maxillary trauma is essential for decision making in the emergency, for identifying factors that increase the risk of injury and for providing targets for preventive measures. Multi detector CT is the investigation of choice for evaluation of faciomaxillary trauma. 3D images are useful for complex fractures involving the face. As there is no additional scanning or risk of radiation involved, 3D Virtual Reality Images and Multi Planar Rendering (MPR) is a valuable tool for radiologists for reporting/interpretation of faciomaxillary trauma.

KEYWORDS: MDCT, MPR.

INTRODUCTION: Maxillofacial trauma presents as isolated injury or part of polytrauma and are clinically important as the disruption of soft tissues and bones of the face cause facial asymmetry and disfigurement which causes emotional and cosmetic concerns. The region is also associated with several important functions of daily living.¹ Fractures involving the facial skeleton may be isolated or complex. Isolated fracture involve single anatomical structure and are usually a result of a low energy blow.² The radiographic evaluation of patients presenting with facial trauma can at time be confusing and frustrating for several reasons these include⁽³⁾:

1. A complex nature of the normal radiographic facial anatomy.
2. Difficulty in obtaining optimal diagnostic films because of the patient's physical condition and/or inability to co-operate.

Failure to adequately correlate clinical with radiographic findings.

Despite a higher radiation dosage compared to conventional radiography, CT is the imaging modality of choice to display the multiplicity of fragments, the degree of rotation and displacement or any skull base involvement.⁴ The continuous data acquisition integrate the image of the entire volume of interest on the scanner. Consequently, it is possible to scan rapidly a large volume of

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interest with high image quality, thin sections, and a low artifact rating in short time, thereby dramatically reducing respiratory motion problems.^{5,6}

AIM OF STUDY: To determine the mode of injury in faciomaxillary trauma. To determine the age and sex distribution in faciomaxillary trauma.

Inclusion Criteria: All patients with isolated faciomaxillary injuries irrespective of Sex/Age/Religion.

Exclusion Criteria:

1. Patient with bleeding disorders.
2. Patients arrived dead.
3. Patients died within 24 hour.
4. Patient with head injury
5. Pregnant females.
6. Patient with polytrauma.
7. Patients unwilling to participate in the study.

Duration of Study: October 2012 to October 2014. Detailed history and examination of the patients done as per prepared proforma.

Special Investigation: CT Scan, ?? Orthopantogram, x-ray face, CT head, USG abdomen all patients with isolated maxillofacial fractures were assessed by analyzing axial images and also with 3D reconstructed images and coronal MPRs, x-ray face as needed.

RESULTS: Age Distribution of Patients in the Study: In this study group which comprised of a total number of 78 patients, the age at presentation ranged from 03 to 65 years. Most patients belonged to the 21 -30 age groups and 11—20 age groups with 46. 15% and 25. 64% patients respectively.

Age Group	Numbers	Percentages
0-10	2	2. 56
11-20	20	25. 64
21-30	36	46. 15
31-40	15	19. 23
41-50	3	3. 85
51-60	1	1. 28
61-70	1	1. 28
71-80	0	0. 00
81-90	0	0. 00
Total	78	100
Table 1: Age distribution		

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Fig. 1: Percentage of people having faciomaxillary fracture in particular age group.

Fig. 1

Sex Distribution of Patients Studied: There were 63 males and 15 females in the patients included in the study group. Males comprised 80.77 % and females comprised 19.23 % of the group.

Sex	No. of Facial Fracture	Percentage
Male	63	80.77
Female	15	19.23
Total	78	100

Table 2: Sex Distribution

Fig. 2: Pie chart depicting the relative percentages of males and females in the study group.

Fig. 2

Mode of Injury: The most common mode of injury in patients presented to the Emergency Department with maxillofacial trauma was road traffic accidents, comprising 79.49% of cases. Assault and fall from height were the other causes, comprising 11.54% and 8.97%, respectively.

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Mode of Injury	No. of Fracture	Percentage
RTA	62	79.49
Assault	9	11.54
Fall From Height	7	8.97
TOTAL	78	100

Table 3: Mode of Injury

Fig. 3: Mode of injury.

Fig. 3

Type of Facial Bone Fracture: Naso-orbito-ethmoid region noted to be the most common site of fracture (i.e. 64.1% of patients having fracture in this bone.) The maxilla, especially the walls of its sinus was noted to be the 2nd most commonly involved bone with 56.41% of patients. The zygomatic was the next commonly affected region with fractures detected in 50% of patients. Nasal bone & mandible fractures were detected in 39.74% & 30.77% of patients respectively.

Type of Facial Bone	No. of Fracture	Percentage
Frontal	23	29.48
NOE	50	64.10
Zygomatic	39	50.00
Maxillary	44	56.41
mandible	24	30.77
Nasal bone	31	39.74
Sphenoid wing	3	3.85
Temporal	0	0.00
Parietal	0	0.00

Table 4: Type of Facial Bone Fracture

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Fig. 4: Bar Graph showing the different types of Facial Fracture.

DISCUSSION: This study included 78 patients who had a history of maxillofacial injury and was found to have fractures involving the facial bone. The study included the evaluation of these patients with a 16 slice MDCT scanner. The axial images generated were supplemented by the reconstruction of 3D volume rendered images as well as coronal multiplanar reformatted images. The study population consisted of patients in the age group of 03 to 65 years.

Most patients belonged to the 21-30 and 11-20 age groups with 36 and 20 patients respectively. This study also showed a male preponderance accounting for 80.77% of the case load. KIESER et al 80% facial fractures (of all injuries) in males.⁷ The most common mode of injury in patients presented with maxillofacial trauma was road traffic accidents, comprising 79.49% of cases. Assault and fall from height were the other causes, comprising 11.54% and 8.97% respectively.

Many authors reported that traffic accidents were the most frequent cause of facial fractures.^{8,9,10} They found that assault was the second most common cause, although some authors reported that assault was the most common cause.^{11,12} RTA was found to be the most common cause of facial fractures in this study as well.

Assault and fall from height being the other causes of maxillofacial fractures in this study is also consistent with the other similar studies mentioned. Because of social, cultural, and environmental factors, the causes of maxillofacial fractures vary. For example, in a study from Zimbabwe, 90% of the trauma patients were men and 90% of fractures resulted assault from predominantly in the 21 to 25-year age group.¹³

The explanation given for this was that most Zimbabweans do not have motor vehicles. More recent studies have shown that motor vehicle accidents remain the most frequent cause in many industrial countries.^{14,15} These results are consistent with the finding in this study as the hospital is situated in Haldwani and caters to the urban and rural population in the Kumaon region.

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CONCLUSION: Reliable epidemiological information on faciomaxillary trauma is crucial for decision-making in emergency care unit, for identifying factors that increase the risk of injury and for providing measures for prevention. Ideally, such information improves the quality of treatment and helps to achieve measures to prevent injuries and morbidity like in our study. We use epidemiological methods to determine the various significant epidemiological factors like age, sex, mode of injury which potentially help in planning regarding preventive measures, management & rehabilitation of patients. Our study results will help clinicians to better understand maxillofacial trauma.

Further research should be conducted to improvise the study results in other trauma centers and patients. Our study help in earlier treatment and the possible mitigation related to sequelae. Direct and indirect complications of maxillofacial trauma will be minimised. In addition, the study helps to understand best predictive results. The long-term goal of the study was to add knowledge to the area of facial fracture epidemiology, improve detection of facial fractures among trauma patients helping in proper & early management.

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