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The Patterns and Etiology of Maxillofacial Injuries in Tertiary Care Hospital in Lucknow

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Abstract

Introduction: Maxillofacial injuries are one of the commonest presentations in emergency department. Most common etiological factor for maxillofacial injuries is road traffic accident (RTA). Smell, hearing, sight, breathing, eating and facial expression are all ruminate by face hence maxillofacial injuries requires immediate repairs and reconstruction. The aim of the present study was to assess the pattern and etiology of maxillofacial injury at tertiary care hospital in Lucknow, India.

Materials and methods: The present study was a two years retrospective study based on medical records of the patients who came in emergency department from January 2021 to December 2022. Various demographic data such as age, sex, etiology, nature and mechanism of injury, site of injury and types of injury were included in the study.

Results: Out of 108 cases 86 were male and 22 were female with male and female ration of 4:1. Men were significantly more sufferer of maxillofacial injuries than female. Most of cases were in the age group of 21 to 30 years and constitute 39.8% of all maxillofacial injuries Most common etiology for maxillofacial injuries was RTA (65.7%). Among RTA case motorcycle/scotty accident was most common (46.4%) Most common maxillofacial injuries was mandible (42.5%) followed by fracture of zygomatic bone (27.7%) Fracture of para symphysis (34.8%) was most common mandibular fracture and Lefort type I was most common maxillary fracture (37.5%). 49% of cases of maxillofacial injuries were treated with open reduction internal fixation, 36% were treated with closed reduction and rest were treated with conservative management

Conclusions: Male in age group of 20-30 years were most commonly affected in maxillofacial injuries. RTA were most common etiology for maxillofacial injury. Safety awareness programme, strict fulfilment of traffic rule, safe and defensive riding can be foremost protection against maxillofacial injuries.

Keywords: Etiology, Pattern, Maxillofacial injuries, Mandibular, Maxillary, Percentage

Abbreviations: RTA: Road traffic accident

Introduction

Maxillofacial injuriesexhibit big challenges to health system throughout the world because of its increasing incidence and various types of associated damages such as physical, functional and esthetic[1,2]. Maxillofacial injuries are one of the commonest presentations in emergency department[3]. Though the incidence of maxillofacial injuries is same but the pattern of maxillofacial injuries differs in different countries[4]. Most common etiological factor for maxillofacial injuries is road traffic accident (RTA) followed by physical assaults, falls, sports injuries, animal attack, industrial accident, fire arm injuries etc[5,6,7,8,9,10]. These etiological factors determined by varieties of factors such as road traffic legislation, alcohol intoxication, socioeconomic factors,cultural factors, geographical area and climatic conditions and thus these factors may dispense maxillofacial trauma[11,12]. Maxillofacial injuries entails special attention since it is in close adjacency to respiratory passage, brain and other important vital organ. Maxillofacial injuries often associated with dangerous concussion injury like traumatic brain injury.[13,14].Smell, hearing, sight, breathing, eating and facial expression are all ruminate by face hence maxillofacial injuries requires immediate repairs and reconstruction[15].Etiology of maxillofacial injuries may give behavioural pattern of a person since it varies from place to place. It may help in preventive perspective for decreasing the incidence of maxillofacial trauma[12,16]. The aim of the present study was to assess the pattern and etiology of maxillofacial injury at tertiary care hospital in Lucknow, India.

Materials and methods

Institutional ethical clearance was taken for this study with reference number IEC/IIMS&R/2023/76 (Institutional Ethics Committee, IIMS&R Integral University, Lucknow). The present study was a two years retrospective studybased on medical records of the

patients who came in emergency department of Integral Institute of medical sciences & research, Lucknow from January 2021 to December 2022. Various demographic data such as age, sex, etiology, nature and mechanism of injury, site of injury and types of injury were included in the study. Medical records having insufficient data were excluded from the study.Data entered in excel sheet and were quantified and analysed statistically using SPSS (Statistical Package for the Social Sciences).

Results

A total of 108 patients were treated for their maxillofacial injuries from time period of January 2021 to December 2022. Out of 108 cases 86 were male and 22 were female with male and female ration of 4:1(Table1, chart 1). Men were significantly more sufferer of maxillofacial injuries than female. Most of cases were in the age group of 21 to 30 years with 43 cases (34 male and 9 female) and constitute 39.8% of all maxillofacial injuries (Table 2, chart 2). Most common etiology for maxillofacial injuries was RTA (65.7%) followed by interpersonal violence (22.22%) (Table 3, chart 3). Among RTA case motorcycle/scotty accident was most common (46.4%) followed by motor vehicle accident (23.9%) (Table 4, chart 4). Most common maxillofacial injuries werefracture of mandible (42.5%) followed by fracture of zygomatic bone(27.7%) followed by fracture of maxilla(18%) (Table 5, chart 5). Fracture of para symphysis was most common mandibular fracture accounting 34.8 % of overall mandibular fracture (Table 6, chart 6). Fracture of maxilla was shown in Table 7 and chart 7. Lefort type I was most common maxillary fracture(37.5%) followed by dentoalveolar fracture (33.3%). Out of 108 cases of maxillofacial injuries, 36(33.3%) cases were isolated maxillofacial injury and rest were associated with other injuries like orthopaedic injuries(42.7%), head injuries(17.6%), spine injuries(3.7%), abdominal injuries(1.8%) and thoracic injuries(0.9%) (Table 8, chart 8). 49% of cases of maxillofacial injuries were treated with open reduction and internal fixation, 36% were treated with closed reduction and rest was taken conservative management (Table 9, chart 9).

Sex	Maxillofacial injuries
Male	86
female	22

Table 1: Sex distribution of maxillofacial injuries

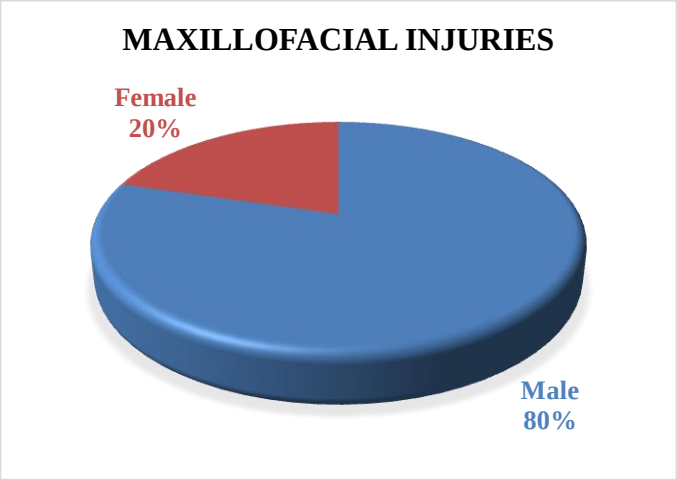

Chart 1: Sex distribution of maxillofacial injuries

Age group of the cases	Male	Female	Total number of cases	Percentage of cases
01-10	2	1	3	2.8
11-20	12	3	15	13.8
21-30	34	9	43	39.8
31-40	28	4	32	29.6
41-50	6	2	8	7.4
51-60	2	2	4	3.8
61-70	2	1	3	2.8

Table 2: Age group and sex distribution of maxillofacial injuries

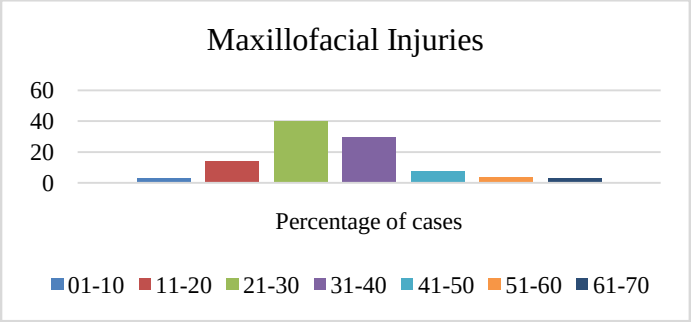

Chart 2: Age group distribution of maxillofacial injuries

Etiology	Number of cases	Percentage
RTA	71	65.7
Interpersonal violence	24	22.22
Fall	6	5.55
Sports injury	5	4.62
Injury due to animal	2	1.85

Table 3: Etiology of maxillofacial injuries

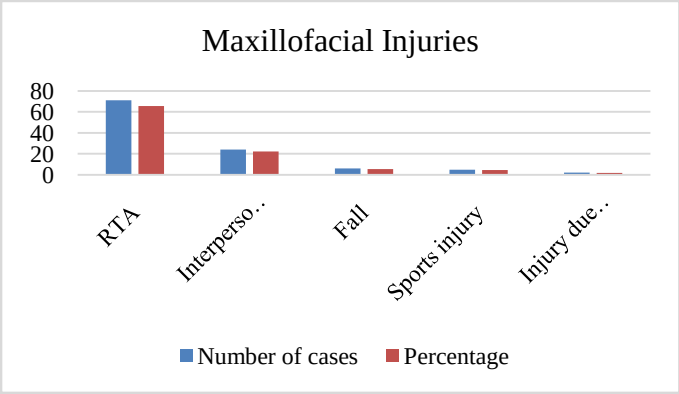

Chart 3: Etiology of maxillofacial injuries

Types of RTA	Number of cases	Percentage
Motor cycle/scotty	33	46.4
Motor vehicle	17	23.9
Pedestrian	9	12.7
Three-Wheeler	4	5.6
Bicycle	3	4.3
Auto	3	4.3
Rickshaw	2	2.8

Table 4: Types of RTA in maxillofacial injuries

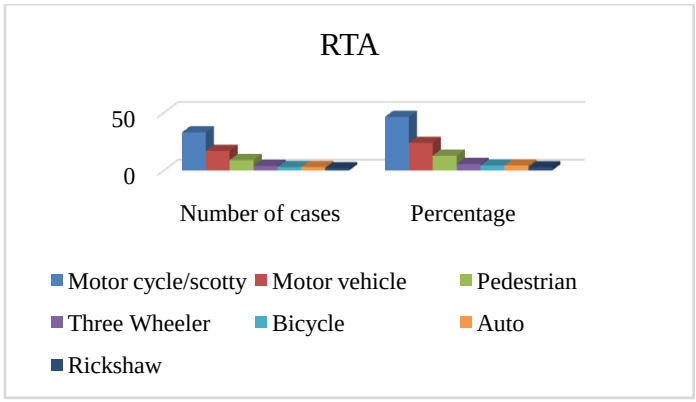

Chart 4: Types of RTA in maxillofacial injuries

Site of fracture	Number of cases	Percentage
Mandible	46	42.5
Zygomatic	30	27.7
Maxilla	18	16.6
Infraorbital	8	7.4
Nasal	6	5.6

Table 5: Site of maxillofacial fracture

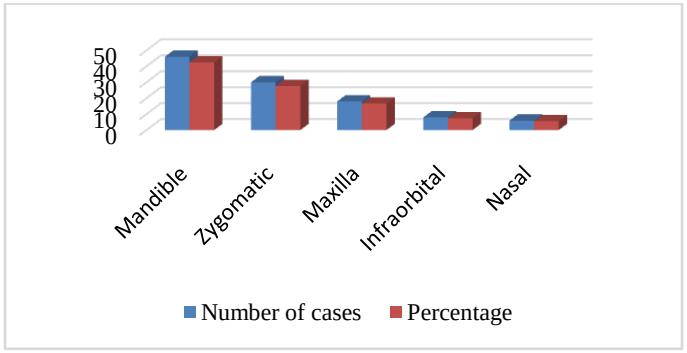

Chart 5: Site of maxillofacial fracture

Distribution of mandibular fracture	Number of cases	Percentage
Condylar	1	2.1
Coronoid	8	17.5
Ramus	2	4.3
Angle	7	15.3
Body	5	10.8
Para symphysis	16	34.8
Symphysis	4	8.7
Dentoalveolar	3	6.5

Table 6: Distribution of various mandibular fracture

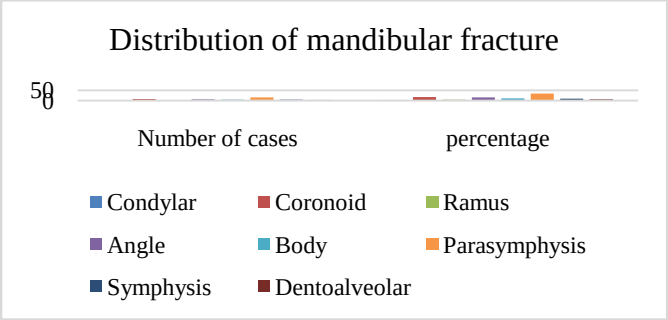

Chart 6: Distribution of various mandibular fracture

Distribution of maxillary fracture	Number	Percentage
Dentoalveolar	4	33.3
Lefort I	6	37.5
Lefort II	7	20.8
Lefort III	1	8.4

Table 7: Distribution of various maxillary fracture

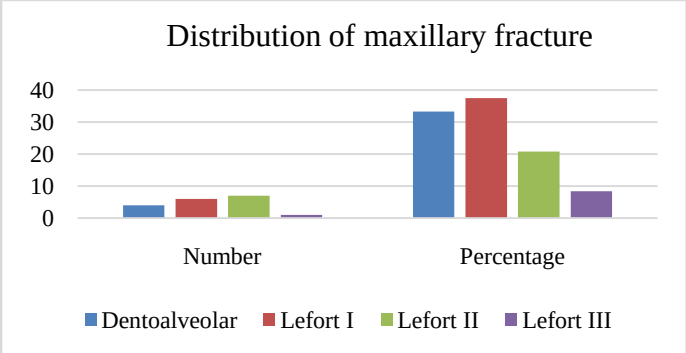

Chart 7: Distribution of various maxillary fracture

Associated injuries	Number of cases	Percentage
Isolated maxillofacial injury	36	33.3
Head injury	19	17.6
Spine injury	4	3.7
Abdominal injury	2	1.8
Thoracic injury	1	0.9
Orthopaedic injury	46	42.7

Table 8: Associated injuries with maxillofacial injuries

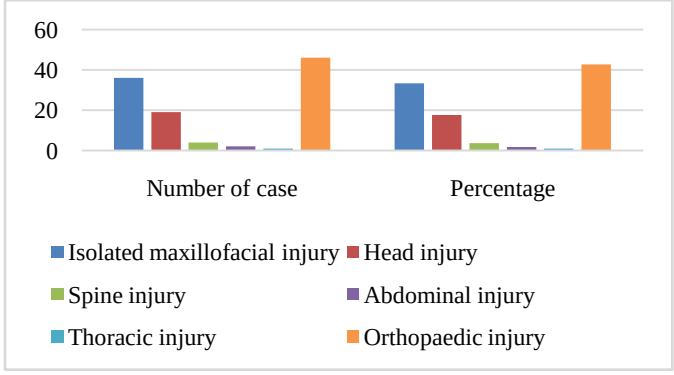

Chart 8: Associated injuries with maxillofacial injuries

Treatment taken	Number of cases	Percentage
Conservative	16	15
Closed Reduction	39	36
Open reduction	53	49

Table 9: Treatment given to the patient of maxillofacial injuries

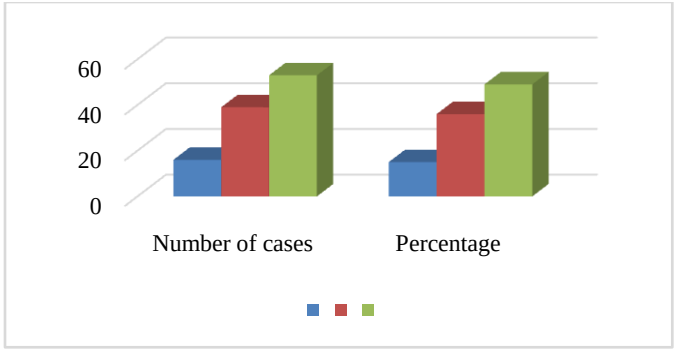

Chart 9: Treatment given to the patient of maxillofacial injuries

Discussion

Trauma is major cause of mortality below 40 years of age[10]. Maxillofacial injuries are commonest injuries following trauma since face is highly exposed to various type of injuries[17,18,19]. In our study highest sex prevalence was for male which was similar with the many studies[20,21,22,23,24,25]. Greater prevalence of male was due to their such activities like sport activity, vehicle driving, more social active life, alcohol and drug abuses[26]. Most common age group of maxillofacial injuries in our study was 21-30 years which was similar

with finding of other studies[1,6,26,27,28,29]. The possible cause for this age group is due to emotional conflict and behavioural changes which this age group faces. This age group is period of social excitement, self-dependency, excessive mobility, fast and careless driving[26,29,30,31,32]. The most common cause of maxillofacial injuries in our study was due to RTA and most common cause for RTA was motorcycle/scotty accident. These finding are consistent with the many studies carried out in India and globally[26,29,33,34,35]. Greater number of RTA in developing countries may accredit to driving without helmet, driving without seat belt, road sharing by animal, traffic rule violation, low standard roads, poor maintenance of vehicle, driving while using mobile phone and large number of motorcycle/scottyor other vehicles on the roads[26,36,37]. Most common bone fractured in our study was mandible which was consistent with many studies[6,33,38,39,40,41]. This may be attributed to fact that mandible is most movable, most prominent facial bone and hence greater exposure to injuries[24,25]. Zygomatic bone fracture was second most common facial bone involved in maxillofacial injuries and which can be attributed to its multiple articulation and its projection making zygomatic bone at risk of fracture[25,42].Most common site of mandibular fracture in this study was para symphysis which was similar with finding of Snehal et al[43] and Praveen Lone et al[26]. In contrast to our finding, Arther Nawashindi et al[24] and Mubashir Younis& Manoj Bhaskaran[25]found body of mandible for most common site for mandibular fracture. Most common maxillary fracture in our study was Lefort I which was similar with the finding of Arther Nawashindi et al[24]whereas, Mubashir Younis& Manoj Bhaskaran[25] and Shafi Ullah Khan et al[44]found Lefort II being most common maxillary fracture and Praveen Lone et al[26] found dentoalveolar being most common maxillary fracture. Maxillofacial injuries were not always isolated, it often associated with other injuries. In our study only 36% cases were of isolated maxillofacial injuries where as 46% cases were associated with orthopaedic injuries (most common associated injury) and 19% cases were associated with head injuries, 4% cases associated with injury of spine, 2% with abdominal injuries and 1% case associated with thoracic injury whereas, Mubashir Younis& Manoj Bhaskaran[25]in their study found, associated injuries in 33.51% of patients out of which brain injury was the most common (58.73%) and others were related to orthopaedics (23.81%), ophthalmology (14.29%) and general surgery (3.17%) and the findings were consistent with previous data. In our study 15% patients managed conservatively, 36% treated with closed reduction and 49% of patient were treated with open reduction internal fixation.

Conclusions

Male in age group of 20-30 years were most commonly affected in maxillofacial injuries. RTA were most common etiology for maxillofacial injury. Most common RTA were of motorcycle/scotty accident. Safety awareness programme, strict fulfilment of traffic rule, safe and defensive riding can be foremost protection against maxillofacial injuries.

References

1. Brasileiro BF, Passeri LA. Epidemiological analysis of maxillofaclalfractures in Brazil: A 5-year prospective study. Oral Surg Oral Med OralPathol Oral RadiolEndod 2006;102:28-34.
2. Alvi A, Doherty T, Lewen G. Facial fractures and concomitant injuriesin trauma patients. Laryngoscope 2003;113:102-6.

3. Abosadegh MM, Saddki N, Al-Tayar B, Rahman SA. Epidemiology of MaxillofacialFractures at a Teaching Hospital in Malaysia: A Retrospective Study. Biomed Res Int 2019; 10. 1155/2019/9024763.
4. Agarwal P, Mehrotra D, Agarwal R, Kumar S, Pandey R. Patterns of Maxillofacial Fractures in Uttar Pradesh, India. Craniomaxill of Trauma Reconstruct. 2017;10(01):48-55.
5. Tu AH, Girotto JA, Singh N, et al: Facial fractures from dog bite injuries. PlastReconstrSurg 109:1259, 2002
6. Erol B, Tanrikulu R, Görgün B. Maxillofacial fractures: Analysis of demographic distribution and treatment in 2901 patients (25-year experience). J CraniomaxillofacSurg 2004; 32:308-13.
7. Ugboko VI, Olasoji HO, Ajike SO, et al: Facial injuries caused by animals in northern Nigeria. Br J OralMaxillofacSurg 40:433, 2002
8. Zaleckas L, Pečiulienė V, Gendvilienė I, Pūrienė A, Rimkuvienė J. Prevalence and etiology of midfacial fractures: A study of 799 cases. Medicina (Kaunas) 2015; 51:222-7.
9. Chrcanovic BR. Factors influencing the incidence of maxillofacial fractures. Oral MaxillofacSurg 2012; 16:3-17.
10. Gassner R, Tuli T, Hächl O, Rudisch A, Ulmer H. Cranio-maxillofacial trauma: a 10-year review of 9543 cases with 21067 injuries. J Cranio-Maxillofacial Surg 2003; 31:51–61.
11. Khan AA: A retrospective study of injuries to the maxillofacial skeleton in Harare,Zimbabwe. Br J Oral MaxillofacSurg 26: 435, 1988
12. Telfer MR, Jones GM, Shepherd JP: Trends in the aetiology ofmaxillofacial fractures in the United Kingdom (1977-1987). Br JOralMaxillofacSurg 29:250, 1991.
13. Rajandram RK, Syed Omar SN, Rashdi MF, Abdul Jabar MN. Maxillofacial injuries and traumatic brain injury--a pilot study. Dental Traumatology: Official Publication of International Association for Dental Traumatology 2014; 30:128-132.
14. Abosadegh MM, Rahman SA, and Saddki N. Association of traumatic head injuries and maxillofacial fractures: A retrospective study. Dental Traumatology: Official Publication of International Association for Dental Traumatology 2017; 33:369–374.
15. Wilson JN. Watson- Jones fractures and joint injuries. 6th ed. New Delhi: B.I. Churchill Livingstone; 2000: 162.
16. Olasoji HO, Tahir A, Arotiba GT: Changing picture of facial fractures innorthern Nigeria. Br J Oral MaxillofacSurg 40:140,2002.
17. W. L. Adeyemo, A. L. Ladeinde,M. O. Ogunlewe, and O. James, "Trends and characteristics of oral and maxillofacial injuries in Nigeria: a review of the literature," Head & Face Medicine, vol. 1, article 7, 2005.
18. I. Abbas and K. Ali, "Management of mandibular fractures—a prospective study," Pakistan Oral & Dental Journal, vol. 22, no. 2, pp. 151–152, 2002.
19. Van den Bergh B, Karagozoglu KH, Heymans MW, Forouzanfair T. Aetiology and incidence of maxillofacial trauma in Amsterdam: a retrospective analysis of 579 patients. Journal of Cranio-Maxillofacial Surgery. 2012; 40:165-169.
20. El-Sheikh MH, Bhoyar SC, Emsalam RA. Mandibular fractures in Benghazi Libya: A

retrosoective analysis. J Indian Dent Assoc 1992;63:367-70.

21. Kieser J, Stephenson S, Liston PN, Tong DC, Langley JD. Serious facialfractures in New Zealand from 1979 to 1998. Int J Oral MaxillofacSurg2002;31:206-9.
22. Veeresha KL, Shankararadhya MR. Analysis of fractured mandible andfractured middle third of the face in road traffic accidents. J Indian DentAssoc 1987;59:150-3.
23. Hamid MM, Jabir A, Fathi A, Mohieeldin A,Hamid MM. Pattern and etiology of maxillofacial trauma among Sudanesepopulation. J Head Neck Physicians Surg 2020;8:87-90.
24. Nwashindi A, Dim EM, Uduma FU, Akhiwu BB.Pattern of maxillofacial fractures in uyo, southern Nigeria. Int J Adv Med HealthRes 2015;2:91-4.
25. Younis M, Bhaskaran M. Prevalence and patterns of maxillofacial fractures - a retrospective descriptive study of 188 cases. International Journal of Contemporary Medical Research 2020;7(9):I1-I4.
26. Lone P, Singh P, Kour I, Kumar M. A 2-year retrospective analysis of facial injuries in patients treated at department of oral and maxillofacial surgery, IGGDC, Jammu, India. Natl J MaxillofacSurg 2014; 5:149-52.
27. Bakardjlev A, Pechalova R. Maxillofacial fractures in SouthernBulgaria - A retrospective study of 1706 cases. J CraniomaxillofacSurg2007;35:147-50.
28. Al Ahmed HE, Jaber MA, Abu Fanas SH, Karas M. The pattern ofmaxillofacial fractures in Sharjah, United Arab Emirates: A reviewof 230 cases. Oral Surg Oral Med Oral Pathol Oral RadiolEndod2004;98:166-70.
29. Chandra Shekar BR, Reddy C. A five-year retrospective statistical analysisof maxillofacial injuries in patients admitted and treated at two hospitalsof Mysore city. Indian J Dent Res 2008;19:304-8.
30. Lee KH, Snape L, Steenberg LJ, Worthington J. Comparison between interpersonal violence and motor vehicle accidents in the aetiology of maxillofacial fractures. ANZ J Surg 2007;77:695-8.
31. Motamedi MH. An assessment of maxillofacial fractures: A 5-year study of 237 patients. J Oral MaxillofacSurg 2003;61:61-4.
32. Bataineh AB. Etiology and incidence of maxillofacial fractures in the north of Jordan. Oral Surg Oral Med Oral Pathol Oral RadiolEndod 1998;86:31-5. maxillofacial fractures. ANZ J Surg 2007;77:695-8.
33. Subhashraj K, Nandakumar N, Ravindran C. Review of maxillofacial injuries in Chennai, India: A study of 2748 cases. Br J Oral MaxillofacSurg 2007; 45:637-9.
34. Wiwekananda ABW, Arimbawa IW, Roosseno RRN. The characteristics and patterns of maxillofacial fractures at Mangusada general hospital, Badung-Bali. Int J Res Med Sci 2019;7:2318-22.
35. Mittal S, Dall TS, Kapoor S, Mittal R. A study of pattern of maxillofacial fractures and its complications. Int Surg J 2020;7:1752-7.
36. Park K. Epidemiology of chronic non-communicable diseases. Textbook of Preventive and Social Medicine. 17th ed. BanarsidasBhanot publishers, Jabalpur; 2005. p. 303-7.
37. Rodrigues EM, Concha-Eastman A. Pan-American Conference on Security in Transit-Health Sector

Responses to challenge for a transit insurance in the Americas (in Portuguese). Brasilia: Pan American Health Organization; 2005. p. 1-31.

38. Motamedi MHK, Dadgar E, Ebrahimi A, Shirani G, Haghighat A, Jamalpour MR. Pattern of maxillofacial fractures: a 5-year analysis of 8818 patients. J Trauma Acute Care Surg. 2014;77:630–4.
39. Ramdas S, Lingam PP, Sateesh S. Review of Maxillofacial Fractures in a Tertiary CareCentre in Puducherry, South East India. Ann Trop Med Public Health 2014; 7:100-4.
40. Kamulegeya A, Lakor F, Kabenge K. Oral maxillofacial fractures seen at a Ugandan tertiary hospital: A six-month prospective study. Clinics (Sao Paulo) 2009;64:843-8.
41. Mohammed S, Firas A, Sukaina R, Ameen K. Trends in the pattern of facial fractures in different countries of the world. Int J Morphol 2012;30:745-56.
42. Schneider D, Kammerer PW, Schon G, Dinu C, Radloff S, Bschorer R. Etiology and injury patterns of maxillofacial fractures from the years 2010 to 2013 in Mecklenburg- Western Pomerania, Germany: A retrospective study of 409 patients. J Craniomaxillofac Surg. 2015; 43:1948-1951.
43. Snehal B, Sanjay J, Anshul K, Ajit M, Sarbani DS, Vikas M. Incidences, etiology, fracture patterns and geographical distribution of maxillofacial injuries reported at Government Dental College and Hospital, Raipur, Chhattisgarh state, India. Chhattisgarh J Health Sci 2013;1:28-31.
44. Khan SU, Khan M, Khan AA, Murtaza B, Maqsood A, Ibrahim W. Ahmed W. Etiology and pattern of maxillofacial injuries in the Armed Force of Pakistan. JColl Physicians Surg Pak. 2007 Feb;17(2). PMID:17288855.