

Evaluation of changing patterns in maxillofacial trauma - our experience -A retrospective study

¹Dr. Prachur Malhotra, MDS, Professor, Dept of Oral and Maxillofacial Surgery, K. M. Shah dental College and Hospital.

²Dr. Debasish Sinha, MDS, Dept of Oral and Maxillofacial Surgery, Private Practitioner, K. M. Shah Dental College and Hospital.

³Dr. Sonal Arora, Private Practitioner, Dept of Oral and Maxillofacial Surgery, K. M. Shah Dental College and Hospital.

⁴Dr. Apurv Shah, Senior Lecturer, Dept of Oral and Maxillofacial Surgery, K. M. Shah Dental College and Hospital.

⁵Dr. Saurabh Chandalia, Resident, Dept of Oral and Maxillofacial Surgery, K. M. Shah Dental College and Hospital.

⁶Dr. Sonal Sinha, Resident, Dept of Oral and Maxillofacial Surgery, K. M. Shah Dental College and Hospital.

Corresponding Author: Dr. Prachur Malhotra, MDS, Professor, Dept of Oral and Maxillofacial Surgery, K. M. Shah Dental College and Hospital.

Citation of this Article: Dr. Prachur Malhotra, Dr. Debasish Sinha, Dr. Sonal Arora, Dr. Apurv Shah, Dr. Saurabh Chandalia, Dr. Sonal Sinha, “Evaluation of changing patterns in maxillofacial trauma - our experience -A retrospective study”, IJDSIR- June - 2022, Vol. – 5, Issue - 3, P. No. 503 – 509.

Copyright: © 2022, Dr. Prachur Malhotra, et al. This is an open access journal and article distributed under the terms of the creative commons attribution non-commercial License. Which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Injuries to the face, head, and neck are relatively common, but in the overall trauma literature, the etiology of maxillofacial injuries has received relatively little consideration. Almost all injuries result from some form of trauma, which may be defined as a physical force resulting in injury. Injuries may likewise be the result of chemical, thermal, or even radiation trauma, yet these happen far less normally than physical injury. Despite the high incidence of facial injuries, there has been relatively little research until recently into their etiology, treatment, and prognosis.

Materials and methods: All the patients who reported to the Department of Oral and Maxillofacial Surgery, K. M. Shah Dental College, Vadodara, Gujarat and Dhiraj

General Hospital, Vadodara, Gujarat between January 2011 to December 2017 were included in the study were retrospectively reviewed and analyzed the patient records using the hospital database. Age, gender distribution, etiology of injury, fracture pattern was retrieved for this study. The etiological factors were categorized as RTA, fall, assault, sports injury and others. The study was designed in accordance with the ethical guidelines of Helsinki and was reviewed and approved by Sumandeep Vidyapeeth Institutional Ethics Committee (SVIEC).

Result: A total of 620 patients’ data was collected of which 541 were male and 79 were female with a ratio of 6.95:1. Among the different etiological variables

responsible for maxillofacial injuries Road Traffic Accidents were found to be the major cause (58.4%)

Conclusion: Dissimilar to in most developed nations where assaults have supplanted road traffic accidents as the significant reason for the injuries, in India no evident move from road traffic accidents as the main source of maxillofacial injuries was noted. These discoveries should likewise alarm the experts, especially the administration and the Road Safety Commission to the requirement for the arrangement of good streets and traffic direction.

Keywords: Trauma, Etiology, Maxillofacial Trauma.

Introduction

Injuries to the face, head, and neck are relatively common, but in the overall trauma literature, the etiology of maxillofacial injuries has received relatively little consideration. Almost all injuries result from some form of trauma, which may be defined as a physical force resulting in injury. Injuries may likewise be the result of chemical, thermal, or even radiation trauma, yet these happen far less normally than physical injury. Despite the high incidence of facial injuries, there has been relatively little research until recently into their etiology, treatment, and prognosis.

Injury has customarily been grouped by anatomic site. Even though this is a coherent methodology on which to base treatment, as far as creating procedures to anticipate damage it is more instructive to consider the etiology and the applied forces that produce injuries of differing types. Examples of damage can be depicted that identify with specific sorts of mishaps, and it is imperative to comprehend these examples in connection to criminological proof. In addition, techniques to diminish the rate of maxillofacial wounds should be created, in light of the fact that the expense of treatment of these wounds can be high.

The classification of maxillofacial trauma can be considered with respect to etiology under a variety of headings, including assaults, falls, industrial injuries, RTAs, animal bites, sports injuries, burns, and war injuries. Other categories could also be included, such as iatrogenic and self-inflicted injuries. Various etiological factors are responsible for maxillofacial trauma and there is change in trend noted along the years. Road Traffic Accident being the most prevalent factor in developing countries. Other etiologies include physical assault, injuries due to fall, sports injuries and animal attacks. Various researches have been done around the world about varied patterns of maxillofacial trauma but different variables make it difficult to evaluate the demographic data. It is necessary to assess the variations and patterns of the change in etiology as it helps in introduction and inculcation of the new laws and suggests new ways in prevention of the injuries. Some of these ways include introduction of the airbags in cars, strict rules to wear seat belts and helmets.

In Western countries, the highest rate of maxillofacial trauma in many studies occurred during the 15 years following World War II. In the developing world, RTAs still account for the majority of maxillofacial trauma. There are variations in the trend noted amongst developed and developing countries. Despite the fact that Adi et al. discovered that injuries from fall were the second most common reason for mandibular fractures, it is perceived that many assaulted patients report that their injuries are because of falls. Road accidents have before, been the most incessant reason for facial fractures in numerous nations including Nigeria, Libya, Europe, and the US. [http://www.ijdr.in/article.asp?issn=0970-9290;year=2018;volume=29;issue=2;spage=190;epage=195;au last=Gupta - ref8](http://www.ijdr.in/article.asp?issn=0970-9290;year=2018;volume=29;issue=2;spage=190;epage=195;au%20last=Gupta-ref8)

However, numerous studies demonstrate that physical assaults have now turned into the most widely recognized reason of maxillofacial fracture in many developed nations, despite the fact that the road accidents remain the well-known reason for injury in many developing areas. Be that as it may, a couple of vast arrangements of patients have been considered in India, and little data is accessible on their relative occurrence and changing patterns in maxillofacial injury over the 15 years.

Materials and Method

All the patients who reported to the Department of Oral and Maxillofacial Surgery, K. M. Shah Dental College, Vadodara, Gujarat and Dhiraj General Hospital, Vadodara, Gujarat between January 2011 to December 2017 were included in the study. We retrospectively reviewed and analyzed the patient records using the hospital database. Age, gender distribution, etiology of injury, fracture pattern was reviewed for this study. The etiological factors were categorized as RTA, fall, assault, sports injury and others.

The fracture pattern was assorted as symphysis, Para symphysis, body, angle, coronoid, condylar fracture in mandible and le fort I, II, III, nasal, naso-orbital ethmoidal, zygomatic arch, zygomatic complex, orbital fracture. Any patient who reported with associated pathology and infections were excluded from the study. The following was then collected and statistically analyzed. Data was processed using SPSS version 17 (SPSS Inc. Released 2008. SPSS Statistics for Windows, Version 17.0. Chicago: SPSS Inc.). The study was designed in accordance with the ethical guidelines of Helsinki. The study was reviewed and approved by Sumandeep Vidyapeeth Institutional Ethics Committee (SVIEC).

Results

A total of 620 patients' data was collected from January 2011 to December 2017 of which 541 were male and 79 were female with the ratio of 6.95:1. (See table 1)

Distribution of the patients were done under 5 groups based on the etiology namely RTA, Fall, Assault, Sports Injury and Others. (See table 2)

Among the different etiological variables responsible for maxillofacial injuries Road Traffic Accidents were found to be the major cause (58.4%)

The data attained was tabulated analysis and quantitative analysis was done for above the parameters. The collective data was analysed with mean, standard deviation, median. To analyze Pearson chi-square test was used. p value ≤ 0.05 is considered to be significant. Data was analyzed using statistical software SPSS (Statistical Package for Social Science. Version 13.0 in Microsoft Excel).

Statistical analysis

Pearson Chi-Square test was used to evaluate the association / significance between the different variables /parameters.

Discussion

The maxillofacial area is the most exposed part of the body and is more susceptible against injury. Injury is one of the significant reasons for death among individuals under 40 years old

This study demonstrated that the maxillofacial fractures pre-predominantly occurred in the age group of 21-30 years (38.9%), trailed by 31-40 years (24.8%) and 41-50 years (15.5%). These discoveries being comparable with the past examinations.^{8,9,10,11,12} The high occurrence in youthful age may be because of the realities that individuals having a place with this decade are increasingly dynamic, enthusiastic, take dynamic cooperation in perilous activities and sports exercises

and for the most part associated with brutality. Men matured 21-40 years speak to a gathering with extraordinary social collaboration and higher rates of dearness, making them progressively vulnerable to transport mishaps and relational violence.¹³

In the age aggregate 0-20 years, rate of the maxillofacial breaks was 10.6% in the present examination. This finding was near some past examinations, one of which demonstrated an occurrence of 9%,¹⁴ and 12% incidence¹⁵ was accounted for in the other. The low rate has been explained by the high versatility of youngsters' bones, the little face in respect to head measure and a diminished presentation to real injury.¹⁶

1.3% incidence was noted in patients of maxillofacial fractures with >60years likely as this age assemble is less dynamic and less engaged with outside exercises. Comparative rate was found by Kadkhodaie MH in Iran¹⁷ and Mahmeed BEA in Kuwait.¹⁸

In men when contrasted with ladies the occurrence of maxillofacial cracks had a proportion of 6.9: 1. This can be clarified by the way that men are progressively associated with outdoor activities and are additionally presented to fierce connections when contrasted with females who are less presented because of social and religious constraints. Male vehicle drivers likewise far outnumber females.¹⁵

According to this study, 58.38% maxillofacial fractures were caused by road traffic accidents followed by falls (23.38%) and assaults (10.6%). Road traffic accidents are the main cause of maxillofacial trauma.^{21, 22, 23}

The reasons for higher frequency of RTA in developing countries are inadequate road safety awareness, unsuitable road conditions without expansion of the motor way network, violation of speed limit, old vehicles without safety features, not wearing seat belts or helmets, violation of high way code and use of al

cohol or other in toxic ting agents
In the present investigation, a large portion of the patients injured in RTA are in age gathering of 21-30 years. These discoveries being comparative with past investigations.^{28, 10} This is because of the reason that individuals of this age aggregate are unpractised drivers; they are well on the way to surpass speed restricts and don't utilize appropriate security measures. Of the all-out number of patients incorporated into the examination, there were 362 patients, who detailed with a background marked by RTA.

Fall from height was the second most common cause of maxillofacial trauma in this study, found in 16.2 % cases. This is similar to the study by Tai seer AlKhateeb8 who reported 20% incidence of maxillofacial injuries? due to fall. Out of the total 119 patients who underwent trauma because of fall from height, 63 were females. Fall from height was the second most common cause of maxillofacial trauma in this study, found in 16.2 % cases. This is similar to the study by Tai seer AlKhateeb8 who reported 20% incidence of maxillofacial injuries? due to fall. Out of the total 119 patients who underwent trauma because of fall from height, 63 were females. Fall from height was the second most basic reason for maxillofacial injury in this examination, found in 23.4 % cases which is comparable to the results by Tai seer Al-Khateeb8 who revealed a 20% rate of maxillofacial injuries because of fall.

Assault related injury was noted in 10.6% of cases in the series with the age range less than 40 years suggesting the involvement of youth in more aggressive activities.

Conclusion

Dissimilar to in most developed nations where assaults have supplanted road traffic accidents as the significant reason for the injuries, in India no evident move from road traffic accidents as the main source of maxillofacial

injuries was noted. Injuries have causes which need to be solved we have to take great supply of the considerable number of instruments available to us, and to get down to what the developed countries have done to lessen street car accidents. In this way, a mindfulness battle to teach the general population about the significance of limitations and defensive safety belts in vehicles and engine cycles ought to be supported. These discoveries should likewise alarm the experts, especially the administration and the Road Safety Commission to the requirement for the arrangement of good streets and traffic direction like traffic lights at intersections, authorization of existing traffic laws in regards to the obligatory utilization of helmets/safety belts and drink-driving enactment, and general improvement of socioeconomic conditions of the population.

References

1. Chandra Shekar BR, Reddy C. A five-year retrospective statistical analysis of maxillofacial injuries in patients admitted and treated at two hospitals of Mysore city. *Indian J Dent Res.* 2008 Oct-Dec;19(4):304-8.
2. Fonseca RL, Walker R, Betts NJ. *Oral and maxillofacial trauma*, 2nd ed. Philadelphia: WB Saunders, 1997.
3. Kapoor P, Kalra N. A retrospective analysis of maxillofacial injuries in patients reporting to a tertiary care hospital in East Delhi. *Int J Crit Illn Inj Sci.* 2012 Jan;2(1):6-10.
4. Mohan D. Transportation Research and Injury Prevention Programme (TRIPP). *Bulletin.*2006; 3(3):1-2.
5. Oji C. Jaw fractures in Enugu, Nigeria, 1985-95. *Br J Oral Maxillofac Surg.* 1999 Apr; 37(2):106-9.
6. Telfer MR, Jones GM, Shepherd JP. Trends in the aetiology of maxillofacial fractures in the United Kingdom (1977-1987). *Br J Oral Maxillofac Surg.* 1991Aug; 29(4): 250-5.
7. Lindahl L. Condylar fractures of the mandible: I. Classification and relation to age, occlusion, and concomitant injuries of teeth and teeth-supporting structures, and fractures of the mandibular body. *Int J Oral Surg.* 1977 Feb; 6(1): 12-21.
8. Bataineh AB. Etiology and incidence of maxillofacial fractures in the north of Jordan. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 1998 Jul;86(1):31-5.
9. Fasola AO, Nyako EA, Obiechina AE, Arotiba JT. Trends in the characteristics of maxillofacial fractures in Nigeria. *J Oral Maxillofac Surg.* 2003 Oct; 61(10):1140-3.
10. Al-Khateeb T, Abdullah FM. Craniomaxillofacial injuries in the United Arab Emirates: a retrospective study. *J Oral Maxillofac Surg.*2007Jun; 65(6): 1094-101.
11. Ola Soji HO, Tahir A, Arotiba GT. Changing pictures of facial fractures in northern Nigeria. *Br J Oral Maxillofac Surg.* 2002 Apr; 40(2): 140-3.
12. Adebayo ET, Ajike OS, Adekeye EO. Analysis of the pattern of maxillofacial fractures in Kaduna, Nigeria. *Br J Oral Maxillofac Surg.* 2003 Dec;41(6):396-400.
13. Brasileiro BF, Passeri LA. Epidemiological analysis of maxillofacial fractures in Brazil: a 5-year prospective study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2006 Jul; 102(1): 28-34.
14. Van Beek GJ, Merckx CA. Changes in the pattern of fractures of the maxillofacial skeleton. *Int J Oral Maxillofac Surg.* 1999 Dec;28(6): 424-8.
15. Al Ahmed HE, Jaber MA, Abu Fanas SH, Karas M. The pattern of maxillofacial fractures in Sharjah, United Arab Emirates: a review of 230 cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2004 Aug; 98(2): 166-70.

16. Adeyemo WL, Iwegbu IO, Bello SA, Ok oturo E, Olaitan AA, Ladeinde AL, et al. Management of mandibular fractures in a developing country: a review of 314 cases from two urban centers in Nigeria. World J Surg. 2008 Dec; 32(12): 2631–5.

17. Kadkhodaie MH. Three-year review of facial fractures at a teaching hospital in northern Iran. Br J Oral Maxillofac Surg. 2006 Jun; 44(3): 229-31.

18. Al Mahmeed BE, Morris RE, Ibrahim M, Belal MS, Al Ramzy A, Al Rassed B, et al. Maxillofacial trauma in Kuwait: a retrospective study (1985-1989). Saudi Denta J.1994; 6:13-6.

19. Salonen EM, Koivikko MP, Koskinen SK. Violence-related facial trauma: analysis of multidetector

computed tomography findings of 727 patients. Dentomaxillofac Radiol. 2010 Feb; 39(2):107-12.

20. Oginni FO, Ugboko VI, Ogundipe O, Adegbehingbe BO. Motorcycle- related maxillofacial injuries among Nigerian intracity road users. J Oral Maxillofac Surg. 2006Jan; 64(1): 56-62.

21. Lida S, Kogo M, Sugiura T, Mima T, Matsuya T. Retrospective analysis of 1502 patients with facial fractures. Int J Oral Maxillofac Surg.2001 Aug;30(4):286-90.

22. Ansari MH. Maxillofacial fractures in Hamedan province, Iran: a retrospective study (1987-2001). J Craniomaxillofac Surg. 2004 Feb; 32(1): 28-34.

Legend Tables

Table 1: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	541	87.3	87.3	87.3
	Female	79	12.7	12.7	100.0
	Total	620	100.0	100.0	

Table 2: Etiology

	Frequency	Percent	Valid Percent	Cumulative Percent
RTA	362	58.4	58.4	58.4
Fall	145	23.4	23.4	81.8
Assault	66	10.6	10.6	92.4
Sports	44	7.1	7.1	99.5
Others	3	.5	.5	100.0
Total	620	100.0	100.0	

Table 3: Gender * Etiology

		Etiology					Total
		RTA	Fall	Assault	Sports	Others	
Gender	Male	323	126	56	34	2	541
	Female	39	19	10	10	1	79
Total		362	145	66	44	3	620

Chi-Square Tests			
	Value	df	P value
Pearson Chi-Square	6.713 ^a	4	.152
Likelihood Ratio	5.823	4	.213
Linear-by-Linear Association	5.932	1	.015
N of Valid Cases	620		

Table 4: Age Group * Etiology

		Etiology					Total
		RTA	Fall	Assault	Sports	Others	
Age Group	10 to 20 Years	26	25	0	12	0	63
	21 to 30 Years	146	52	30	11	2	241
	31 to 40 Years	100	33	14	7	0	154
	41 to 50 Years	59	17	15	5	0	96
	51 to 60 Years	25	14	6	8	1	54
	More than 61 Years	4	2	1	1	0	8
	Less than 10 Years	2	2	0	0	0	4
Total		362	145	66	44	3	620

Chi-Square Tests			
	Value	df	P Value
Pearson Chi-Square	53.224 ^a	24	.001