PATTERN OF MAXILLOFACIAL INJURIES DURING COVID-19 PANDEMIC AT BIRAT MEDICAL COLLEGE TEACHING HOSPITAL OF EASTERN NEPAL

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ABSTRACT

Introduction

Maxillofacial injuries are one of the most common injuries seen in trauma patients. Road traffic accidents (RTA) are the most common cause of maxillofacial injuries all over the world. RTA are supposed to decrease due to lockdown which has become a usual phenomenon during the COVID-19 pandemic. Changes in the etiology of maxillofacial injuries are supposed to dictate their pattern as well.

Objectives

The objective of this study was to assess the pattern of maxillofacial injuries during the COVID-19 Pandemic at Birat Medical College and Teaching Hospital.

Methodology

A cross-sectional study was conducted among the patients attending Birat Medical College and Teaching Hospital for the treatment of maxillofacial injuries from 1 May to 31 July 2020. Consecutive sampling was used to collect data from 52 study participants.

Results

A total of 52 patients with maxillofacial injuries were studied. The age of patients ranged from 1 year to 73 years with a median age of 26 years. There were 69.2% (n=36) males with a male to female ratio of 2.25:1. The most common etiology was Road Traffic Accidents (50%, n=26). Laceration (70.7%, n=29) was the most common soft tissue injury. Parasymphysisfracture (23.8%, n=5) was the most common site of mandible fracture. The most common midface fracture was the zygomaticomaxillary complex (ZMC) fracture (40.9%, n=9).

Conclusion

RTA still remains the most common etiology of maxillofacial injuries in spite of COVID-19 and the pattern of maxillofacial injuries has not changed much either.

KEYWORDS

COVID-19, fracture, mandible, maxillofacial injuries

INTRODUCTION

Maxillofacial injuries are one of the most common injuries seen in trauma patients. Maxillofacial injuries may present as soft tissue injuries such as abrasion, contusion, laceration, and avulsion. It may also present as fractures of facial bones in the form of Lefort I, Lefort II, Lefort III fractures, zygomaticomaxillary complex fracture (ZMC), zygomatic arch fracture, blow out fracture of orbit, naso-orbito-ethmoidal (NOE) complex fracture, fracture of the mandible, etc. Maxillofacial injuries may present solely or maybe in combination with injuries to other parts of the body as well. Maxillofacial injuries alone are rarely fatal however if they have a serious impact on the airway, breathing and circulation may lead to death as well. Maxillofacial injuries are emergencies that require extensive management based on their presentation. Maxillofacial injuries are associated with several anatomic structures such as the eye, ear, nose, oral cavity. So injuries to the maxillofacial area have a serious effect on the quality of life.[1]Maxillofacial injuries are often associated with severe morbidity, loss of function, substantial financial cost and disfigurement.[2]

There are various etiologies of maxillofacial injuries such as Road Traffic Accidents (RTA), fall, assault, sports-related injuries, war, industrial accidents, animal attacks, etc. RTA remains the most common cause of maxillofacial injuries all over the world, although there is a decreasing trend, particularly in North America and Brazil, and Europe. In these continents, assaults and falls have become more important. In Asia and Africa RTA remains the most common etiology.[3]

The World Health Organization (WHO) declared COVID-19 as a pandemic on 11 March 2020 as it started to spread around the world. The world has responded to the COVID-19 pandemic by lockdown and behavior modifications like washing hands with soaps, using sanitizers, wearing masks, measuring temperatures at entry points, and maintaining social distance. It seems that preventive measures such as travel restriction, social distancing will remain in place for a long time. Various studies done in Nepal, prior to the COVID-19 pandemic have shown RTA to be the main etiology of the maxillofacial injuries.[4-9] GUO Yu-Xuan et al in their study done during the COVID-19 epidemic showed fall to be the main cause of the facial injury rather than a traffic accident.[10] There is a gap in the knowledge of the pattern of maxillofacial injuries during the COVID-19 pandemic. Epidemiological assessments of maxillofacial injuries during this COVID-19 pandemic will be crucial to identify patterns of maxillofacial injuries. It will help to initiate preventive measures as per the pattern of maxillofacial injuries.

METHODOLOGY

We conducted a cross-sectional study among patients attending Birat Medical College and Teaching Hospital for the treatment of maxillofacial injuries from 1 May to 31 July 2020. Consecutive sampling was used to collect data from 52 study participants. Ethical clearance was taken from the Institutional Review Committee of Birat Medical College and Teaching Hospital, prior to the study. Informed consent was taken from study participants and from parents if the age of the participants was less than 18 years. All the patients with maxillofacial injuries who visited the Emergency department and Dental outpatient department for treatment were included in the study. Patients not willing to be enrolled in the study were excluded. Patient demographics, cause of injury, associated injuries to other parts of the body, alcohol consumption, soft tissue injuries, and facial bone fractures, and treatment done were recorded in a preformed Proforma. The etiology of maxillofacial injuries was divided into RTA, fall, physical assault, industrial, and blast. Alcohol consumption by the patient at the time of trauma was also noted. Soft tissue injuries were classified as abrasion, contusion, laceration, and avulsion of the face. Fracture of the midface was divided into Lefort I, Lefort II, Lefort III, NOE, ZMC, infraorbital fracture, and dentoalveolar fracture. Fracture of the mandible was divided into different types based on its anatomical structures such as condyle, coronoid, ramus, angle, body, parasymphysis, symphysis, and dentoalveolar fracture. Associated injuries to other parts of the body were recorded as Head injuries, Orthopedicinjuries, Chest injuries, and Abdomen injuries. Data were entered in Microsoft Excel and analyzed by Statistical Package for Social Sciences (SPSS) version 23.

RESULTS

A total of 52 patients with maxillofacial injuries were studied. The age of patients ranged from 1 year to 73 years with a median age of 26 years. The majority of cases were in the third decade of life (38.4%, n=20) followed by the second decade of life (19.2%, n=10) and least in the age group above the sixth decade of life (3.9%, n=2) (Table 1). There were 69.2% (n=36) males and females 30.8% (n=16) with a male to female ratio of 2.25:1.

Table 1: Age wise distribution of patients (n=52)

Age (years)	Numbers (%)
Below 10	5 (9.7)
11-20	10(19.2)
21-30	20(38.4)
31-40	6(11.5)
41-50	4(7.6)
50-60	5(9.7)
Above 60	2(3.9)

The most common etiology was RTA (50%, n=26) followed by fall (34.7%, n=18)(Table 2). There were six (11.5%) patients that reported with physical assault and one (1.9%) reported with an industrial accident with a crusher. one (1.9%) reported with blast injuries due to the explosion of a liquefied petroleum gas cylinder. Alcohol consumption was associated with 23% (n=12) of maxillofacial injuries.

Table 2: Etiology of maxillofacial injuries (n=52)

Etiology	Numbers (%)
RTA	26(50)
Fall	18(34.7)
Physical assault	6(11.5)
Industrial	1(1.9)
Blast	1(1.9)

There were 41 soft tissue injuries among 36 patients. Isolated soft tissue injuries were seen in 24 patients. The most common soft tissue injury was laceration (70.7%, n=29) followed by abrasion (14.6%, n=6)(Figure 1). Contusion was seen in 9.8% (n=4) and avulsion of face in 4.9% (n=2).

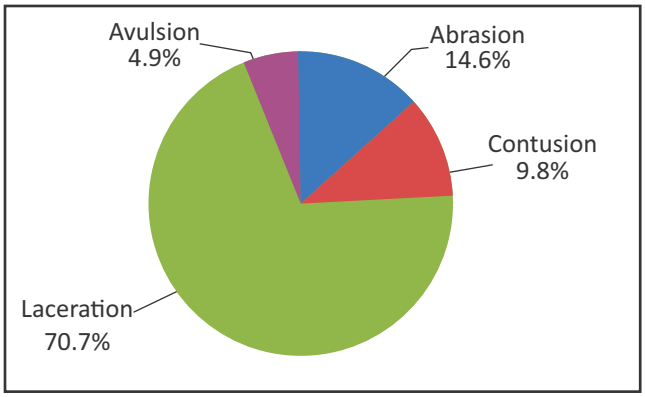

Figure 1: Pattern of soft tissue injuries

There were 28 patients with 43 facial bone fractures. The isolated bone fracture was seen in 15 patients. The most common fracture of the mandible was parasymphysis (23.8%, n=5) followed by symphysis (19%, n=4) (Table 3). Condylar fracture, body fracture, and mandibular dentolaveolar fracture were in equal percentage (14.3%, n=3). There was coronoid fracture in 9.5% (n=2) and ramus fracture in one 4.8% (n=1). Most common midface fracture was zygomaticomaxillary complex (ZMC) fracture (40.9%, n=9) followed by maxillary dentoalveolar fracture (27.3%, n=6). Lefort II and III fracture were in equal percentage each 9% (n=2). There was an equal percentage of Lefort I, NOE, and infraorbital fracture, each 4.6% (n=1). The maxillary dentoalveolar fracture (27.3%, n=6) was more common than mandibular (14.3%, n=3).

Table 3: Pattern of Facial bone Fracture

Pattern of Mandible fracture	Numbers (%)
Symphysis	4(19.0)
Parasymphysis	5(23.8)
Body	3(14.3)
Ramus	1(4.8)
Coronoid	2(9.5)
Condyle	3(14.3)
Dentoalveolar	3(14.3)
Total	21(100%)
Pattern of Midface fracture	**Numbers (%)**
Lefort I	1(4.6)
Lefort II	2(9.0)
Lefort III	2(9.0)
NOE	1(4.6)
ZMC	9(40.9)
Infraorbital	1(4.6)
Dentoalveolar	6(27.3)
Total	22(100%)

Out of 34 facial bone fractures excluding dentoalveolar fracture, 15(44.15%) were managed by open reduction and internal fixation (ORIF), 4 by closed reduction, and 15 conservatively. Dentoalveolar injuries were managed by splinting. All lacerations (n=29) were sutured under local anesthesia and avulsion of face (n=2) were sutured under general anesthesia. There were 12 patients with 16 associated injuries to other parts of the body. The most common associated injury was head injury (43.7%, n=7) followed by orthopedic and chest injuries each 25% (n=4) (Figure 2). Abdomen injuries was seen in one patient (6.3%) only.

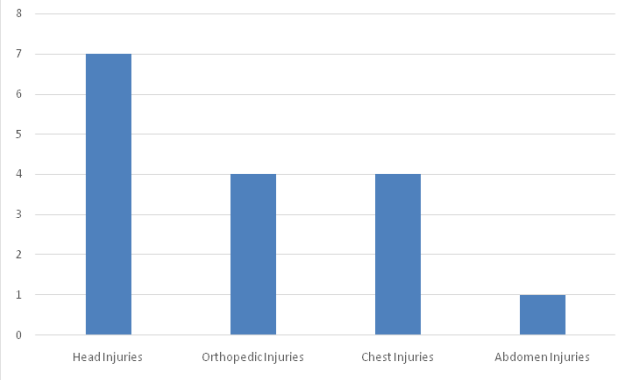

Figure 2: Associated injuries with Maxillofacial Injuries

DISCUSSION

COVID-19 has affected each and every field. Oral and maxillofacial surgery specialty have been affected by the COVID-19 pandemic as well. There have been changes in the maxillofacial practices according to various guidelines to combat COVID-19.[11,12] In our study, the majority of cases were in the third decade of life (38.4%, n=20) as found in other studies done in Nepal prior to the COVID-19 pandemic.[6,7,9] This age group is active and they have more responsibilities for the livelihood of their families so they have to venture out more compared to other age groups even in this pandemic. This age group has a phase of great personal independence, social excitement, and exposure to violence as well.[13,14] Findings of male to female ratio of 2.25:1 is similar to other studies of Khadka et al and Pradhan et al.[5,7] This may be due to our society being patriarchal, male have more responsibilities of family and have to go outdoors frequently. Male also have active social life and alcohol consumption habits that expose them to maxillofacial injuries.[15] In Southeast Asian countries RTA remains the most common etiology of maxillofacial injuries.[16,17,18] Chemma et al from Pakistan reported RTA (54%, n=382), similarly, Weihsin et al from India reported RTA (53%, n = 2347) to be the most common cause of maxillofacial injuries.[16,17] Another study from Bangladesh by Sultan et al have reported RTA (54.02%, n=235) as the most common cause of maxillofacial injuries.[18] We found RTA (50%, n=26) as the most common etiology followed by fall (34.7%, n=18) even in time of pandemic of COVID-19 which is in contrast to the study from china by GUO Yu-xuan et al. They had reported fall as the main etiology of maxillofacial injuries during the COVID-19 pandemic.[10] This may be due to their study duration of being less than one month and was carried out from 23 January to 20 February 2020 at the peak of the lockdown period. Another explanation could be due to lockdown not being properly followed in the initial phase and being partially removed after one and half months in Nepal. However the proportion of RTA have reduced and fall have increased compared to studies done in Nepal prior to the pandemic of COVID-19 as reported by Subedi et al (RTA 88%, fall 4.2%)and Biswari et al (RTA 64%, fall 16%).[4,6]

Alcohol consumption was associated with 23% (n=12) of maxillofacial injuries in our study. Alcohol consumption is known to increase crash likelihood due to reflex reduction, the abuse of velocity, and neglect of safety measures, and an increase in violent behavior.[19] The most common soft tissue injury was laceration (70.8%,n=29) similar to other studies.[7,20] In a similar study by Pradhan et al, 229 patients had various form of soft tissue injuries and lacerations (59.8%, n=137) was the most common soft tissue injuries.[7] Another study from Malaysia by Hussaini et al also reported laceration as the most common soft tissue injuries (69%, n=203).[20] Mandible (48.8%, n=21) is the most common site of facial bone fracture as in other studies.[5-7,9,21,22] Pandey et al studied a total of 1,108 patients with maxillofacial fractures and reported mandible as the most frequently fractured facial bone (33.57 %, n = 372).[22] Mandible is more susceptible to fracture because of its prominence and being the only movable facial bone. The most common fracture of the mandible was parasymphysis (23.8%,n=5) similar to other studies.[5-7,9,23] Adhikari et al reported parasymphysis (35%, n=42), as the most common site of mandible fracture.[23] The most common midface fracture was ZMC fracture (40.9%,n=9) in our study which is similar to study done by Subedi et al.[6] Subedi et al reported ZMC fracture in 67 (42%) patients. The prominent convex shape of zygoma makes it vulnerable to fracture.[24] The most common associated injury was head injury (43.7%,n=7) as seen in other studies.[7,9] Study done by Pradhan et al in Nepal have reported head injury in 58.7% (n=37) patients.[7]

Out of 34 facial bone fractures excluding dentoalveolar fracture, 19(54.2%) were managed by closed reduction and conservative management. Maxillofacial fracture management by open reduction and internal fixation is an aerosol generating procedure that is associated with an increased risk of transmission of the virus so, closed reduction and conservative management were preferred. Guidelines given by Arbeitsgemeinschaft für Osteosynthesefragen craniomaxillofacial (AO CMF) for COVID-19 Pandemic advocates closed treatment for maxillofacial fractures to reduce risk of COVID-19.[12]

CONCLUSION

The proportion of RTA to other etiologies of maxillofacial injuries has decreased. However, RTA still remains the most common etiology of maxillofacial injuries during this COVID-19 pandemic. The pattern of maxillofacial injuries has not changed much either in this COVID-19 pandemic.

RECOMMENDATIONS

Further multicenter studies with more sample size and duration are required to evaluate the accurate pattern of maxillofacial injuries during the COVID-19 pandemic.

LIMITATIONS OF THE STUDY

This study was done at a single center.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest

FINANCIAL DISCLOSURE

None

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