FREQUENCY OF MAXILLOFACIAL FRACTURES IN PEDRIATIC PATIENTS, PRESENTING WITH TRAUMA TO HAYATABAD MEDICAL COMPLEX PESHAWAR

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ABSTRACT

Introduction: Children with facial trauma have 5% incidence of facial bone fractures. Children having facial trauma differs from their adult counterparts. The physiology and growth of facial bones in children may alter the treatment plans.

Objective: To find out the frequency and patterns of maxillofacial fracture among children presenting to Hayatabad Medical Complex Peshawar.

Materials and Methods: The present descriptive study was conducted at Oral and Maxillofacial surgery department Hayatabad Medical Complex Peshawar. Overall, 159 cases were included in the study from January 2021 till December 2022 using a non-probability consecutive sampling method. Verbal and written informed consent of the patients was taken for their inclusion in study.

Results: Out of the total 159 patients, 109 (68.6%) were males and 50 (31.4%) were females. The mean age of the was 9.4 ± 3.73 SD. Among the facial fractures, dentoalveolar fractures were most commonly seen; in 63 (39.6%) patients, followed by mandibular fracture in 48 (30.2%), nasal bone fracture in 20 patients (12.6%).

Conclusion: Dentoalveolar fracture was most common in pediatric facial fractures. Children of school going age should be counseled regarding preventive strategies e.g. wearing of mouth guards and other protective devices during play time. Children and their parents or guardians should receive proper training in taking preventive measures

Keywords: Pediatric facial fractures; patterns of maxillofacial fractures; Dentoalveolar fractures

INTRODUCTION

Face is the most important region of the body. Injuries to the maxillofacial region may be life threatening mainly due to obstruction of the airway or in some cases severe hemorrhage.[1]

Insults to the maxillofacial bones are infrequent in children.[2] Maxillofacial fractures in children represent 15% of all pediatric facial fractures.[3]

Pediatric facial bones absorb more force than the cranium due to children's low face-to-head volume ratio. The higher elasticity, lack of sinus pneumatization may lead to lesser chances of bony fractures in children. Young children are usually cared by parents or guardians and are more protected than the adults for getting injured.[4] In addition, fractures in children tend to be minimally displaced due to the aforementioned factors[3].

The pattern of maxillofacial trauma varies around the globe. This variation may be due to differences in social, cultural, and environmental factors. In children the etiologic factors vary with age-related activities and exposure, unlike their adult counterparts among whom road traffic accident is the main

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etiologic factor[5]. There is variation in causes for facial fractures in children. Among children less than three years of age, falls are the most common cause of facial fracture. From three to five years of age, road traffic accidents (RTA) and falls are nearly equal. Once children are older than five, motor vehicle accidents become the most common reason [6]. Controversies remain regarding surgical intervention as it may disrupt the growth and lead to an asymmetric face[7],conservative management is mostly adopted if possible, so as to decrease the fixation hardware and to prevent bone growth disruption.[8]

A study by Gondim et al in Brazilian population, fractures of the lower jaw were (80%), and of the zygomatic bone was (15%) and orbital floor fractures (5%). Symphysis (44%) and condyle (38%) were the most affected sites of the mandible's fractures followed by injuries of the body (25%) and angle (13%).[8]In another study of Lim et al, a total of 248 fractures were studied in 156 children; 42 (26.9%) patients having more than one facial bone fracture. Mandible was most commonly involved bone (40.7%), followed by the orbit frame (33.5%) and maxilla was least common 11.7%. Fourteen (9.0%) patients acquired orbital injury and 34 (21.8%) received mandibular fractures [9].

There is not enough data on national level in Pakistan regarding maxillofacial fractures in children. The results of this study will provide us with local statistics which will be compared with those internationally published in literature to identify the future guidelines for prevention and control of maxillofacial fractures in our children. These fractures in paediatric patients tend to have long term sequelae, ranging from disturbed occlusion and tooth malformation in dentoalveolar fractures, growth restriction and, TMJ ankylosis in condylar fractures to aesthetics derangements, and also sensory and functional disturbances, which may have long term physical as well as psychological consequences

Material and Methods

This descriptive study using non-probability consecutive sampling was conducted at the Department of Oral & Maxillofacial Surgery at Oral and Maxillofacial surgery department Hayatabad Medical Complex Peshawar, Pakistan. The necessary approval was obtained from the ethical committee of the same institute. The study included 159 patients with pediatric facial fractures, who were presented from January 2021 till December 2022**.**

Patients with ages below 18 years from both genders; and presentation of fractures within less than one week amongst those that reported to the department of oral and maxillofacial surgery Hayatabad Medical Complex, Peshawar, having a history of oral and maxillofacial trauma; fulfilled the inclusion criteria. While patients presenting with history of firearm injury and with known physical disabilities were excluded from this study.

Patients meeting the inclusion criteria were taken from the ward and OPD of Oral and Maxillofacial surgery. Protocol of the study was explained to the patients for taking an informed written consent. The ethical committee Hayatabad Medical Complex Peshawar reviewed the synopsis of this study for ethical aspect to approve the research protocol and for maintaining confidentiality. A structured proforma was used for gathering information from the patients. Diagnosis of the facial fractures was based on clinical examination and various images like OPG, Occipitomental view, PA view and CT scans; as needed. All the data was obtained by the researcher himself (3rd author) and was supervised by fellow consultant.

The collected data was compiled and analyzed by SPSS version 22. Mean ± standard deviation (SD) was calculated for numeric variables like age of the patients. Frequency and percentage were calculated for categorical variables like gender, age group and patterns of the fractures.

Results

A total of 159 patients were included in the study with 109(68.6%) males and 50(31.4%) females. (Figure 1). The mean age of the patients was 9.4 ± 3.73 SD. There were 43 (27%) patients who were 1-5 years old, 83 (52.2%) patients were 6-10 years, 33 (20.8%) were 11-15 years old (Table 1).

Among the facial fractures, dento alveolar fracture was most common seen in 63 (39.6%) patients, followed by mandibular fractures 48 (30.2%), nasal bone fractures 20 (12.6%), midface fractures 12 (7.5%), ZMC fractures 8 (5%), frontal bone fracture 4 (2.5%) and NOE fractures 4 (2.5%). Details are given in Table 1 and Figure 2.

Table 1: Descriptive statistics of different variables

Variable		Frequency (n)	Percentage (%)
Age **9.4 ± 3.73 SD**	1-5 years	43	27
	6-10 years	83	52.2
	11-15 years	33	20.8
Gender	Male	109	68.6
	Female	50	31.4
Pattern of Fracture	Mandible	48	30.2
	Midface	12	7.5
	ZMC	8	5
	Nasal	20	12.6
	Dentoalveolar	63	39.6
	Frontal	4	2.5
	NOE	4	2.5
Total		159	100

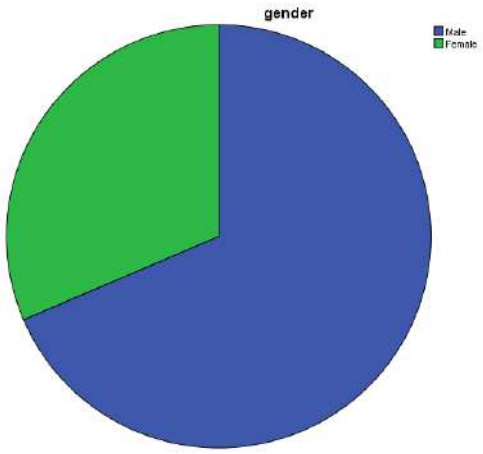

Figure 1: Pie chart showing gender distribution

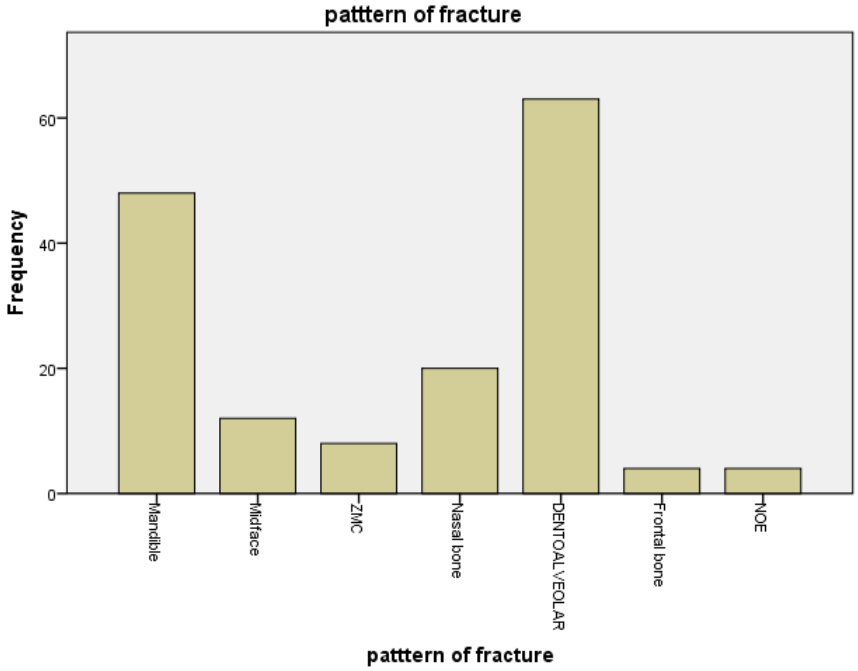

Figure 2: Bar chart showing frequency of fractures

DISCUSSION

Facial trauma in children has been noticed in increasing number in the modern era due to the introduction of automobile resulting in road traffic accidents besides sports and falls. In the recent past, road traffic accidents have been considered to be the more serious factor for causing facial disability and disfigurement in children [10, 11]. Fifty percent (50%) decline in mortality was noticed during the 1980s and 1990s in the United States due to both preventive measures and prompt provision of treatment.[12]

Between 4-12% of all facial fractures occur in children[13-15]. Greater elastic nature of the pediatric bones, higher bone to tooth ratio, and a protective environment for children may decrease the chance of facial injuries in children.[16]

Furthermore, facial injury is more common in boys than girls [13, 14]. According to a Nigeria based study, the male to female ratio for facial fractures was 3:2 [15] In our study the male to female ratio is 2.1:1. This is also similar to the study of Adekeye EO[13]. In their study, the mean age of patients with facial fractures was 8.4 ± 3.8 years[13].· Our study shows a higher frequency of facial fractures in the age group between 6-10 years (52.2%) with mean age of 9.4 ± 3.73 SD.

Risk of bone fracture is directly proportional to age [17, 18]. Age-related variations in injuries may be due to head: body in children. This may also be due to the developmental status of facial structures like teeth and the sinuses[14].

According to a study by Wei Zhou et al [19] a total of 597 reported fractures,129 patients (38.5%) had isolated fractures and 206 patients (61.5%) had multiple fractures. The mandible was frequently involved (69.3%), followed by zygoma (12.9%), maxilla (7.7%), (Naso-orbito-ethmoid) NOE (4.2%), Le Fort type (3.9%), and orbit (2.0%). However, in this study dentoalveolar fracture was most common seen in 63 (39.6%) patients in facial fractures, followed by mandibular fractures 48 (30.2%), nasal bone fracture 20 (12.6%), midface fractures 12 (7.5%), (Zygomatic Complex) ZMC fractures 8 (5%). The presentation of facial fractures reported in this study differs from the above cited studies, which may be due to the differences in environmental factors, physical activities in schools and safety measures.

There is variation in reports of facial trauma in children and adults to the emergency room (ER) based on various facts; for instance enhanced healing potential in children in well vascularized orofacial regions. Certain factors must also be considered in pediatric facial trauma patients like the anatomy of the immature face and the potential adverse effects on the growth as a result of trauma. These factors lead to differences in treatment planning between the children and adults. Children after trauma must be kept on long-term follow-up for any untoward change in the growth of the orofacial structures.

The finding of this study can be used to adopt preventive measures in our society and to prepare concerned personnel for management of pediatric facial traumas.

Lesser sample size had been the limitation of this study. The cause of facial trauma was not included. Similarly, other associated fractures were not included in the study because it could make study complicated. There is need for further studies with a larger sample size in pediatric population to make clear guidelines for emergency management in this regard; in best interest of patients, community and health care providers.

CONCLUSION

Pediatric facial fracture was common in age group 6-10 years as most of children in this group are school going. Boys were most affected than girls. Dento-alveolar fracture was most common in pediatric population and NOE being least common. Measures aimed for prevention e.g. wearing of mouth guards and other protective devices during play time in this age group are advised.

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