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Original Research Article

A Study of Analysis of Prevalence of Mandible Fracture among School Going Age Group in Vadodara District of Gujarat, India

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Abstract

Background: Children under the age of 15 account for about 5% of all face fractures, and children under the age of 5 have a far lower incidence. Their incidence rises when children begin school. Between puberty and adolescence, it surges as well. There is a male majority throughout all age groups.

Objectives: This retrospective study examined the causes and patterns of paediatric mandibular fractures.

Methodology: The clinical records of 100 children (50 males and 50 females) aged 0 to 15 years who presented with mandibular fractures from July 2019 to June 2021 were retrospectively reviewed. The sex, patient age, site of fracture, etiology of trauma, and monthly variations of the fractures were recorded. Descriptive statistics, the z-test and chi-square test were used for statistical analysis and the P-value less than 0.05 was considered as a significant.

Results: 100 children (male-to-female ratio 1.01:1) sustained 121 mandibular fractures. Within the study sample, the 6-to-10-year age group and fall from the height (72%) was the cause of mandibular fractures in majority of subjects, followed by sports injury (18%) and Road traffic injury. (8%). The most common site was the condylar region (33%) followed by Symphysis/ Parasymphsis (42%), body (13%), and Body / Angel (12%).

Conclusion: We would like to draw the conclusion that falls are the main reason for mandibular fractures and that condylar fractures are the most frequent form of fracture. According to the study's findings, there was no discernible gender difference in the incidence of mandibular fractures.

Keywords: Children, Mandible, Fracture.

Introduction

The second most frequent facial fracture is a broken mandible. With the introduction of fast-moving autos, the number of incidents has significantly increased in recent years. [1,2] Face trauma has become a sort of societal disease from which no one is

immune due to the rapid pace of modern living, high-speed travel, and an increasingly violent and intolerant society. Changes in facial injury patterns, severity, clinical characteristics, and other factors cause minor to severe deformity of the maxillofacial skeleton as well as functional loss. In addition to violence and transportation accidents, sports, falls, and guns can all cause direct or indirect trauma. On occasion, it might also be a complication of other conditions, such as metabolic disorders, neoplasms, and cystic lesions. [3]

The only moveable bone in the maxillofacial complex is the mandible, which also experiences more fractures than other body parts [4,5]. Internal factors like age, health, and other portions of the fracture, as well as external factors like the direction and magnitude of external forces exerted, can all determine where a mandibles fracture occurs. The methods by which mandibular fractures happen have been the subject of numerous investigations, yet external influences can vary widely. We concentrated on internal elements in order to have a thorough grasp of the many variables that impact where a mandibular fracture occurs. This study was undertaken to study mandibular fractures clinicoradiologically with an aim to calculate incidence and study pattern and the commonest site of fractures in population in and around Vadodara District, Gujarat, India.

Materials and Methods

From July 2019 to June 2021, the Department of Dentistry and ENT at Parul Sevashram Hospital in Vadodara, Gujarat, undertook this retrospective study. All individuals who had mandibular fractures and were 15 years of age or younger were examined. Three groups of subjects were created: Group A (0–5 years), Group B (6–10 years), and Group C. (11-15 years).

Age, sex, place of residence, fracture mechanism, anatomic location of fracture, and date of trauma were used to categorise patients.

The trauma's origin was categorised as a fall from a height, a road traffic accident (RTA), a play- or sports-related injury, a bicycle accident, an assault, or other.

-The patient's panoramic and/or computed tomographic examination was used to pinpoint the anatomical locations of the mandibular fractures. In addition, Killey's [6] classification of mandibular fracture sites—symphyseal, para symphyseal, body, angle, ramus and condyle was used.

Exclusion criteria: Patient charts with incomplete information, extensive head injury and the presence of pathology were excluded from the study.

The results were tabulated and analyzed using SPSS software. Descriptive analyses including frequency, percentage, and proportions were performed. Where appropriate, the significance of the findings was evaluated using the z-test and chi-square test. The level of significance was set at P less than 0.05.

Results

Records for 121 different maxillofacial trauma patients were taken out for analysis. 100 of them were children, and 44.1% of them had mandibular fractures.

The male to female ratio was 1.02:1 among the 89 patients, with 45 (50.6%) men and 44 (49.4%) women.

Table 1: Age and sex wise distribution of study subjects (n = 100).

Age Group	Male (%)	Female (%)	Total(%)
Group A	15 (15%)	11 (11%)	25
Group B	22 (22%)	20 (20%)	45
Group C	13 (13%)	19 (19%)	30
	50	50	100(100%)

The mean patient age 8.73±3.02 years;

The average age of patient was 8.73±3.02 years women were somewhat older on average (8.10±3.02 years) than men (7.26±2.89 years). It was not statistically significant that this difference existed (z for 95% CI=1.96).

The majority of patients (45 patients, or 45%) belonged to Group B, followed by Group C (30 patients, or 30%), and Group A (25 patients, or 25%).

Table 2: Etiology wise Distribution of Study Subjects

Cause of fracture	Number	Percentage(%)
Fall from the height	72	72**%**
Road traffic injury	8	8**%**
Spots injury	18	18**%**
Others	2	2**%**
	100	100

According to Etiology wise Distribution of Study Subjects: fall from the height (72%) was the cause of mandibular fractures in majority of subjects, followed by sports injury (18%) and Road traffic injury. (8%).

Table 3: Classification according to Site of Mandibular Fractures (n = 100).

Site of fracture	Number	Percentage(%)
Condyle	33	33**%**
Symphysis/ Parasymphsis	42	42**%**
Body / Angel	12	12**%**
Combination / Multiple	13	13**%**
	100	100

The most common site was the condylar region (33%) followed by Symphysis/ Parasymphsis (42%), body (13%), and Body / Angel (12%).

Fracture of the ramus (1.5%) was observed only in Group C. There were no coronoid fractures observed in our study. Multiple fractures were most commonly observed in the condylar and parasymphyseal regions.

Discussion

Through industrialization and urbanisation, society developed slowly, and it was noted that modern people had more chances for sports and leisure pursuits. In addition to affecting a person's lifestyle, these social changes also result in an increase in injuries. The maxillofacial region is vulnerable to fractures and injuries because of its projecting anatomical nature. The sole movable bone in the maxillofacial complex is the mandible, which also experiences more fractures than other body parts [7,8]. Internal

factors like age, health, and other portions of the fracture, as well as external factors like the direction and magnitude of external forces exerted, can all determine where a mandibles fracture occurs. The methods by which mandibular fractures happen have been the subject of numerous investigations, yet external influences can vary widely. One of the leading causes of morbidity and mortality in children is maxillofacial trauma. Younger age-related mandibular fractures may result in functional disability and deformity. Mandibular fracture patterns and aetiologies vary according to geographic location, cultural traits, and socioeconomic level.

The goal of this study was to examine the prevalence, most frequent site, and combinations of mandibular fracture sites, as well as the relationships between fracture site and aetiology and the number of fracture sites in the mandible with age, sex, and aetiology. Most studies have found that men in all age groups are more likely than women to sustain craniofacial injuries [9-11]. Mandibular fractures and maxillofacial injuries typically occur more frequently in men (2:1) than in women. The outcomes of our investigation, however, did not reveal any appreciable sex bias. According to Cole *et al* analysis [12],.'s both sexes are equally susceptible to mandibular fractures when they are young. As a result, at a young age, sex-related fracture disparities are less important.

In this study, falls from height (44.9%) were the main factor in mandibular fractures. According to Collao-González *et al*. [13], Joshi *et al*. [14], Namdev *et al*. [15], Owusu *et al*. [16], and Kumaraswamy *et al*. [17], falls from height were the most frequent mechanism of maxillofacial trauma in children. Our findings support their findings. In this study, falls from a height caused mandibular fractures in more than half of the population in Groups A and B, which represents modest velocity/energy trauma. According to Kumaraswamy *et al*. [17], falls in the home were the most common cause of maxillofacial trauma in children under the age of 6, and as children aged and spent more time outdoors, falls tended to occur outside the home.

The most frequent location of mandibular fracture in this study was in the condylar area. Our findings support earlier research' findings that the condyle is the most often fractured part of the mandible. Condylar fractures made up the bulk of cases (52%) in preschoolers, and the frequency declines with age. Children's condylar processes have a high bone marrow concentration and a comparatively thin cortex. Thus, during a fall, this results in poor resistance to low velocity trauma. Condylar fractures made up 39% of all mandibular fractures overall in the current investigation. The results of Almahdi and Higz [18], Namdev *et al*. [15], Owusu *et al*. [17] and Shi *et al*. (55.7%) are equivalent to this. [19] In addition, 48.3% of patients had fractures at more than one place when they were first seen. The parasymphyseal and condylar areas are the most often affected by multiple fractures. The parasymphysis and condyle are often fractured locations, according to patients who had RTA as their primary cause of mandible fractures.

Conclusion

We would like to draw the conclusion that falls are the main reason for mandibular fractures and that condylar fractures are the most frequent form of fracture. According to the study's findings, there was no discernible gender difference in the incidence of mandibular fractures.

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