Original Research Article

Retrospective analysis of the effect of alcohol abuse and restraining device on maxillofacial injury in a tertiary care hospital

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Abstract

Introduction: Gaucher's disease is a hereditary disease that can be diagnosed by determination of acid β glucosidase enzyme activity on leucocytes but it's diagnosis is mostly delayed due to limited availability of test.To determine prevalence of Gaucher's disease in patients of unexplained splenomegaly and/or thrombocytopenia using dried blood spot filter test.**Methodology:** This prospective cross sectional study was conducted after approval from Institutional ethical committee in 222 subjects, assuming 3.6% prevalence of the disease among unexplained cases of splenomegaly with 95% confidence interval, 0.05 α error, 80% power and with an absolute allowable error of 2.5%. After implementation of the diagnostic algorithm, samples from the patients were collected on dried blood pot filter paper and sent for analysis. Patients who tested positive by screening test were confirmed through mutational analysis done from the same sample. Data was expressed as mean, proportions and percentages. Mann Whitney test,Chi square test and Fisher's exact test were used for analysis.**Results:**The prevalence of Gaucher's disease in our study population was 2.7% (CI 0.54 to 4.86) with the odds ratio for gender calculated as 3(95% CI 0.344 to 26.134).**Conclusion:**The results of this study show that the use of an appropriate diagnostic algorithm and DBS filter test facilitate early diagnosis and management of a rare disease, thereby saving a lot of medical resources while simultaneously improving the quality of life in patients.

Keywords: Maxillofacial injuries, OPD, CT, general anaesthesia.

Introduction

Maxillofacial injuries range from isolated injuries involving only one or two components of the facial skeleton to complex facial injuries involving the entire facial skeleton. The magnitude and aetiology of oral and maxillofacial injuries varies from one geographic region to another or even within the same region depending on the prevailing socioeconomic, cultural and environmental factors. Maxillofacial injuries can cause long-term functional, aesthetic, and psychological complication. Also these injuries may lead to substantial economic consequence on the patients[1-3].The main causes of maxillofacial injuries are road traffic accidents (RTAs), assaults, falls, sports-related injuries and wars. Road traffic accidents (RTA) are the major cause of maxillofacial injuries in the developing countries like India. However usage of restraint devices significantly reduces the risk and severity of injury, and also reduces the number of deaths resulting from crashes. Trauma is often related to the use of alcohol and its abuse has reached massive proportions, no matter if the country is developed or not, it is being considered as public health problem[4-7] Furthermore, alcohol has a strong association with facial injuries due to interpersonal violence and motor vehicle accidents. Analysis of the causes and types of facial bone fractures provides some important guidelines for the prevention and treatment of fractures in the future[8,9]Therefore, there have been multiple studies on this issue.

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With this background the present study was conducted in our centre which is closely located near national highway road where many RTA cases are treated. This study evaluated the pattern, aetiology, management of maxillofacial injuries, association of alcohol abuse and assessed the various factors like restraint/protective devices influencing their distribution. Such epidemiological data helps in planning of the future public health programs directed at prevention of accidents.

Materials and methods

The study was conducted at the department of dentistry, Santhiram Medical College and Hospital, Nandyal. The data was obtained from the case record sheets of 225 patients who reported to the dental OPD and casualty during the period from January 2018 to November 2020.

Study design

Retrospective study was conducted after institution ethical committee approval. A proforma was prepared for the collection of data from case records such as patients age, sex, aetiology, history of alcohol intake, type of injury which included soft tissue injury and fracture, radiographs (OPG and CT scans), use of protective device at the time of injury and treatment rendered (Closed reduction, open reduction and internal fixation for maxillofacial fractures, soft tissue repair for lacerations, contusions and abrasions under local or general anaesthesia).

Inclusion Criteria

The patients of either gender between aged between 5-75 years, with isolated maxillofacial injuries were included in the study.

Exclusion Criteria

Unconscious patients, head injury patients, poly trauma patients and pregnant females were excluded from the study.

The aetiology of injury was categorized into five main categories: Road traffic accident (RTA) involving automobiles, motorcycle which included drivers, pillion riders, passengers, and pedestrians, (b) Self fall, (c) Assaults or interpersonal violence, (d) Work related injury, (e) Sports injuries. Fractures were assessed according to location that is exclusively lower third, middle third and combination of both middle third and lower third of the face. Sites of mandibular fractures were classified as symphysis, parasymphysis, body, angle, ramus, condyle, coronoid and dentoalveolar. Sites of mid-facial fractures were classified as maxilla, zygoma, naso-orbito-ethmoid, isolated zygomatic arch, orbital floor, nasal. The maxillary fractures were classified according to Lefort classification[10]

Vehicles were divided into two categories, category A: two-wheel vehicle (e.g. motorcycle) and category B: four-wheel vehicle (light motor vehicle and heavy motor vehicle).

Statistical Analysis

The data was entered into MS Office Excel 2016 and subjected to statistical analysis using Instat Graph Pad. The data obtained were statistically analysed and following content analysis the data were interpreted using percentage.

Results

During the study period, a total of 225 patients were included and a total of 288 maxillo-facial fractures were analysed**.**

Demographic Pattern

The male: female ratio was 3:1. Males outnumbered females. Gender wise Distribution of the Maxillofacial injuries is shown in Fig 1. The patient age ranged from 5 to 75 years; most affected age group was from 21-30 year (49.3%) followed by patients in the age group between 31-40 year (24%). Age wise distribution of the injury is shown in Fig 2.

Mechanism/Aetiology of Maxillofacial Injury

The most frequent aetiology of maxillofacial injury was road traffic accident [RTA] accounting for 65.3% of patients followed by self-fall (16%). The mechanism/aetiology of maxillofacial injury is shown in Fig 3.

Type of Vehicle Used/Association of Alcohol Consumption

74% of male patients (108/147) were under the influence of alcohol at the time of injury. Among the RTA motorized two-wheeler accidents accounted in 129 patients (87.7%).The accidents included skids and falls, collision with other vehicles and pedestrians. The type of vehicle and alcohol intoxication in Road Traffic Accident is shown in Fig 4.

Analysis of Type of Fracture/Injury and Anatomical Site

The anatomical site of maxillofacial fracture/injury is shown in Fig 5. Analysis shows that mandibular fractures were common and accounted for 32.26% of fractures (93/288). Maxillary fracture was seen in 15 patients (5.2%), and nasal bone fractures in 12 patients (4.16%), zygomatico maxillary complex fractures accounted for 26.04%(75/288), 20.8% (60/288) caused isolated soft tissue injury of the face, 11.4% were dento-alveolar fractures (33/288). Fig 6 shows that among the mandibular fractures, symphysis and parasymphysis fracture were the most common fracture sites in 51 cases (17.7%).

Analysis of Treatment and Type of Anaesthesia

38.6% of patients (87/225) were treated by closed reduction and arch bar fixation under local anaesthesia, 34.7% of patients (78/225) were treated with open reduction and internal fixation (ORIF) under general anaesthesia, Isolated Soft tissue injuries requiring tissue repair and dressing under local anaesthesia were performed in 26.7%(60/225) patients which were mostly located extra orally and included contusion, lacerations and abrasions. shows the treatment rendered (closed reduction/ open reduction and internal fixation) and type of anaesthesia given (local anaesthesia/ general anaesthesia).

Analysis of Restraint Device Used at the Time of Injury

The Use/non-use of restraint devices and severity of maxillofacial injuries are shown in Fig 7. There were 129 patients (87.8%) in category A vehicles and 18 patients (12.2%) in category B vehicles. Among 129 patients in category A, 120 patients (93.02%) were not wearing the helmet while 9 patients (6.97%) were wearing the helmet during the RTA. In category B, 12 patients (66.7%) were wearing the seat belt whereas 6 patients (33.3%) were not wearing the seat belt.

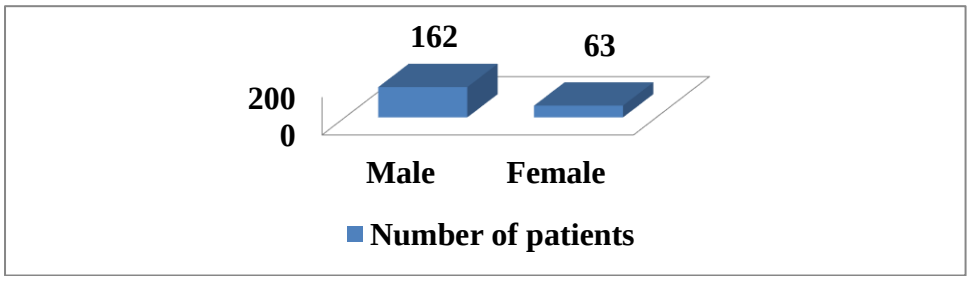

Fig 1: Gender wise distribution of patients with maxillofacial injuries

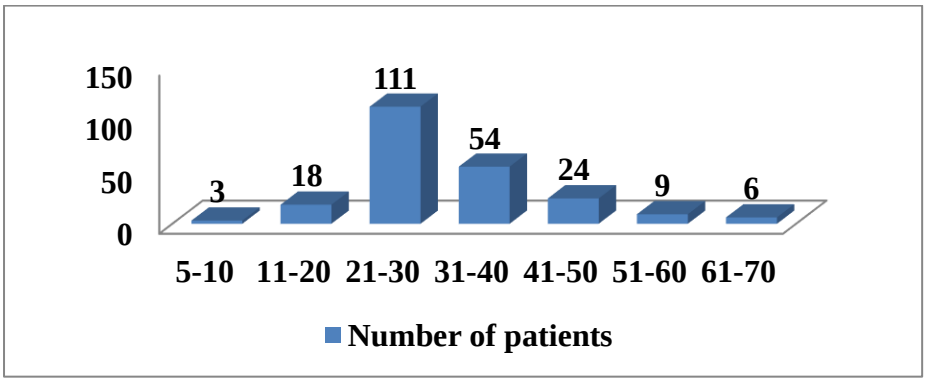

Fig 2: Age wise distribution of patients with maxillofacial injuries

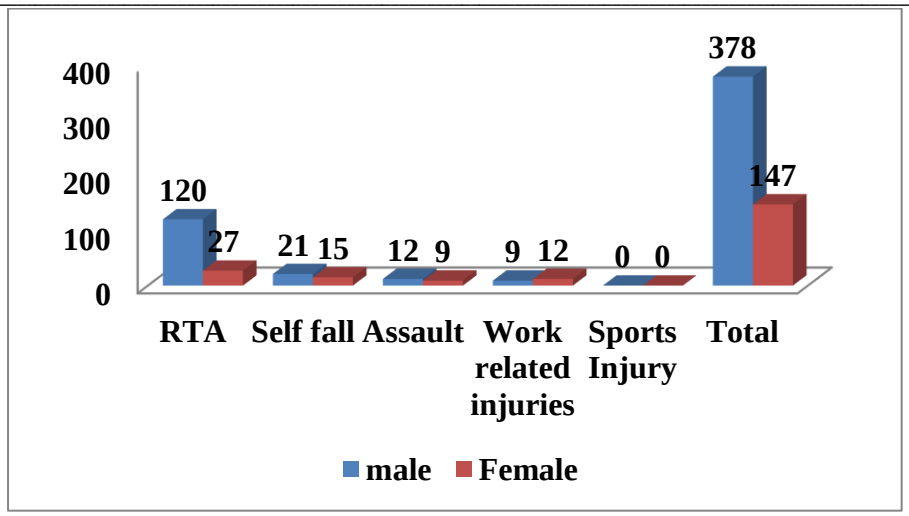

Fig 3: Mechanism/Etiology of maxillofacial injuries

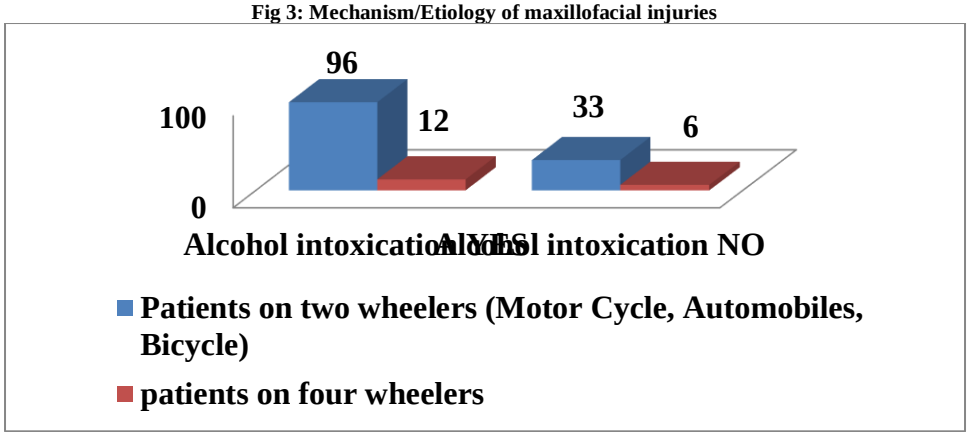

Fig 4: Types of vehicle used and association of alcohol consumption

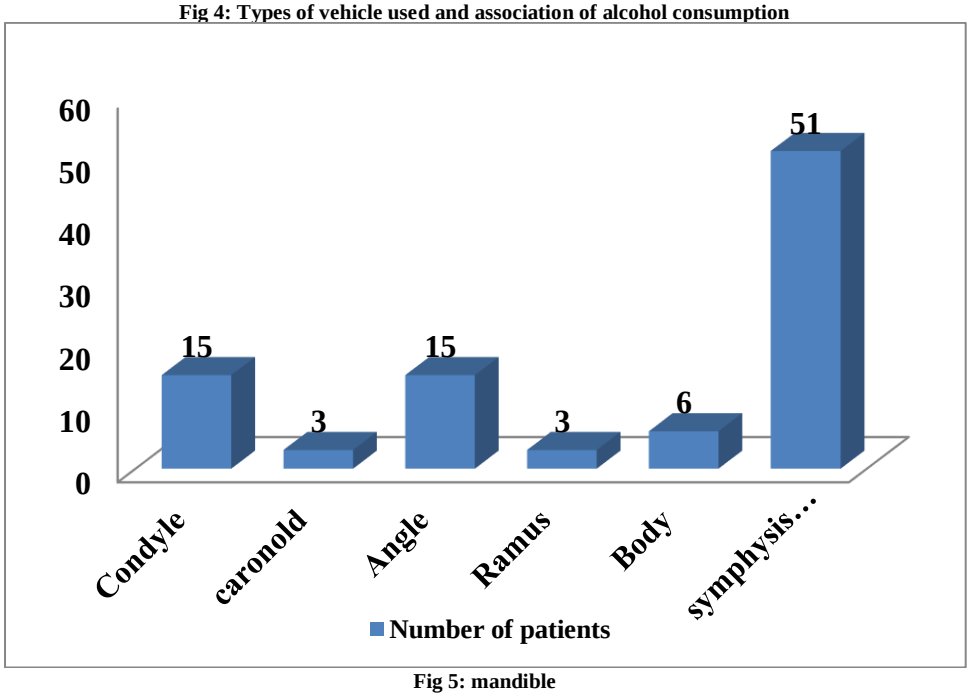

Fig 5: mandible

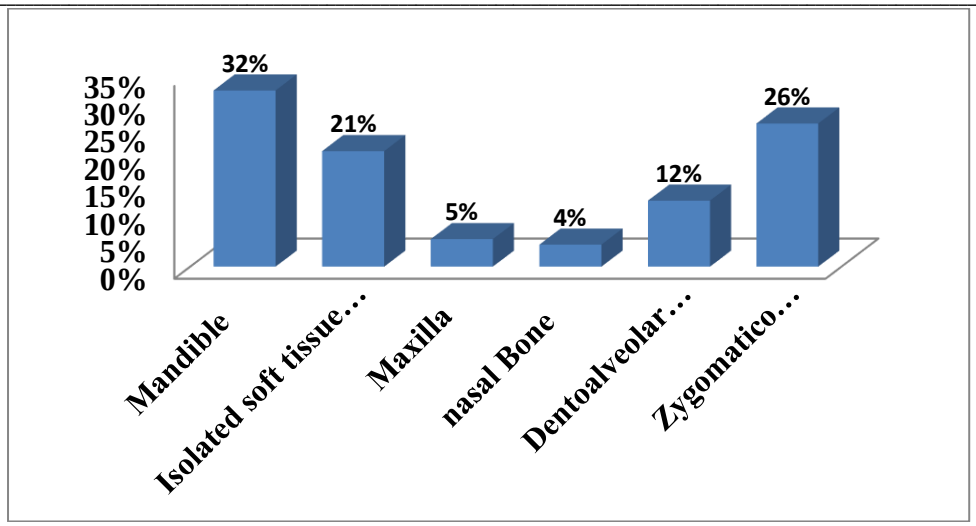

Fig 6: Percentage

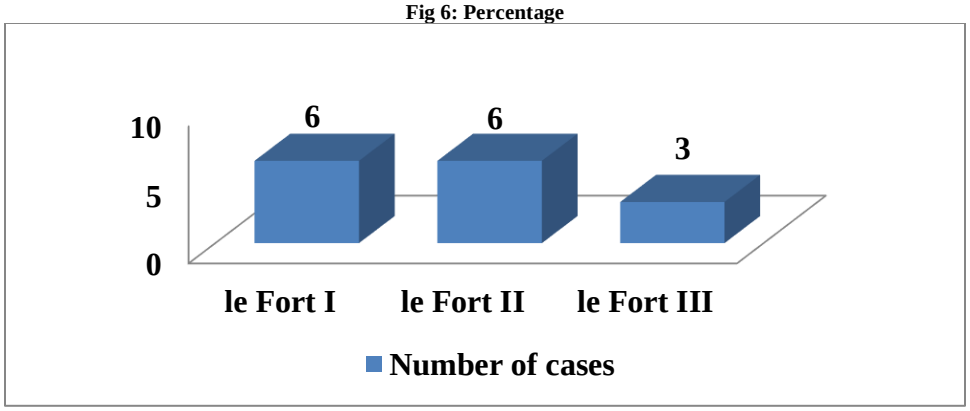

Fig 7: Maxilla

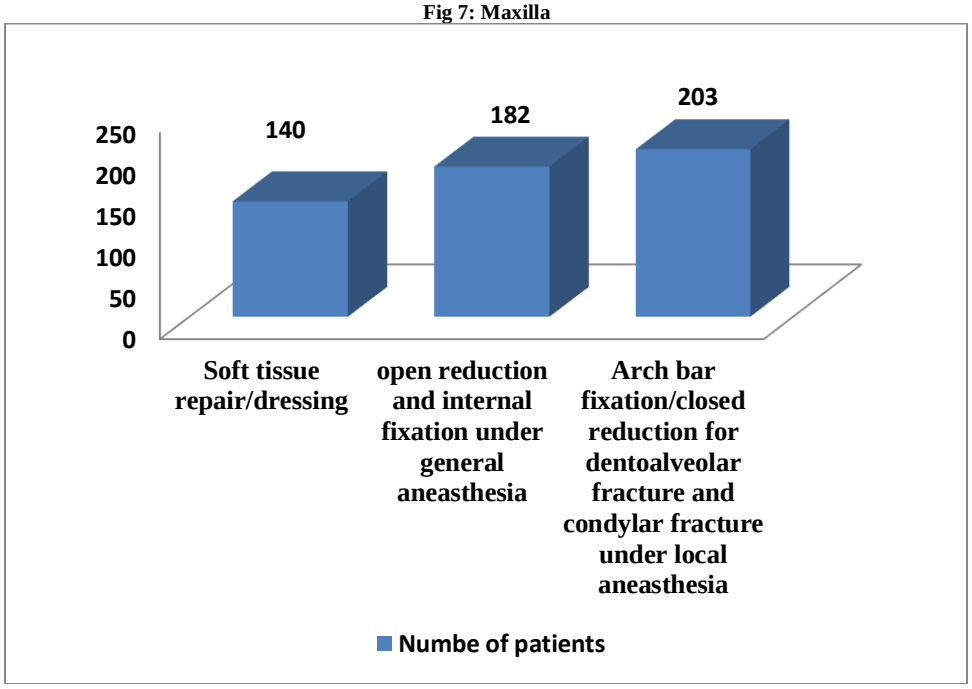

Fig 8: Analysis of treatment and type of anesthesia given

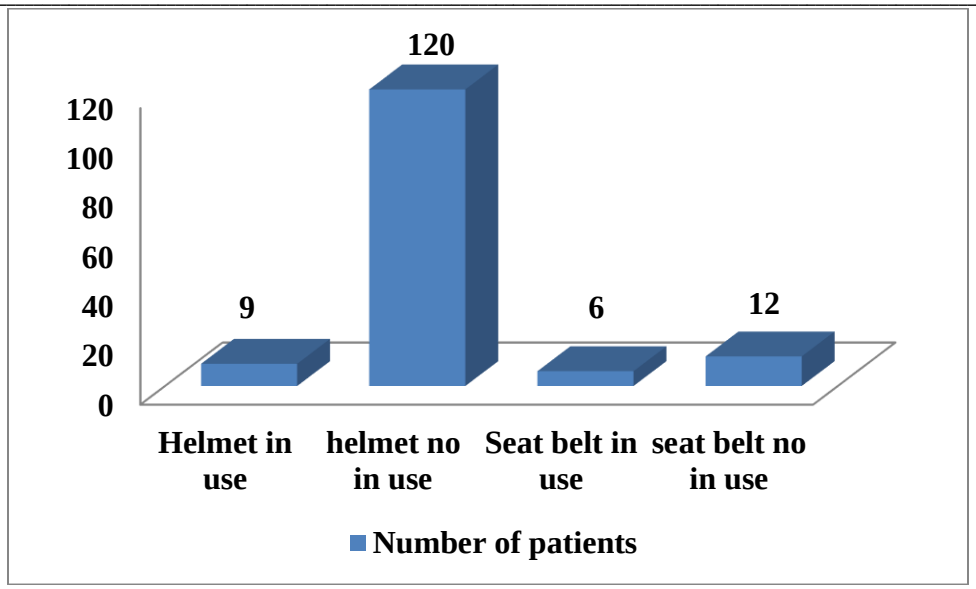

Fig 9: Analysis of restraint device used at the time of injury

Discussion

Trauma is one of the major causes of death among people under 40 years of age 11. The cost of injury is higher than those of any other health problems and roughly equals to the costs associated with heart diseases and cancers. The number of maxillofacial injuries is continuously associated with the use of alcohol and illicit drugs during driving leads to RTA. This account for 90% of the fatalities due to RTA occurs in developing countries. The average ratio of male to female was 3:1, this can be explained by the fact that in developing countries men are active member of the family and do remain outdoor for a larger period of time and are more vulnerable to alcohol consumption, accidents, assaults, violation of traffic than women. This finding is in accordance with findings reported by Shankar et al and Gupta R et al.In the current study the common age group affected was 21-30 years (49.3%) followed by 31-40 years (24%). This may be due to the fact that this age group is more active, suffer more traumas due to more outdoor activities, indulge in high speed and careless rash driving tendencies. This finding is consistent with study by Kapoor et al and Chandrashekahar et al. In our study the RTA was the most common cause of maxillofacial trauma (65.3%). And is consistent with Gandhi et al and Subhashraj et al. In rural India motorized two-wheeler vehicles are registered in more number (70%) compared to light/heavy motor vehicles. Since our institution is a referral center located in rural area with close proximity to National highway aid in predominantly treating low income group and their main mode of transportation are motorized two wheelers (bike, scooter) and bicycle. Among the patients with maxillofacial injuries, 129 patients used motorized two-wheeler (Category A) and 18 patients were on four-wheeler (Category B); among them 53.3% (120 patients) were male and 12% (27 patients) were female. In our study the commonest bone fractured was mandible 93 patients (32.26%), followed by zygomatico-maxillary fracture 75 patients 26.04%), dento-alveolar fracture 33 patients (11.4%), maxillary fracture 15 patients (8.32%) and nasal bone fracture 12 patients (4.16%). The isolated soft tissue injury was seen in 60 patients (20.8%). This findings are similar to previous studies reported in the literatures Shankar et al and Kapoor et al. Mandible is most vulnerable because of its position and predominance on face, osteology of mandible, the influence on the presence of developing or completed dentition all play a role in weakness of the lower jaw. The restraint devices (Semi-helmets) are not protective in lower part of face leads to easy mandible injuries. In our study 120 patients did not use helmets and 9 patients used helmets while driving. Also 12 patients wore seat belt and 6 patients did not wear seat belt. These results are consistent with Pandey S et al. Many authors have consistently linked alcohol abuse and motor bike accidents. Our study revealed 114 patients were under the influence of alcohol at the time of injury. These results are consistent with Singh et al and Prabhu et al. Reduction of drunk drivers and adaptation of safety devices reduces maxillofacial trauma severity.

Conclusion

RTA with two wheelers is the most common aetiology of maxillofacial injuries involving young adult (21-40 years) male patients. Mandible is most commonly fractured. Not using safety measures (helmets and seat belts) and also influence of alcohol are the major factors responsible for the injuries. Majority of the injuries are treated with closed reduction under local anaesthesia and ORIF were performed in indicated fracture patients. Preventive measures such as wearing helmets, wearing seat belts, reinforcement of road safety and traffic rules by traffic police, adherence to the traffic rules and regulations by the local people, provision of pedestrian path, segregation of heavy and light motor vehicles, denying insurance coverage to alcohol abusers, timely maintenance of faulty roads, endorsement of psychosocial aftercare programs to reduce the risk of re-injury and promotion of patient compliance should be introduced.

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