Print ISSN: 2321-6379
Online ISSN: 2321-595X

Original Article

Changing Trends of Maxillofacial Trauma in Jammu Province in the Past Decade

Roopav Nargotra[1], Amrit Pal Singh[2], Sanjay Kumar Bhagat[2], Satvinder Singh[3]

[1]Associate Professor, Department of Oral and Maxillofacial Surgery, Indira Gandhi Government Dental College, Jammu, Jammu and Kashmir, India, [2]Assistant Professor, Department of Oral and Maxillofacial Surgery, Indira Gandhi Government Dental College, Jammu, Jammu and Kashmir, India, [3]Associate Professor, Department of Oral Medicine and Radiology, Indira Gandhi Government Dental College, Jammu, Jammu and Kashmir, India

Abstract

Introduction: Maxillofacial injuries have been extensively studied, with most statistical analyses being retrospective in nature. The available data on these injuries are highly diverse, reflecting differences across countries, regions, and populations. **Aim:** This study was conducted to evaluate the pattern of maxillofacial fractures in Jammu city over a 10-year period, from January 2014 to February 2024, and to compare the findings with similar studies from Jammu, other parts of India, and globally. **Results:** The peak incidence of maxillofacial fractures was observed in individuals in their second and third decades of life, with a mean age of 28.6 ± 5.3 years. The male-to-female ratio was 1.63:1, indicating a higher prevalence among males. The leading causes of maxillofacial injuries were road traffic accidents (RTAs), accounting for 74.3% of cases, followed by falls (16.6%) and assaults (5.1%). Mandibular fractures were the most common, comprising 58.1% of cases, while midfacial fractures accounted for 30.2%. Open reduction with internal fixation (ORIF) was the most commonly employed treatment modality, while conservative management was used in 20.1% of patients. **Conclusion:** The findings highlight that RTAs continue to be a major cause of maxillofacial trauma in developing countries like India. ORIF remains the preferred treatment approach due to its advantages in terms of early functional recovery, minimal morbidity, and improved nutritional status in patients, compared to closed reduction methods.

Key words: Changing trends, Maxillofacial, Open reduction with internal fixation, Trauma

INTRODUCTION

Jammu, located in the southern region of the Indian Union Territory of Jammu and Kashmir, is popularly known as the "City of Temples" due to the abundance of temples throughout the area. Maxillofacial injuries have been extensively studied, with most statistical analyses being retrospective in nature (Bakardjiev and Pechalova, 2007). The available data on these injuries are highly diverse, reflecting differences across countries, regions, and populations. In developing countries, road traffic accidents (RTAs) remain the most common cause of facial trauma (Bormann *et al.*, 2009). Facial trauma involves damage to the bones or soft tissues of the face and may result from motor vehicle accidents, assaults (including gunshot wounds), sports injuries, falls, chemical exposures, thermal burns, or animal bites.[3-6] Given the exposed nature of the face and its importance in identity and communication, facial fractures are a major source of morbidity. According to a global study, there was a 39.4% increase in facial fracture cases between 1990 and 2017, with India reporting the highest number (1,127,438.84 cases). Males were affected nearly twice as often as females. These injuries can present in isolation or be part of complex trauma involving the head, chest, abdomen, spine, limbs, and often psychological distress. Numerous studies have been conducted worldwide to identify patterns in facial fractures, including those from England, Finland, Italy, Japan, Nigeria, New Zealand, Poland, Pakistan, Bulgaria, and the United States.[7-9] Indian studies from various states consistently report RTAs as the leading cause. Regional data collection is essential for improving management protocols and implementing targeted prevention strategies. To the best

Access this article online

www.ijss-sn.com

Month of Submission : 08-2025
Month of Peer Review : 09-2025
Month of Acceptance : 10-2025
Month of Publishing : 10-2025

Corresponding Author: Dr. Roopav Nargotra, Department of Oral and Maxillofacial Surgery, Indira Gandhi Government Dental College, Jammu, Jammu and Kashmir, India.

of our knowledge, no study to date has investigated the changing patterns of maxillofacial fractures specifically in the Jammu region. The aim of this study is to analyze the pattern of maxillofacial fractures in Jammu over a 10-year period and compare the findings with similar studies from India and other parts of the world.

MATERIALS AND METHODS

Patients, who reported to the emergency room with referrals to the Department of Oral and Maxillofacial Surgery, Indira Gandhi Government Dental College, Jammu, were evaluated. Though the study is an evaluative study which does not involve inputs from patients or disclosure of identity or records, the institutional ethical clearance was still obtained. Inclusion criteria included patients who reported to the institute between January 1, 2014, and December 31, 2024, for management of maxillofacial fractures. Exclusion criteria included patients with soft tissue injuries only, cases with a neurosurgical component who were referred from the emergency department, patients who refused treatment, patients who died before treatment, and those who did not report for follow-up after treatment. The diagnosis was made clinically and confirmed radiographically. Data about age, gender, month and year of diagnosis, etiology, diagnostic modality, site of the fracture, and mode of treatment with the type of anesthesia were recorded from the inpatient department case sheet. Data analyzed using software Statistical Package for the Social Sciences (SPSS) version 20 (SPSS, Chicago, IL, USA). Qualitative variables will be expressed as frequencies and percentages and quantitative variables will be expressed as mean and standard deviation. The Chi-square test was applied to find the association between categorical variables. The level of significance was set at 0.05.

RESULTS

A total of 9895 patients with maxillofacial fractures were studied. In the present study, the age distribution of the patients ranged from 2 to 81 years with a mean age of 28.6 years. Among these, 5211 cases (52.7%) were in the second and third decades of life. About 61.9% of males and 38.1% of females constituted the study population [Table 1]. On the evaluation of the month and year of diagnosis, the number of maxillofacial fractures ranged between 324 and 1212 cases annually with a mean of 989.5 cases/year. The maximum number of cases was noted in the year 2023 and the least were reported in 2020 as per this study data [Table 2] Based on the etiology of injury, the most common cause for maxillofacial fractures in this study was due to RTAs (74.3%), falls (16.6%) followed by 507 cases (5.1%) due to assaults [Table 1]. The patients were evaluated clinically and radiographically to arrive at the final diagnosis. An orthopantomogram, head-and-neck computed tomography with threedimensional reconstruction was done as and when required. The highest number of maxillofacial cases presented in this study were mandibular fractures, accounting for 5743 cases (58.1%). The study comprised 2988 cases (30.2%) of midface and zygomaticomaxillary complex (ZMC) fractures and 684 cases (6.8%) of orbital fractures. Pan facial trauma was noted in 480 cases (4.9%) [Tables 2 and 3]. Among the 9895 cases, 6036 cases (61%) underwent open reduction with internal fixation, 1444 cases (18.3%) underwent closed reduction, and the remaining 2046 (20.7%) were managed conservatively [Table 4].

Table 1: Cause of injury

Etiology	Sex		Total (%)
	Male	Female	
Road traffic accident	4715	2642	7357 (74.3)
Domestic violence	27	249	276 (2.8)
Fall	914	732	1646 (16.6)
Assault	381	126	507 (5.1)
Sports related	25	9	34 (0.03)
Gunshot/missile injury	37	0	37 (0.04)
Animal attack	34	4	38 (0.04)
Total (%)	6133 (61.9)	3762 (38.1)	9895 (100)

DISCUSSION

Maxillofacial injuries vary between and within countries and depend on socioeconomic status, traffic standards, and topography of that area. The geographical area, population density, socioeconomic status, culture, and regional government era of the time and type of facility where the study was conducted will all influence the epidemiologic survey.[1,2] The etiology of facial injuries has shifted over recent decades. In developed nations, assaults and falls are now the leading causes of facial trauma.[1] In contrast, RTAs continue to dominate as the primary cause in much of Asia and Africa. The findings of the present study align with the latter, with RTAs accounting for 74.3% of all maxillofacial fractures, followed by falls (16.6%) and assaults (5.1%). This study observed the highest incidence of injuries among individuals in the second and third decades of life, consistent with International studies, which report peak incidences between the second and fourth decades.[2] In Regional Indian studies from Gujarat, Haryana, and Delhi, 21–30 age group is most affected. The male-to-female ratio in this study was 1.63:1, supporting the trend of male predominance in facial trauma cases in India.[10-13] This pattern is culturally and socioeconomically influenced. By contrast, developed countries report a higher male-to-female ratio (2.1:1) due to greater female participation

Table 2: Year of diagnosis

Year	Mandible (%)	Maxilla/Zygomaticomaxillary complex (%)	Orbit (%)	Panfacial (%)	Total (%)
2014	771 (78.2)	169 (17.1)	17 (1.7)	29 (2.9)	986 (9.9)
2015	647 (77.2)	136 (16.2%)	26 (3.1)	29 (3.5)	838 (8.5)
2016	689 (72.1)	189 (19.8)	44 (4.6)	33 (3.5)	955 (9.7)
2017	453 (53.6)	280 (33.1)	78 (9.2)	34 (4.0%)	845 (8.5)
2018	567 (57.2)	315 (31.7%)	67 (6.8)	43 (4.6)	992 (10.0)
2019	345 (41.3)	345 (41.3)	98 (22.5)	48 (5.7)	836 (8.4)
2020	150 (46.3)	141 (43.5)	13 (4.0)	20 (6.0)	324 (3.3)
2021	444 (57.7)	230 (29.9)	56 (7.3)	39 (5.1)	769 (7.8)
2022	678 (65.5)	246 (23.8)	69 (6.7)	42 (4.1)	1035 (10.5)
2023	564 (46.5)	466 (38.4)	107 (8.8)	75 (6.2)	1212 (12.2)
2024	435 (39.4)	471 (42.7)	109 (9.9)	88 (7.9)	1103 (11.1)
Total	5743 (58.1)	2988 (30.2)	684 (6.8)	480 (4.9)	9895 (100)

Table 3: Relation between demography and type of injury

Age (years)	Type of injury								Total (%)
	Mandible		Maxilla/Zygomaticomaxillary complex		Orbit		Panfacial		
	Male	Female	Male	Female	Male	Female	Male	Female	
0–10	47	40	38	38	9	8	10	8	198 (2)
11–20	397	196	369	190	70	86	58	35	1401 (14.2)
21–30	910	768	533	266	87	96	56	39	2755 (27.8)
31–40	896	580	587	146	78	49	107	13	2456 (24.8)
41–50	606	421	146	110	47	36	36	26	1428 (14.4)
51–60	341	236	247	111	34	21	23	16	1029 (10.4)
>61	207	98	133	74	37	26	24	29	628 (6.3)
Total	3404	2339	2053	935	362	322	314	166	
	5743		2988		684		480		9895
	9895								

Table 4: Treatment modality

Treatment given	Mandible	Maxilla/ Zygomaticomaxillary complex	Orbit	Panfacial	Total (%)
Closed reduction	1444	253	0	116	1813 (18.3)
Open reduction and fixation	3621	1871	288	256	6036 (61.0)
Conservative management	678	864	396	108	2046 (20.7)
Total	5743	2988	684	480	9895 (100)

in professional and outdoor activities, increasing their exposure to accidents and violence.[3]

An average of 989.5 cases/year was recorded, with the highest incidence in 2023 and lowest in 2020. The sharp decline in 2020 is likely due to COVID-19 lockdowns, which restricted public mobility. The resurgence in 2022–2023 may correlate with increased return to in-person work and surge in road traffic and vehicular movement.[4] Despite the already high national average, this study recorded a notably higher incidence of RTAs (74.3%), which may be due to poor road conditions (slippery, muddy terrain), vehicle issues (overloading, lack of maintenance, brake/steering failures), lack of traffic law enforcement, especially regarding helmet use on two-wheelers, involved in 31% of RTA-related injuries and alcohol influence, especially in developing regions.[5]

The most common injury remained mandibular fractures (58.1%), followed by midface/ZMC fractures (30.2%). However, there is a notable decade-long trend: Mandibular fractures declined from 77.1% to 39.4% and midface fractures increased from 17.1% to 42.7%.[14] This shift may reflect changes in impact dynamics (e.g., frontal impacts from RTAs), better helmet usage, or even variations in diagnostic tools and clinical awareness.

CONCLUSION

In India, RTAs continue to be one of the leading causes of maxillofacial fractures. However, it is crucial to recognize and evaluate region-specific etiological factors to inform more effective prevention and treatment strategies. Our study highlights that in the region of Jammu, RTAs

remain the predominant cause of facial injuries. Given the unique topographical and infrastructural challenges of this area, these findings underscore the importance of integrating regional data into broader national urbanization programs. There is an urgent need to enforce stricter traffic regulations, including mandatory helmet use for two-wheeler riders, seat belt enforcement for four-wheelers, and strict monitoring of speed limits and vehicle overloading. From a clinical perspective, open reduction and internal fixation continues to be the preferred modality of treatment due to its ability to achieve accurate fracture reduction, restore function early, enhance oral health-related quality of life, minimize masticatory disability, and promote better nutritional outcomes by avoiding prolonged jaw immobilization, as seen with closed reduction. The variability in patient sources and findings across different regions of India suggests a need for further area-specific studies. A more detailed pan-India epidemiological analysis is warranted to track and understand the evolving patterns in maxillofacial trauma and tailor public health interventions accordingly.

REFERENCES

1. Bakardjiev A, Pechalova P. Maxillofacial fractures in southern Bulgaria-A retrospective study of 1706 cases. J Craniomaxillofac Surg 2007;35:147-50.
2. Bormann KH, Wild S, Gellrich NC, Kokemuller H, Stuhmer C, Schmelzeisen R, *et al*. Five-year retrospective study of mandibular fractures in Freiburg, Germany: Incidence, etiology, treatment, and complications. J Oral Maxillofac Surg 2009;67:1251-5.
3. Nikunj A, Ingole SN, Kazi NN, Kujur S, Deshpande MD, Ranadive PA. A changing trend in pattern of maxillofacial trauma in Mumbai: A prospective study. Indian J Dent Res 2023;34:387-90.
4. Chandra L, Deepa D, Atri M, Pandey SM, Passi D, Goyal J, *et al*. A retrospective cross-sectional study of maxillofacial trauma in Delhi-NCR region. J Family Med Prim Care 2019;8:1453-9.
5. Abhinav RP, Selvarasu K, Maheswari GU, Taltia AA. The patterns and etiology of maxillofacial trauma in South India. Ann Maxillofac Surg 2019;9:114-7.
6. Weihsin H, Thadani S, Agrawal M, Tailor S, Sood R, Langalia A, *et al*. Causes and incidence of maxillofacial injuries in India: 12-year retrospective study of 4437 patients in a tertiary hospital in Gujarat. Br J Oral Maxillofac Surg 2014;52:693-6.
7. El Shehaby DM, Farahat AM, Shahine MS, Mohammed HM. Medico-legal evaluation and trend of the different patterns of maxillofacial fractures concomitant with closed head injury in upper Egypt: Retrospective study. Egypt J Forensic Sci 2020;10:1-9.
8. Asiri A, Algoblan D, Asiri E, Albishi S, Al Salamah M. Trends of maxillofacial and mandibular fractures in level I and II trauma patients in a tertiary Hospital in Saudi Arabia. Saudi Dent J 2022;34:772-8.
9. Werlinger F, Villalón M, Duarte V, Acevedo R, Aguilera R, Alcocer D, *et al*. Trends of maxillofacial trauma: An update from the prospective register of a multicenter study in emergency services of Chile. Med Oral Patol Oral Cir Bucal 2019;24:e588-94.
10. Diab J, Moore MH. Patterns and characteristics of maxillofacial fractures in women. Oral Maxillofac Surg 2023;27:459-68.
11. Ogunbowale A, Costello L, McCormack D, Ekanayake K, Kearns GJ. Maxillofacial fractures in females: A 5-year retrospective review. Ir J Med Sci 2022;191:367-74.
12. Kumar S. Forecasting road accident deaths in India using SARIMA. J Predict Mark 2024;18:85-96.
13. Shome D, Surana M, Male SR, Kumar V, Vyavahare SS, Abrol A, *et al*. Patterns and trends of facial fractures at a tertiary care trauma center in India-A 13 years retrospective study. Craniomaxillofac Trauma Reconstr 2023;16:112-20.
14. Hurkat A, Pendem S, Selvarasu K, Krishnan M. Changing trends in central midface fracture-A proposal for revised classification and holistic management. J Oral Maxillofac Surg Med Pathol 2024;36:171-7.

How to cite this article: Nargotra R, Singh AP, Bhagat SK, Singh S. Changing Trends of Maxillofacial Trauma in Jammu Province in the Past Decade. Int J Sci Stud 2025;13(7):10-13.

Source of Support: Nil, **Conflicts of Interest:** None declared.