ORIGINAL ARTICLE

Pattern and Etiology of Mandibular Fractures Reported at Nepalgunj Medical College: A Prospective Study

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ABSTRACT

Background: Mandibular fracture is one of the most common fractures of the maxillofacial region. The pattern of mandibular fractures varies from country to country and these variations can be due to social, cultural, and environmental factors. **Objectives:** This study was conducted to evaluate the etiology, incidence and pattern of mandibular fractures in western region of Nepal, reported at Nepalgunj Medical College Teaching Hospital. **Methodology:** A prospective study of 130 patients with mandibular fractures was conducted in Department of Dentistry, Nepalgunj Medical College Teaching Hospital from November 2013 to November 2014. These patients were examined both using clinical and radiographic parameters for mandibular fracture. Data concerning age, gender, causes of fracture and sites of fracture were analyzed. **Result:** Out of 130 patients, 104(80%) were male patients and 26(20%) were female patients. Most common age group was between 21-30 years. Most common cause of mandibular fracture was road traffic accidents accounting for 66(50.77%) cases followed by fall injury in 30(23.08%) cases. Most common site involved was parasymphysis 46(30.47%) followed by angle 27(17.89%). Road traffic accidents due to alcohol consumption 40(68.97%) was the leading cause followed by assault 10(17.24%) and fall 8(13.79%). **Conclusion:** Mandibular fractures are more frequent in male than female with higher frequency in 21-30 years age group. The most commonly fractured site was the parasymphysis. Road traffic accidents were the most common etiology and significantly associated with alcoholism.

Key words: *Etiology, mandible fractures, pattern, road traffic accidents*

INTODUCTION

Though mandible is the largest and strongest facial bone it is fractured most frequently because of its prominent position, anatomic configuration, mobility and less bone support[1]. Mandibular fracture may not be life-threatening but immediate treatment should be applied because it is the only mobile bone of facial skeleton and it plays an important role in mastication, phonation, deglutition and maintenance of dental occlusion. Fracture mandible if not treated or incorrectly treated can lead to significant functional and aesthetic sequale including facial asymmetry, malocclusion, temporomandibular joint dysfunction and osteomylitis[2].

Mandibular fracture accounts for 36% to 54% of all fractures in the maxillofacial region. Etiology varies from country to country and they can usually be attributed to cultural, social, environmental and economic factors. Road traffic accident (RTA) is the leading cause of mandibular fracture in developing countries[3] whereas, interpersonal violence and physical assault is the leading cause in developed countries[4]. Alcoholism was found to be one of the major cause of mandibular fractures. The most common etiological factor for mandibular fracture in young adults is the road traffic accident and fall in the younger population.

Fracture site depends upon the mechanism of injury, magnitude and direction of impact force, prominence of the mandible and anatomy of site[5]. The aim of the present study was to assess common etiological factors, type of mandibular fracture and to suggest preventive measures to reduce incidence of these cases.

MATERIALS AND METHOD

A prospective study of 130 patients who reported with mandibular fracture to the Department of Dentistry, Nepalgunj Medical College Teaching Hospital (NGMCTH) from November 2013 to November 2014 was undertaken. Approval of hospital ethical review committee was taken. After taking an informed consent, thorough history was taken. Detailed clinical examination was done for each patient, and diagnosis was made on the basis of history, signs and symptoms, clinical findings and using conventional as well as contemporary radiographic techniques like CT scan. Types of fractures were studied and recorded as symphysis, parasymphysis, body, angle, ramus, condyle and coronoid fractures. Etiological factors were classified as Road Traffic Accidents, fall, assault and sports injuries or other injuries.

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Data regarding influence of alcohol was also noted. Whether injured person was drunk at the time of accident or alchohol was involved in assault or fall was noted. The data obtained were then analyzed.

All patients lying in the age group of 1-70 years with mandibular fractures were included in this study. Medically compromised patients, previously maltreated or untreated mandibular fracture and other facial skeletal fractures were excluded from this study.

RESULT

A total of 130 patients presenting mandibular fracture aged between 1 to 70 years reported to the Department of Dentistry, NGMCTH from November 2013 to November 2014 were included in this study. Most of the patients were male 104(80%) while only 26 were females accounting only 20% of the cases. The prevalence of mandibular fracture was higher in male of all age groups, with an overall male-to-female ratio of approximately 4:1.

Gender	No. of patients
Male	104
Female	26
Total	130

Table I: Distribution of mandibular fractures according to gender

The age group ranged from 1 year to 70 years. We found a peak occurrence of mandibular fracture in young adults, aged 21-30 years (n=42, 32.30%) here n is total number of cases. This was followed by 11-20 years (n=25, 19.23%), 31-40 years (n=23, 17.7%), 41-50 years age group (n=18, 13.85%), 1-10 years (n=15, 11.54%), and 51-60 years (n=4, 3.85%). Patients belonging to 61-70 years were the least involved group (n=2, 1.53%). Amongst males, 21-30 years group were the most frequently involved followed by 11-20 years whereas in females 21-30 years age group was most common followed by 31-40 years.

The most common cause of mandibular fractures was RTA (n=66, 50.77%) followed by fall (n=30, 23.08%), assault (n=25, 19.23%), sports injury (n=5, 3.85%) and other causes (n=4, 3.07%).

Etiology	No. of patients	Percentage (%)
RTA	66	50.77
Fall	30	23.08
Assault	25	19.23
Sports	5	3.85
Other causes	4	3.07
Total	130	100

Table III: Distribution of mandibular fractures according to etiology

Alcohol consumption is a well-known contributing factor to trauma and highest number of mandibular fractures because of alcohol consumption were due to RTA (n=40, 68.97%) followed by assault (n=10, 17.24%) and fall (n=8, 13.79%)

Etiology	No. of patients	Percentage (%)
RTA	40	68.97
Fall	8	13.79
Assault	10	17.24
Total	58	100

Table IV: Distribution of mandibular fractures according to influence of alcohol

A total of 151 fractures were sustained by 130 patients. As some patients presented with more than one fracture sites. The most common site of mandibular fracture was parasymphysis (n=46, 30.47%) followed by angle (n=27, 17.89%) and body (n=25; 16.55%). Combination or multiple fractures were seen in (n=24, 15.89%) while condyle (n=18, 11.92%), symphysis (n=10, 6.625) and coronoid (n=1, 0.66%) were the least common fracture sites.

AGE	MALE	FEMALE	TOTAL	%
1-10	12	3	15	11.54
11-20	21	4	25	19.23
21-30	33	9	42	32.30
31-40	18	5	23	17.7
41-50	14	4	18	13.85
51-60	4	1	5	3.85
61-70	2	0	2	1.53
Total	104	26	130	100

Table II: Distribution of mandibular fractures according to age

Site	No. of patients	Percentage (%)
Symphysis	10	6.62
Parasymphysis	46	30.47
Body	25	16.55
Angle	27	17.89
Condyle	18	11.92
Coronoid	1	0.66
Combination more than one site	24	15.89
Total	151	100

Table V: Distribution of mandibular fractures according to site

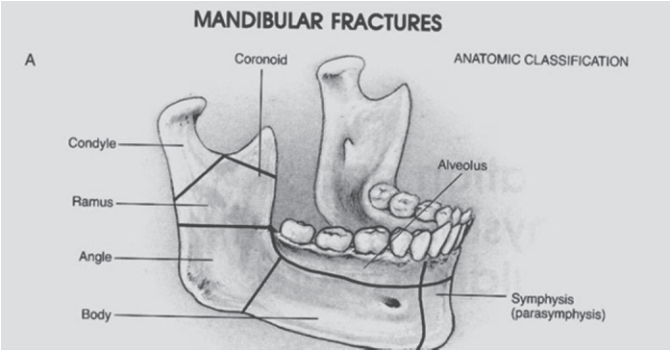

Figure 1: Fracture site according to anatomic location

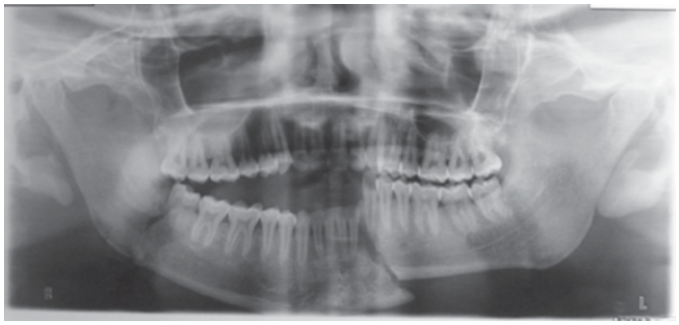

Figure 2: X-ray film showing fracture at left parasymphysis and right angle of mandible

DISCUSSION

In the present study, incidence of mandibular fracture was more common in males with male: female ratio of 4:1 and this can be expected since men are more involved in outdoor activities and are also exposed to violent interactions as compared to females who are less exposed due to social and religious limitations in this region. This finding was consistent with the studies conducted by Kamali U et al.[6] and Ansari et al[7].

It was also observed that mandibular fractures predominantly occurred in the age group of 21-30 years followed by 11-20 years. The high incidence in this age group can be contributed to the fact that people belonging to this age group are more active socially, in business, sports and high speed transportation, which make them more vulnerable. A lower frequency of mandible fracture is seen at very young age which can be due to high elasticity of bone, poor pneumatization (by sinuses), thick surrounding adipose tissue and internal stabilization by unerupted teeth within maxilla and mandible. In very old age group, probably due to lower physical activities, mandibular facture is least common. Similar finding was noted in the study conducted by Abbas et al[8].

In the present study, the most common site of fracture was the parasymphysis, followed by angle of the mandible. Long canine root and unerupted wisdom tooth can be said to make parasymphysis and angle more prone to fracture[9]. Assault and interpersonal violence due to alcohol abuse and use of illicit drug are the contemporary causes of mandibular fractures in developed countries[10,11]. Road traffic accidents were by far the most common cause of mandibular fractures seen in this region of Nepal. Epidemiological study by Khan A et al[12] reported similar findings about cause of maxillofacial injuries in developing countries. The high number of road traffic accidents in our country may be due to the lack of inadequate road safety awareness, violation of speed limit, bad conditions of vehicles, over loading and bad conditions of roads and use of alcohol while driving.

It was also observed that majority of road traffic accidents took place while the person involved was under the influence of alcohol. Mittal et al[13] also found that alcoholism as one of the major cause of mandibular fractures. This may reflect the deleterious effects of alcohol on psychomotor skills and the lack of preventive mechanisms to respond to situational hazards.

CONCLUSION

Our study concludes that mandibular fractures were more frequently observed in young adult male (21-30 years). The most common etiological factor was RTA followed by fall and assault. There is an increased incidence of RTA due to alcohol consumption. The most commonly fractured site was the parasymphysis.

As there is high frequency of mandibular fractures due to road traffic accidents there should be strict compliance of traffic rules and regulations. Preventive strategies remain the cheapest way to reduce the sequelae of mandibular fractures. However, further research work on large population with a bigger sample size and more data would certainly help to conclude the findings.

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