

Profile of Patients with Maxillofacial Fracture in Emergency Department, Head- Neck Surgery Division, Dr. Soetomo Public Hospital Surabaya in 2020

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1 Profile of Patients with Maxillofacial Fracture in Emergency Department, Head-Neck Surgery Division, Dr. Soetomo Public Hospital Surabaya in 2020

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KEYWORDS

COVID-19 pandemic, Indonesia, maxillofacial fracture, profile

ABSTRACT

Maxillofacial fracture is the most common form of injury in trauma patients, especially in patients with motor vehicle accidents. The COVID-19 pandemic has affected various sectors, including restrictions on people's mobility. This study aims to determine the profile of patients with maxillofacial fractures during the COVID-19 pandemic. A descriptive observational study was conducted to evaluate maxillofacial fracture patients who came to the Emergency Department of the Head-Neck Surgery Division of the Dr. Soetomo Surabaya Hospital in 2020. Subjects were grouped according to sex, age, month of visit and the mechanism of trauma. The ratio between men and women was 4.92:1. The largest age distribution is in the 11-20 years range, as much as 39.2%. The most distribution based on the month of visit was in February as much as 16.9%. Most trauma mechanisms were due to traffic accidents (90.1%). Most locations in single maxillofacial fractures in maxillary bone were 37.8% and multiple maxillofacial fractures in zygoma bones were 79.4%. Accompanying trauma was found in 73.2% of subjects, with the highest pattern of intracranial trauma as much as 80.8%. The incidence of single maxillofacial fractures was 47.9% and multiple maxillofacial fractures were 52.1%, with concomitant trauma occurring in 73.2% of subjects.

INTRODUCTION

On March 11th 2020, WHO declared Coronavirus-Disease 2019 (COVID-19) as a global pandemic. To deal with the pandemic, Indonesian authorities have been exerting large scale social restrictions (locally known as PSBB / "Pembatasan Sosial Berskala Besar"). These restrictions include reducing activities outside home, limitation on mass activities and the banning of festivals. The imposition of these restrictions appears to indicate a significant reduction in the leading cause of trauma cases in Indonesia: traffic accidents [1].

Maxillofacial fracture is one of the most common forms of injury sustained by trauma patients. Maxillofacial injuries can include soft tissue injuries such as abrasions, contusions, lacerations and avulsions; it can also be a fracture on the facial bones. Maxillofacial injury can be in the form of a single injury or in combination with injuries to the other parts of the body [2]. The latest data at Dr. Soetomo Hospital indicates that there were a total of 129 maxillofacial fractures cases from 2015 to 2016 (Head and Neck Surgery division). In 2015, there were 61 cases of maxillofacial injuries, with male patients bearing the highest risk (70.5%). In 2016, there were 68 cases in which 83.82% were male patients. The male to female ratio was 3.4:1 [3]. During the COVID-19 pandemic, a data collected from France indicated a significant reduction of the incidence of maxillofacial trauma

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when compared to an equivalent period of 2018 and 2019 (106 cases compared to 218 and 296 cases)[1]. Data in London shows that there were 111 referral cases with maxillofacial fractures at King's College Hospital in the first 6 weeks of lockdown, this number decreased significantly when compared to the same period of 2019 in which there were a total of 380 referrals [4]. The purpose of this study was to obtain an overview of the impact of the COVID-19 pandemic and related government policies on the distribution and epidemiological pattern of maxillofacial fractures in the Head-Neck Surgery division at the RSUD Dr Soetomo Surabaya.

MATERIALS AND METHODS

The design of this study uses a cross-sectional observational descriptive study to elucidate general understandings of patients with maxillofacial fractures in the Head-Neck Surgery section, Dr. Soetomo General Hospital (Surabaya, Indonesia) during the COVID-19 pandemic period from January to December 2020. The study was conducted at the Emergency Department, Dr Soetomo General Hospital, Surabaya, Indonesia between January 2020 – December 2020. The research sample was collected by total sampling on maxillofacial fracture patients obtained during the visitation conducted at the Emergency Department, with a maxillofacial fracture evidenced by the results of radiological reading (head CT scans) during the COVID-19 pandemic period January-December 2020. Maxillofacial fracture patients with other accompanying trauma were also included into the study's criteria. However, maxillofacial trauma patients from the Emergency Department who were not registered to the Head-Neck Surgery section as well as maxillofacial trauma patients from the Surgical Clinic of Dr. Soetomo Public Hospital, Surabaya were excluded from the study. All participants had read and signed the information disclosure consent form. The study protocol was approved by the Ethical Committee of Dr Soetomo Public Hospital, Indonesia (Protocol No. 0444/LOE/301.4.2/IV/2021). The variables studied were age, gender, location of the maxillofacial fractures, the number of maxillofacial fractures, the presence of concomitant trauma and the type of concomitant trauma. The data obtained were processed using the application SPSS for Windows version 23.

RESULTS

The study was conducted by collecting data on patients who visited the Emergency Department of

the Head-Neck Surgery Division of Dr. Soetomo Hospital during a period of 12 months starting from January 2020 to December 2020. From this study, 71 study subjects met the inclusion and exclusion criteria.

The research subjects consisted of 59 men (83.1%) and 12 women (16.9%). The age distribution ranged from teenagers to patients in their 80s, with the highest number of patients concentrated in the 20s group followed by the 30s, where the frequencies were 28 patients (39.4%; 11-20 years) and 19 patients (26.8%, 21-30 years), as shown in Figure 1.

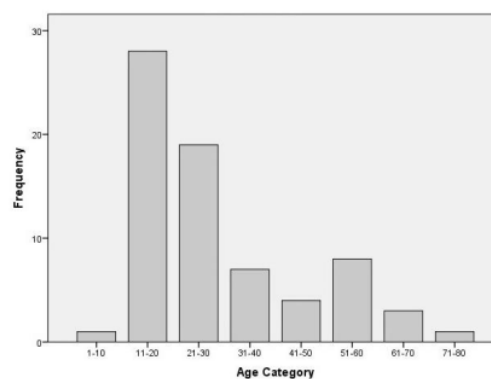


Figure 1 Age Group Distribution

The highest number of visits was in February with 12 visits (16.9%) and the lowest was in October with 1 visit (1.4%), as shown in Figure 2.

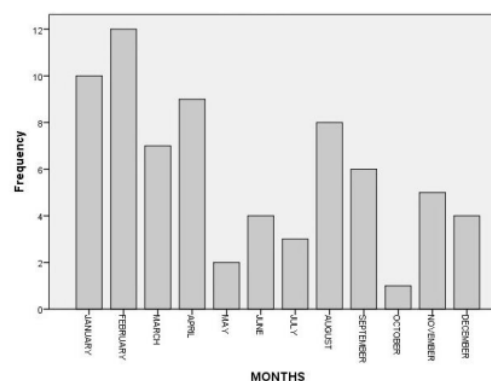


Figure 2 Frequency of visits by month

The most trauma mechanism sustained is due to traffic accidents, which was 64 patients (90.1%) and the least was due to falling from height (2 patients; 2.8%). There were no patients with trauma mechanisms due to sports and work accidents. The description of the data on the characteristics of the subjects is shown in Table 1.

Table 1 Subject Distribution's Characteristic

| | | 2020 | |
|----------------------------|------------------|------|------|
| | | n | % |
| Gender | Men | 59 | 83.1 |
| | Women | 12 | 16.9 |
| Age | 1-10 | 1 | 1.4 |
| | 11-20 | 28 | 39.4 |
| | 21-30 | 19 | 26.8 |
| | 31-40 | 7 | 9.9 |
| | 41-50 | 4 | 5.6 |
| | 51-60 | 8 | 11.3 |
| | 61-70 | 3 | 4.2 |
| Month of visit | 5-80 | 1 | 1.4 |
| | Jan | 10 | 14.1 |
| | Feb | 12 | 16.9 |
| | March | 7 | 9.9 |
| | Apr | 9 | 12.7 |
| | May | 2 | 2.8 |
| | June | 4 | 5.6 |
| | July | 3 | 4.2 |
| | Aug | 8 | 11.3 |
| | Sept | 6 | 8.5 |
| | Oct | 1 | 1.4 |
| | Nov | 5 | 7.0 |
| Dec | 4 | 5.6 | |
| Mechanism of Trauma | Traffic accident | 64 | 90.1 |
| | Violence | 5 | 7.0 |
| | Fall from height | 2 | 2.8 |
| | Sport | 0 | 0.0 |
| | Work accident | 0 | 0.0 |

The incidence of single maxillofacial fractures was observed in 14 patients and the incidence of multiple fractures was found in 37 patients (Table 2). In the case of a single maxillofacial fracture, the largest distribution was found in the maxillary location, which corresponds to a total of 14 subjects (37.8%). With regards to the incidence of multiple maxillofacial fractures, the largest distribution was found in the maxillary location which corresponds to a total of 24 subjects (70.6%), mandible corresponding to 21 subjects (61.8%), and zygoma corresponding to 27 subjects (79.4%).

From the characteristics of the concomitant trauma's data, we found that the number of maxillofacial fracture subjects without concomitant trauma were 19 subjects (26.8%) and subjects with concomitant trauma were 52 subjects (73.2) (Table 3). The distribution of concomitant trauma was found mostly in intracranial trauma, there were 42 subjects (80.8%) that fitted this category.

Table 2 Subject Distribution of Maxillofacial Fracture

| | Total | | n | % | | |
|----------------------------------------|---------------|-------------------|----|------|----------|------|
| Single Maxillofacial Fracture | 34 (47.9%) | Fracture Maxilla | 14 | 37.8 | | |
| | | Fracture mandible | 9 | 24.3 | | |
| | | Fracture zygoma | 8 | 21.6 | | |
| | | Fracture nasal | 5 | 13.5 | | |
| | | Fracture NOE | 1 | 2.7 | | |
| Multiple Maxillofacial Fracture | 37 (52.1%) | | | | Positive | % |
| | | Fracture maxilla | 24 | 70.6 | 10 | 29.4 |
| | | Fracture mandible | 21 | 61.8 | 13 | 38.2 |
| | | Fracture zygoma | 27 | 79.4 | 7 | 20.6 |
| | | Fracture nasal | 9 | 26.5 | 25 | 73.5 |
| | | Fracture NOE | 6 | 17.6 | 28 | 82.4 |

Table 3 Distribution of Concomitant Trauma

| | n | % | | n | % |
|-----------------------------------|----|------|--------------|----|------|
| Without concomitant trauma | 19 | 26.8 | | | |
| With concomitant trauma | 52 | 73.2 | Intracranial | 42 | 80.8 |
| | | | Thorax | 10 | 19.2 |
| | | | Abdomen | 4 | 7.7 |
| | | | Pelvis | 2 | 3.8 |
| | | | Extremities | 25 | 48.1 |
| | | | Spinal | 1 | 1.9 |

DISCUSSION

The research subjects consisted of 71 patients studied during visitations throughout 2020. When we compared the data from this study with other studies conducted at the same location in 2015 and 2016, we found that there was no decrease in the number of subjects [3]. This suggests that COVID-19 pandemic did not affect the epidemiology of maxillofacial fractures in Dr. Soetomo General Hospital. There was a discrepancy with the study of epidemiology in other trauma referral centres. These discrepancies might be caused by the fact that this study does not specify a specific time during the lockdown period in Surabaya, but instead as a cumulative of samples collected throughout a period of one year. Based on the sex, we found that male was the predominant subject with maxillofacial trauma (59 male subjects; 83.1% vs. 12 female subjects; 16.9%). Our results were in line with previous results conducted in 2015-2016, where male was reported to be the gender with a higher risk of maxillofacial trauma as indicated by a frequency ratio of 100 male subjects to 29 female subjects that were obtained by the study [3]. This data shows the number of maxillofacial fractures incidences are much more dominant in men to that of women, with a ratio of 4.92:1.

From the age distribution, we found that the highest number of incidents happened in the patients aged 11-20 years, which corresponds to 28 subjects (39.4%) followed by the 21-30 years' group, which corresponds to 19 subjects in total (26.8%). The result of a similar study showed that the mean of age of patients that sustained maxillofacial fracture was 33.1 years old [5]. From the distribution of the mechanisms of injury experienced by the patients, it was found that the most mechanisms were due to traffic accidents, which corresponds to 64 cases (90.1%). These results might differ between regions. In Asia, the highest incidence rate was due to traffic accidents, such as Japan at 38.5% and India at 40%; whereas in Europe, America and Australia the etiological distribution is much different, with violence being the leading cause of the injury [6]. From the distribution of fracture locations, it was found that the locations were mostly in the maxillary location, which corresponds to 14 subjects (37.8%) having a single maxillofacial fracture and on the zygoma, which corresponds to 27 subjects (79.4%) sustaining multiple maxillofacial fractures. This result is different from the study conducted in 2007, where the most frequent locations were found to be in the lower face area, corresponding to as many as 371 patients (62%) [7]. The difference

in the results of this study with various other studies can be caused by the discrepancies in the mechanism of trauma. From the description of the presence of concomitant trauma in maxillofacial fractures, it was found that 52 subjects (73.2%) sustained concomitant trauma and 19 subjects (26.8%) suffered no concomitant trauma. This result is different from other studies at the same research location conducted throughout the 2015-2016 period, where there was concomitant trauma in 60 out of 129 subjects (46.5%) [3]. This difference can be correlated to the differences in the etiological pattern of trauma in the study subjects. From the description of the concomitant trauma pattern, it was found that the most frequent concomitant trauma pattern was intracranial trauma, which corresponds to 42 subjects (80.8%). This result is different from a previous local study conducted from the period of 2015-2016, where the frequency of subject that sustained concomitant trauma in the form of brain injury was 60 subjects and another 30 subjects sustained injuries to the extremities, thoracic and abdominal [3]. The difference between the results in this study could be due to the different approach employed in classifying the concomitant trauma pattern.

CONCLUSION

Comparisons were carried out on the data of subjects which suffered maxillofacial fractures, in which such data showed that the male to female ratio was 4.92:1. The group of age that represented the most number of subjects for the incidence of maxillofacial fractures was the 11-20 years group, with a relative abundance of 39.4%. The trauma mechanisms that were mostly sustained through maxillofacial fractures were due to traffic accidents, with a relative abundance of 90.1%. The incidence of single maxillofacial fractures was 47.9% and multiple maxillofacial fractures was 52.1%. Concomitant trauma occurred in 73.2% of cases of maxillofacial fracture with intracranial trauma pattern being the most frequently seen concomitant trauma, which represented 80.8% of all cases.

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DECLARATION OF INTEREST

The authors have no conflicts of interest to declare.

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