

# Pattern of pediatric mandibular fractures in Bareilly – A retrospective study

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## INTRODUCTION

Haug *et al.*<sup>[1]</sup> stated that trauma is the leading cause of morbidity and mortality among children worldwide.<sup>[1]</sup> Pediatric facial injuries are common due to children's high level of activity, less parental supervision, and adventurous behavior of the child.<sup>[2]</sup>

Facial injuries in children always present a challenge to the doctor in respect of their diagnosis and management. As noted by Gassner *et al.*,<sup>[3]</sup> an uncooperative child is more difficult to examine. Moreover, the diagnosis of maxillofacial trauma by radiographic examination much more difficult in child than in adult and clinical evaluation and palpation in child is tough.<sup>[3]</sup>

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**Aim:** The aim of the study was to evaluate the pattern of mandibular fractures in children <14 years of in Bareilly, Uttar Pradesh. **Materials and Methods:** This study was conducted from 2015 to 2018 across different centers in Bareilly involving 231 pediatric patients <14 years. The parameters evaluated during the course of study were age, gender distribution, etiology of trauma, and type of mandibular fracture. **Results:** It was observed that out of 231 children with facial bone fractures, 59.30% were 6–14 years (school age) old and 40.69% were under 6 years (pre-school) of age. It was seen that males were more commonly involved. Falls were the most frequent mode of injury (50.69%) and body of the mandible was most commonly involved in mandibular fractures. **Conclusion:** The incidence of pediatric facial fractures in Bareilly was high. The 6–14 years olds and boys were most commonly involved in maxillofacial pediatric trauma. The most common etiological factor was the fall.

**KEY WORDS:** Angle, body, condyle, coronoid, maxillofacial, parasymphysis, pediatric, symphysis, trauma

Several studies attributed accidental falls (58.2%) as the most common cause of pediatric facial fractures. Other causes of pediatric traumatic injuries include violence (12.7%), bicycle (10%), motor vehicle accidents (8.2%), sports injuries (7.3%), and miscellaneous represented 3.6%.<sup>[4,5]</sup> There is a pattern of facial fractures that are influenced by trends in the mechanism of injury and facial development.

The aim of this study was to analyze the patterns of mandibular fractures in children up to 14 years of age in Bareilly, Uttar Pradesh, retrospectively.

## MATERIALS AND METHODS

The present study was conducted over a period of 3 years from 2015 to 2018 to evaluate the pattern of pediatric mandibular fractures in Bareilly, Uttar Pradesh. 231 pediatric patients under 14 years were included in this study. The data collected from the patients records included, age, gender, etiology, type, and site of injuries.

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## STATISTICAL ANALYSIS AND RESULTS

The present study was conducted in Bareilly, Uttar Pradesh, to access the pattern of pediatric mandibular fractures. SPSS version 21.0 was used for data analyzing.  $P < 0.05$  considered with 95% confidence interval in the study. Chi-square test ( $\chi^2$ ) was used for the Statistical comparison of non-parametric data including age, gender, and type of pediatric fracture by gender and age.

The incidence of pediatric fractures in relation to age group is shown in Table 1. Out of 231 children with facial bone fractures,

**Table 1:** Distribution of study population by age and gender

		Mean±SD	P	$\chi^2$
Age				
<6	6–14			
94 (33.3%)	137 (66.7%)	8.34±0.304	0.067 (NS)	0.347
Gender				
Male	Female			
167 (72.29%)	64 (27.7%)			

**Table 2:** Etiology of fracture

S. No.	Etiology	n	Percentage
1.	Falls	117	50.69
2.	Violence	29	12.55
3.	Road traffic accidents	21	9.09
4.	Bicycle	18	7.79
5.	Sports	27	11.68
6.	Miscellaneous	19	8.22

**Table 3:** Pattern of pediatric fracture

S. No.	Site	n	Percentage
1.	Body of mandible	117	50.69
2.	Angle mandible	29	12.55
3.	Condyle	18	7.79
4.	Symphysis	27	11.68
5.	Coronoid	19	8.22
6.	Parasymphysis	21	9.09

**Table 4:** Type of pediatric fracture by age

Site	n	<6 years n (%)	6–14 years n (%)	$\chi^2$	P-value
Body of mandible	117	45 (38.6)	72 (61.53)	0.234	0.012 (S)
Angle of mandible	29	11 (37.93)	18 (62.06)	0.343	0.067 (NS)
Condyle	18	5 (27.7)	13 (72.22)	0.236	0.075 (NS)
Symphysis	27	9 (33.3)	18 (66.66)	0.215	0.054 (S)
Coronoid	19	3 (15.78)	16 (84.21)	0.667	0.035 (S)
Parasymphysis	21	2 (9.52)	19 (90.48)	0.248	0.014 (S)

S: Significant, NS: Non-significant

59.30% ( $n = 137$ ) were 6–14 years (school age) old and 40.69% ( $n = 94$ ) were under 6 years (pre-school) of age. The population has majority of patients in between 6 and 14 years of age group males. As  $P = 0.067$  shows statistically non-significant difference means, the population is homogeneous.

Falls were the most frequent mode of injury (50.69%,  $n = 117$ ), followed by violence (12.55%,  $n = 29$ ), sport (11.68%,  $n = 27$ ), road traffic accidents (RTA) (9.09%,  $n = 21$ ), bicycle accident (7.79%,  $n = 18$ ), and miscellaneous (8.22%  $n = 19$ ) [Table 2]. Table 3 shows that the body of the mandible was most commonly involved (50.69%,  $n = 117$ ), followed by angle mandible fractures (11.55%  $n = 29$ ), condyle (7.79%,  $n = 18$ ), coronoid process (8.22%,  $n = 19$ ), symphysis (11.6%,  $n = 27$ ), and parasymphysis (9.09%,  $n = 21$ ) fractures.

Table 4 shows the site of facial fractures by age group. Patients with age group of 6–14 years suffer more from mandibular fractures. Body of the mandible, symphysis, and coronoid has statistically significant association with age. The results show that there is a statistically significant association with age.

Males were more likely to have facial fractures in all sites than female [Table 5]. Body of the mandible is the most common site of fracture and condyle is the least common site. There is no statistical association of fracture site with gender.

## DISCUSSION

Trauma is the major causes of infant mortality.<sup>[1]</sup> Children are more susceptible to craniofacial trauma due to greater cranial mass-to-body ratio.<sup>[6]</sup> The present study was conducted in Bareilly, Uttar Pradesh, to access the pattern of pediatric mandibular fractures. It was observed that out of 231 children with facial bone fractures, 59.30% were 6–14 years (school age) old and 40.69% were under 6 years (pre-school) of age. It can be seen that males were more commonly involved. Falls were the most frequent mode of injury (50.69%) and body of the mandible was most commonly involved in fractures.

The current study showed that males were more susceptible to facial trauma than females. Injuries from low-velocity forces is the more common etiology for pediatric facial trauma in comparison to high velocity forces.<sup>[7]</sup> In the present study; falls were the most common etiological factor of facial fractures. This was also observed by Shanks *et al.*<sup>[8]</sup> who stated that RTAs

**Table 5:** Type of pediatric fracture by gender

Site	n	Male n (%)	Female n (%)	$\chi^2$	P-value
Body of mandible	117	79 (67.52)	38 (32.47)	0.455	0.062 (S)
Angle of mandible	29	12 (41.37)	17 (58.62)	0.376	0.081 (NS)
Condyle	18	11 (61.11)	7 (38.88)	0.432	0.061 (NS)
Symphysis	27	20 (74.07)	7 (25.92)	0.322	0.065 (S)
Coronoid	19	15 (78.94)	4 (21.05)	0.541	0.071 (S)
Parasymphysis	21	19 (40.48)	2 (9.52)	0.348	0.672 (S)

S: Significant, NS: Non-significant

are a major factor for pediatric facial injuries in KSA. Similarly research conducted by Posnick *et al.*<sup>[9]</sup> Holland *et al.*,<sup>[10]</sup> and Ferreira *et al.*<sup>[11]</sup> also concluded that RTA is the major cause of pediatric traumatic injuries in children.

Our study inferred that the body of the mandible was commonly affected which is in agreement with the majority of studies which have reported the mandible as being the most common bone involved in pediatric facial fractures.<sup>[9,11-15]</sup> More mandibular fractures are recorded in children than in the middle third of the face.<sup>[15-17]</sup> The reasons for this distribution have been previously reported.<sup>[18]</sup> Adekeye *et al.*<sup>[16]</sup> observed that mandibular fractures were more frequent in the symphysis (24%) and least frequent in the condylar regions.

Conflicting results from other studies might be due to differences in demographic, socioeconomic, and cultural patterns.

## CONCLUSION

Within the limitations of the present study, it can be concluded that falls is the major cause of pediatric facial trauma in children in Bareilly, Uttar Pradesh. It was observed that out of 231 children with facial bone fractures, 59.30% were 6–14 years (school age) old and 40.69% were under 6 years (pre-school) of age. It can be seen that males were more commonly involved. Falls were the most frequent mode of injury (50.69%) and mandible was most commonly involved in fractures.

Hence, it is imperative that preventive measures should be practiced and observed indoors or outdoors. Children in the growing phase should be monitored periodically to detect and prevent early facial asymmetry or malocclusion. Safety programs and orientation sessions for the parents and guardians should be instituted to increase public awareness.

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