Journal of Contemporary Issues in Business and Government Vol. 27, No. 2, 2021
https://cibg.org.au/

P-ISSN: 2204-1990; E-ISSN: 1323-6903
DOI: 10.47750/cibg.2021.27.02.080

Incidence of Maxillofacial Injury Among Patients Reporting to Private Dental College: A Retrospective Study

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Abstract: Maxillofacial injury often results in mortality and morbidity related to functional and esthetic compromise. In developing countries, the greatest threat to sustaining these injuries is in road traffic accidents. It is estimated that 1.3 lakh people end up in fatal death each year due to RTA. The aim of the study is to analyse the age and gender distribution of maxillofacial injuries and to find any association between the etiology of injury with age and gender. This retrospective observational study was conducted among patients reporting to the Department of oral and maxillofacial surgery in Saveetha Dental College, Chennai. Exclusion criteria was patients reporting fractures associated/ secondary to other pathologies (local or systemic), patients with debilitating systemic disease, mentally and physically challenged, patients with head or cervical spine injury. The study data were retrieved from DIAS and analysed in IBM SPSS using descriptive statistics. Among 77 samples included in the study, 85.7% were males and 14.3% were females. Maxillofacial injury was more commonly seen in the 3rd decade of life (35.1%). There was no significant association between etiology and gender and etiology and age. Maxillofacial injury is more prevalent in males in their 3rd decade of life.

Keywords: epidemiology, incidence, innovation, maxillofacial injury, maxillofacial trauma, road traffic accidents

INTRODUCTION

Mortality and morbidity due to injuries continues to be a burden in the developing countries(S. Alex Rottgers and Joseph Edward Losee, 2018). The World Health Organisation (WHO) in 2013 estimated that 93% of accidents on road occurred in low and middle income countries, even though these countries only have 63% of the world's vehicles with road traffic accidents being the major cause of death in children and young adults aged 5-29 years. Every year 1.3 million people die worldwide due to RTA(Oecd and OECD, 2015).

The complexity of maxillofacial skeleton and its proximity to the skull base and spinal cord, make injuries to these regions a critical one(Christabel et al., 2016; Marimuthu et al., 2018; Schaftenaar et al., 2010) . Injuries sustained by maxillofacial skeleton result in severe morbidity compromising function and aesthetics and if concomitant with head or cervical column injury can even result in mortality(Abosadegh et al., 2019a; Vijayakumar Jain et al., 2019). The distribution of maxillofacial injury is determined by various factors, including the demography, socio-economic status, geographic variations, cultural and environmental factors. These factors result in a change in trend or pattern in different populations and these deviations are of importance in understanding, standardizing and modifying the health care concerns of these populations(Gassner et al., 2003a; Jesudasan et al., 2015; Kumar and Rahman, 2017; Rahman and Santhoshkumar, 2017; Torgersen and Tornes, 1992a). In the developing nations, the major cause of maxillofacial injuries in road traffic accidents followed by assault(Ahmed et al., 2004; Almasri, 2013). Prevalence of these injuries is more in male population in their 3rd or 4th decade of life(Abhinav et al., 2019; Adhikari et al., 2012; Al-Hassani et al., 2019a; Bamjee et al., 1996a; Packiri et al., 2017).

Our department is passionate about research we have published numerous high quality articles in this domain over the past years ((Kavitha et al., 2014) , (Praveen et al., 2001),(Devi and Gnanavel, 2014), (Putchala et al., 2013), (Vijayakumar et al., 2010), (Lekha et al., 2014a, 2014b) (Danda, 2010) (Danda, 2010) (Parthasarathy et al., 2016) (Gopalakannan et al., 2012), (Rajendran et al., 2019), (Govindaraju et al., 2017), (P. Neelakantan et al., 2015), (PradeepKumar et al., 2016), (Sajan et al., 2011), (Lekha et al., 2014a), (Neelakantan et al., 2013),

(Patil et al., 2017), (Jeevanandan and Govindaraju, 2018), (Abdul Wahab et al., 2017), (Eapen et al., 2017), (Menon et al., 2018), (Wahab et al., 2018), (Vishnu Prasad et al., 2018), (Uthrakumar et al., 2010), (Ashok et al., 2017), (Prasanna Neelakantan et al., 2015). In this study our aim was to understand the epidemiology and etiology of maxillofacial injuries among patients reporting to a dental college in South India.

METHODOLOGY

The retrospective observational study was conducted among patients reporting to the Department of Oral and Maxillofacial surgery at Saveetha Dental College and hospital, Chennai during the time period June 2019 to March 2020.

Inclusion criteria

1. Patients reporting to the department of oral and maxillofacial surgery with maxillofacial injury.
2. Patients of any age group and Gender.

Exclusion criteria

1. Maxillofacial injury associated or secondary to other maxillofacial pathologies eg: pathological fracture secondary to systemic diseases or local factors such cystic or tumor.
2. Patients with cervical or head injury.
3. Patients with history of debilitating systemic diseases
4. Patients who are physically or mentally challenged.

Ethical Consideration

Approval was obtained from the Institutional Review Board of Saveetha Institute of Medical and Technical Sciences, India.

Data Collection

The patient demographic details and data pertaining to study parameters were retrieved from patient records provided by the institution. A total of 97 patients had reported to the department of oral and maxillofacial surgery with maxillofacial injury during the study period of which only 77 of them fulfilled the inclusion criteria and were included in the study.

Study Parameters

From DIAS, the following data were extracted for the purpose of the study:

1. Demographic data (age, gender)
2. Etiology of injury
3. Types of injury (soft tissue, hard tissue or both)
4. Types and site of fracture (if any)
6. Site of soft tissue injury (intra-oral, extra oral or both)

Statistical Analysis

The data obtained was subsequently tabulated in excel spreadsheet and was exported to IBM SPSS version 20 for statistical analysis. The data were analysed descriptively measuring mean, standard deviation, percentage and frequency. The association between different study parameters were analysed using Pearson's Chi square test at confidence interval 95%. The output was generated with graphical and tabular representatives.

RESULTS AND DISCUSSION

Among the 77 samples included, maxillofacial injury was seen to be more prevalent in the 3rd decade of life (35.1%) followed by the 4th decade (27.3%) as seen in this study with mean age of (Fig 1) (Table 1).In the study, 85.7% were males and 14.3% were females (Fig 2).The most common cause of injury trauma was road traffic accidents (57.1%) followed by assault (19.5%) with least common being extraction of teeth (1.3%) (Fig 3). Most common fracture in the maxillofacial region was found to be dentoalveolar in nature (22.7%) closely followed by angle fracture (21.6%)(Fig 4). The least common sites for fracture were isolated nasal bone and Zygomatic arch fractures (1.1%)(Fig 4). Zygomatic complex fracture is 3rd most common occurring in 14.8% of individuals (Fig 4). Among the mandibular fractures, the most common sites were angle (33.3%) followed by Parasymphysis (24.6%)(Fig 5). 57.9% patients reported with only extra oral soft tissue injury while 21.1% reported with intraoral soft tissue injury and both(Fig 6). The association between age and etiology of injury was found to be statistically significant with p value 0.05 at CI 95% (Fig 7) while association between gender and etiology of injury was found to be non-significant with p value: 0.7 (> 0.05) at CI-95% in the study population (Fig 8).

Maxillofacial injury is not only an individual but also a societal hazard and poses a burden due to its risk of mortality and severe morbidity including facial disfigurement and functional disturbance(Abosadegh et al., 2019a). The distribution of these injuries differs between various populations(Kieser et al., 2002; Motamedi et al., 2014; Mp, 2017a; Sweta et al., 2019). According to the National Health Portal of India, 1.3lakh people sustain fatal traumatic injuries due to road traffic accidents each year placing India in the top of the list for global fatalities from RTA. This can be attributed to the rapid shift towards urbanization combined with lack of appropriate road engineering, poor awareness levels, non-existent injury prevention program and poor enforcement of traffic laws(Patturaja and Pradeep, 2016; Ruikar, 2013).The demographic distribution of our study was consistent with previous literature where maxillofacial injuries were prevalent most commonly in men in their 3rd decade of life(Al-Hassani et al., 2019b; Chandra et al., 2019; Rao and Santhosh Kumar, 2018). The majority of the patients in our study population were males (85.7%) with a mean age of 30.1 years ranging between 4 years to 67 years.

The most common cause of injury in our study population was RTA (57.1%) followed by assault (19.5%) and fall (15.6%). This finding is consistent with other reports from developing countries and confirms the continuing trend in the urbanizing societies of these countries(Almasri, 2013; Bamjee et al., 1996b; Gassner et al., 2003b; Patil et al., 2017; Torgersen and Tornes, 1992b).

The most common site of fracture was dentoalveolar in nature (22.7%) closely followed by angle fracture (21.6%). The occurrence of mandibular fractures was seen to be more compared to fractures of upper and midfacial skeleton. These findings are consistent with reports by Mwaniki et al (1990), Perkin et al (1988) and Adhikari et al (2012)(Adhikari et al., 2012; Al-Hassani et al., 2019b);(Chandra et al., 2019; Mwaniki and Guthua, 1990) Conversely, studies conducted by Abosadegh et al in Malaysian population and Al-Hassani et al in middle eastern population reported orbital and maxillary fractures as the most prevalent ones in the respective population(Abosadegh et al., 2019b; Al-Hassani et al., 2019c; Kumar and Sneha, 2016; Mp, 2017b).

Association between age and etiology of injury yielded a statistically significant result with p value 0.05 at CI 95%. This is in line with modern literature.

Interestingly, there was found to be no association between age and gender to the etiology of injury (P> 0.05 at CI 95%). This in contrast to previous reports and may be due to the smaller size and urbanized nature of the study population.

No research is exempt from limitation and ours falls short in that the sample size is restricted due to the narrow duration of study, the risk factors of RTA such as alcohol abuse, mobile usage etc. were not evaluated. Complication rate, and pattern of injury were also not studied.

CONCLUSION

Within the limits of our study, we found 20-30year old males have a higher chance of sustaining maxillofacial injury especially in RTA. Dentoalveolar and angle fractures were more. We found a statistically significant association age and etiology of injury while the association between gender and etiology of injury of the population under study was not found to be statistically significant.

ACKNOWLEDGEMENT

This study was supported by Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai.

Conflict of Interest

The authors state no conflict of interest

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Table 1. Descriptive statistics of age of the study population where mean age is 31.15 years with the minimum age being 4 years and maximum age being 67 years.

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	77	4.00	67.00	31.1558	12.44574

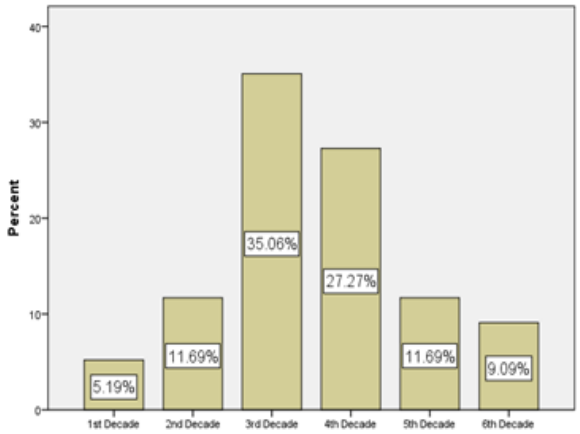

Fig.1: Simple bar showing distribution of age with X axis denoting the age in decades and Y axis denoting the percentage of the study population; Maxillofacial injury was sustained the highest in the 3rd decade (35.06%) of life followed by the 4th decade (27.27%). It was least common in the 1st decade of life (5.19%).

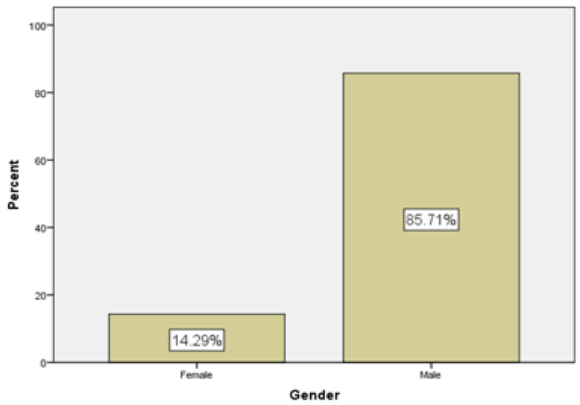

Fig.2: Simple bar showing distribution of gender; X axis represents gender and Y axis represents the percentage of the study population; Maxillofacial injury was more common in males (85.71 %) compared to females (14.29%)

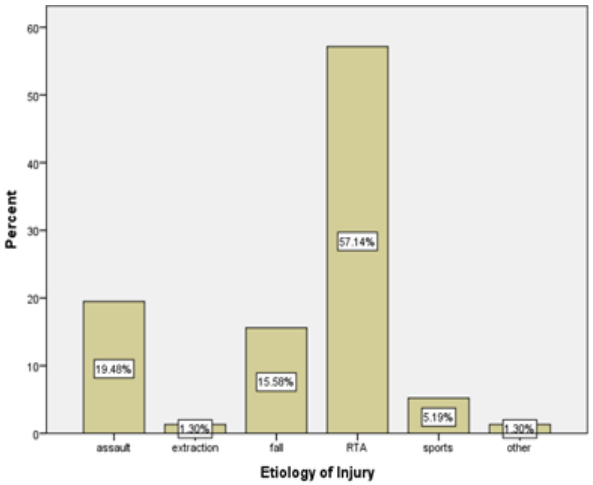

Fig.3: Simple bar showing distribution of etiological factors of injury with X axis denoting the etiology of injury and Y axis denoting the percentage of the incidences; RTA (57.14%) was the most common cause of injury followed by assault (19.48%) and fall (15.58%).

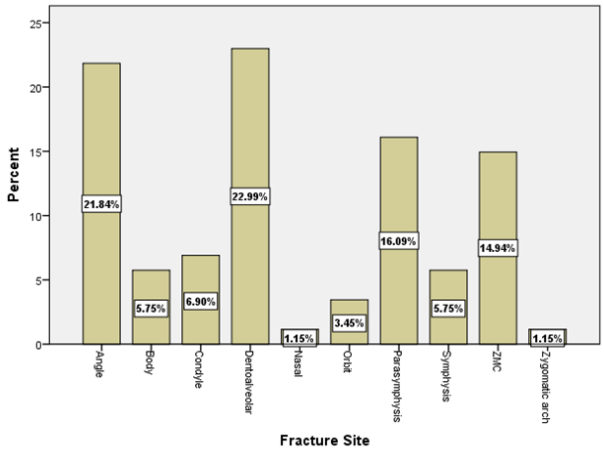

Fig.4: Simple bar showing distribution of the site of fracture where X axis represents the site and Y axis represents the percentage; Dentoalevolar (22..99%) was the commonly affected site followed by angle (21.84%) while nasal bone (1.15%) and zygomatic arch (1.15%) were least affected.

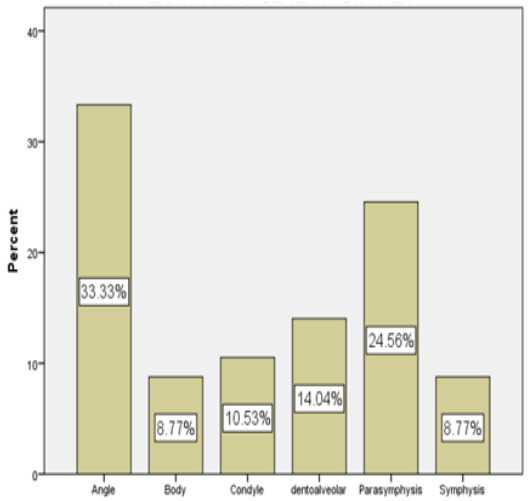

Fig.5: Simple bar showing distribution of the site of mandibular fracture where X axis represents the site and Y axis represents the percentage; Mandibular angle (33.33%) was the commonly affected site followed by parasymphysis (24.56%) while mandibular body (8.77%) and symphysis (8.77%) were least affected.

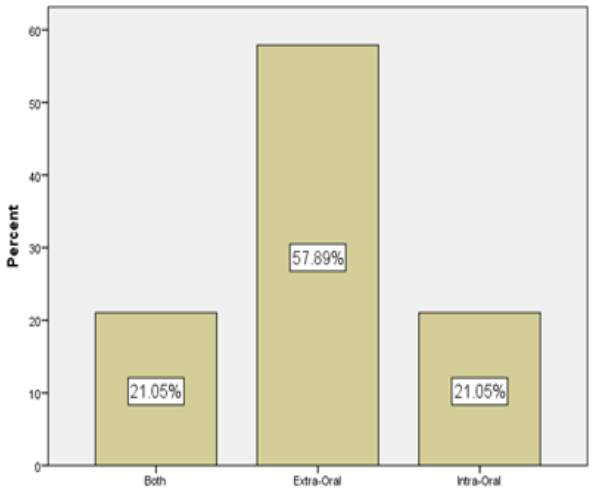

Fig.6: Simple bar showing distribution of soft tissue injury where X axis denotes the site of soft tissue injury and Y axis denotes the percentage; Majority of soft tissue injury sustained was extra oral (57.89%) in nature.

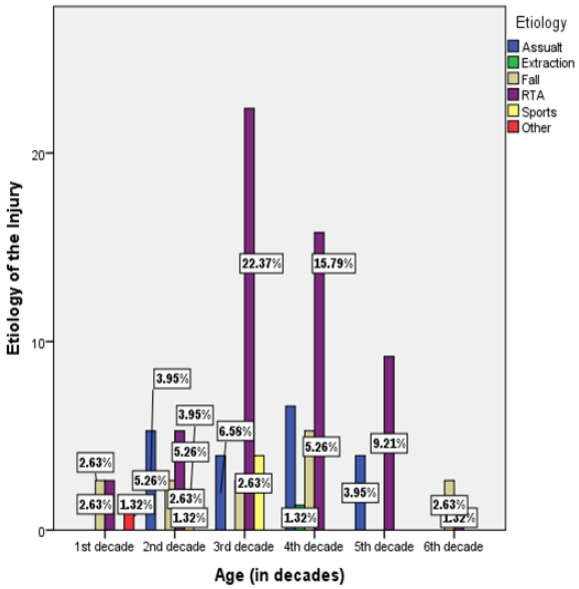

Fig.7: Grouped bar showing association between age and etiology of injury where X axis denotes the age in decades and Y axis denotes the etiology of injury represented in percentage; Maxillofacial injury was most common in 3rd decade of life with RTA being the most common cause of injury (22.37%,); Chi square test was done and association was found to be statistically significant with p value: 0.05 at CI 95%

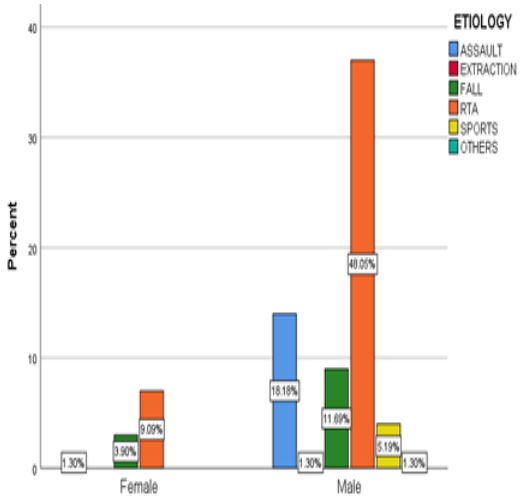

Fig.8: Grouped bar showing association between gender and etiology of injury where X axis denotes the gender and Y axis denotes the etiology of injury represented in percentage; Maxillofacial injury was most common in males with RTA being the most common cause of injury (48.05%); Chi square test was done and association was found to be not statistically significant with p value: 0.7 (> 0.05) at CI 95%