

## Epidemiology of Nasal Bone Fractures: is it Most Common Maxillofacial Injury?

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Conflict of interest: Nil

### Abstract:

**Introduction:** Nasal bone fractures occur more frequently in a maxillofacial injury because of its location at the forefront of the face.

**Objective:** To evaluate the prevalence of nasal bone fractures in our institute.

**Method:** We retrospectively investigated 152 RTA patients and recorded their demographics and fracture sites and statistically analyzed for significant associations.

**Results:** The age of the cases ranged from 5-70 years. The prevalence of nasal bone fractures in our study was 63.15%. The peak incidence was seen in 21 to 40 years. Males were significantly more affected than females.

**Conclusion:** The results showed that nasal bone fracture was the commonest among all maxillofacial injuries, with maximum preponderance among young male adults.

**Keywords:** trauma, fracture nasal bone, faciomaxillary.

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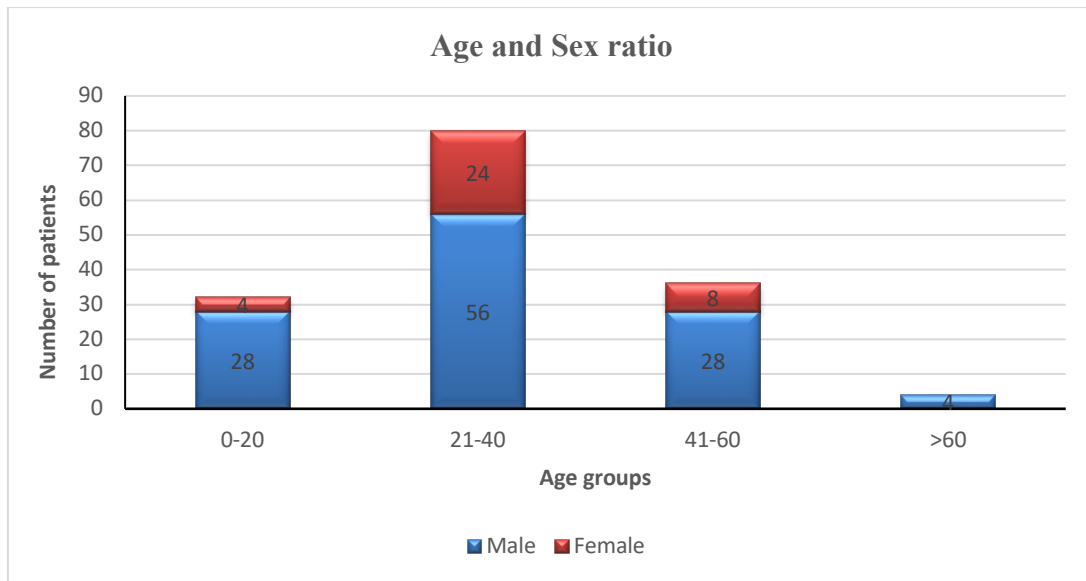
### Introduction

Maxillofacial fractures have been reported to be one of the most prevalent traumas worldwide [1]. The nasal fractures are one of the most frequent services performed by the otorhinolaryngologist [2]. The nasal bone-cartilage framework includes a bony pyramid, cartilage, and nasal septum. As the nasal bone is located at the forefront of the face, both the bony and cartilaginous components are susceptible to trauma. Nasal fractures are any cracks or fractures in the bony part of the nose [3]. They are the third most common fracture of the skeletal system of body [4]. Road traffic accidents were reported as commonest cause for facial fractures followed by assault and fall respectively [5]. The anatomic location and pattern of such fractures are determined by several factors like the mechanism of injury and the direction of impact. Considering the utmost striking cosmetic effects it has, the current study was conducted to analyze the epidemiology of maxillofacial trauma and to evaluate the prevalence of nasal bone fractures at a tertiary care hospital.

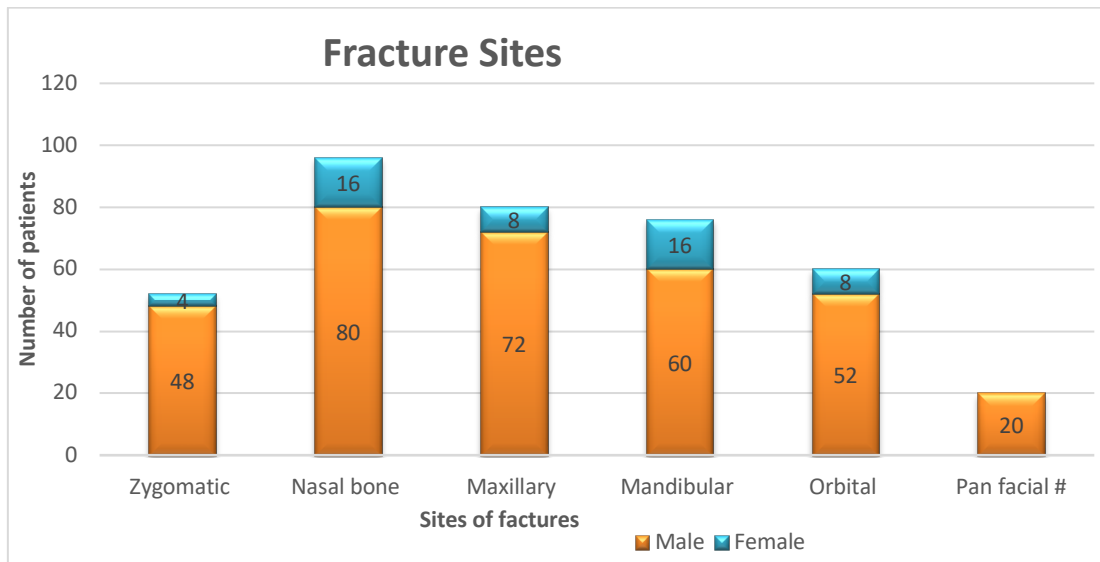
**Method:** A retrospective descriptive study was conducted at a tertiary care hospital at Udaipur, 152 RTA patients with maxillofacial fracture who underwent CT-Face in a span of one year from July 1, 2022 to June 30, 2023 were included in the study.

The patient's gender, age, cause of injury and fracture sites (zygomatic arch, nasal bone, mandible, maxilla, orbit and pan-facial) was recorded. Different statistical analysis methods were used such as mean, mode, prevalence ratio, %distribution. The various software like MS Excel, Microsoft word were used respectively for tabulating data for analysis and for pictorial presentation of the same using bar graphs and pie charts.

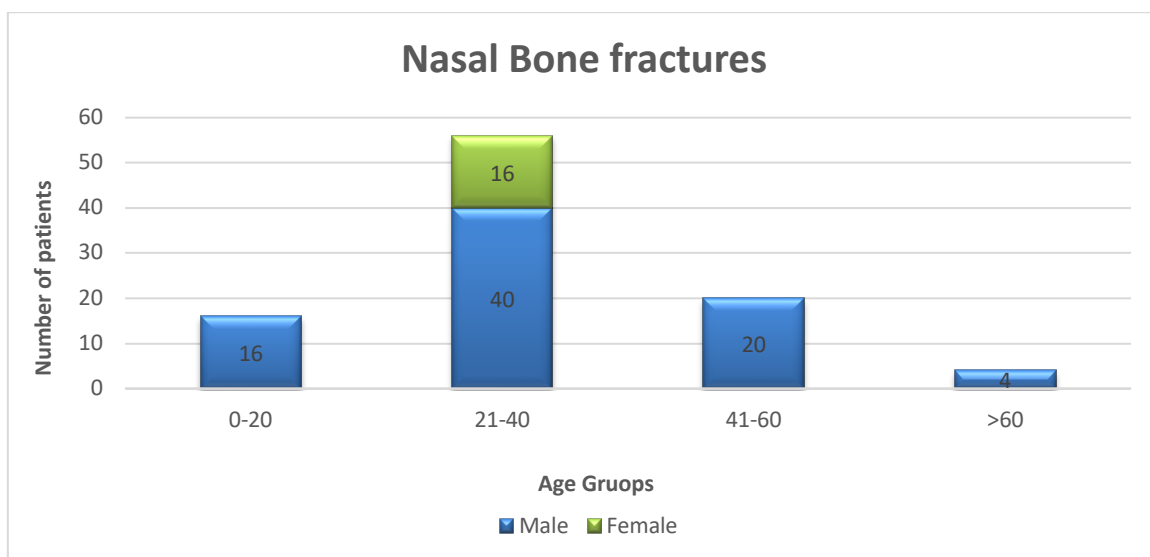
**Result:** Out of the 152 cases evaluated, they were 120 male patients and 32 female patients. The most affected age group of maxillofacial fractures due to RTA was found to be 21 to 40 years (table1). The most frequent fracture site was nasal bone 63.15% (M-52.63% & F-10.52%) followed by maxillary 52.63% (M-47.36% & F-5.27%), mandibular 50% (M-39.47% & F-10.52%), orbital 39.47% (M-34.21% & F-5.26%), zygomatic 34.21% (M-31.57% & F-2.63%) and lastly pan-facial 13.15% (M) (table 2). Nasal bone fracture was seen in a higher proportion among males (83.33%) than females (16.66%) (Table 3). The nasal bone fracture was most commonly seen among 21-40 year age group (table 3). Out of 96 nasal bone fractures, 61 needed reduction while 35 were managed on observation arm.



**Table 1: The age and sex ratio of maxillofacial fracture patients**



**Table 2: Table showing fracture sites and sex ratio relation of maxillofacial fractures in studied patients**



**Table 3: Table showing age and sex ratio in nasal bone fracture patients**

## Discussion

According to the Global Burden of Disease, the global incidence of maxillofacial fractures is increasing<sup>6</sup>. Maxillofacial injuries resulting from traffic accidents occur quite frequently, it accounts for 60% of facial injuries that take place [7,8]. In our study, nasal bone fractures were the most common type of fracture, consistent with the findings of Soundarya et al [10] and Adesina et al [11]. Similar outcome was also obtained in some other study on facial bone fractures, i.e.; ‘Analysis of facial bone fractures: An 11-years study of 2094 patients’ which stated that, in the present study, the most commonly fractured isolated bones were the nasal bone then mandible [11]. Another study stated that, the motorcycle accident is an important facial trauma cause, mainly due to the current use of helmet without protection of the face. Within the motorcycle accidents, the nasal bone is one of the most fractured followed by the orbit and maxilla [12]. This may be related to the protruding nature of the nose in the facial position, relatively unprotected and with very little soft tissue cover. When falling forward, the nose is likely to hit the ground first.

Nasal bone fractures are commonly observed in clinical settings. Although nasal bone fractures are considered minor injuries, the nasal bone is highly important in facial aesthetics [13]. According to ages of patients with nasal bone fractures, one study reported that nasal bone fracture was the most common among subjects in their 20s [14]. Another study stated that nasal bone fracture often occurs in people aged 11–20 years [15]. According to our study, we found that the mean age of patients of nasal bone fracture was within the range of 17 to 45 years. This result is close to the 19 to 44-year age group (65.6%) in the study by Al Bokhamseen et al [16]. This is because 21 to 50-year-olds are the main labor force of society, having increased involvement in travelling to workplace. Thus, they are more likely to develop maxillofacial trauma leading to nasal bone fractures.

Our study noted that nasal bone fractures were common in males than females with M: F= 5:1. Similar male predominance was seen in other studies which were done in India [17], which could have occurred due to the fact that males are still the main working community and are hence more exposed to work-related stress and workplace injuries. The ratio of males to females with nasal bone trauma in Northwest China was 4:1 [18], which is similar to that reported worldwide [19] and in accordance with studies in Western [20], Southeast [21].

The other causes of increased incidence of injuries in this age group and gender may be due to their risk-taking behaviour, peer pressure or, in the most

of cases, violation of traffic rules. Whether demanding treatment or not, nasal bone fractures definitely remain to be the most common faciomaxillary fracture and its importance lies in the virtue of the effect it has on facial cosmesis.

## Conclusion

The results from our study indicated that, yes, the nasal bone fracture was the most common maxillofacial injury. It has a higher prevalence among males. The age range in which people are prone to nasal bone fractures in our region was 21–40 years old. The insight into the epidemiology of maxillofacial fractures was useful not only for developing prevention strategies but also for decisions with regard to patient care, development of optimal treatment regimens and appropriate resource allocation as ours is an institute located on the National Highway-27 and the emergency department has witnessed many RTA patients having maxillofacial trauma. To prevent such accidents leading to maxillofacial trauma, it has become an absolute need of the hour to intensify and implement the restrictive laws in the field of traffic and to develop urban and rural roads with proper functional street lights.

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