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RESEARCH ARTICLE

TO STUDY DEMOGRAPHIC VARIABLES AND EPIDEMIOLOGICAL DETERMINANTS ASSOCIATED WITH ROAD TRAFFIC ACCIDENTS COMING TO INDIRA GANDHI GOVERNMENT DENTAL HOSPITAL JAMMU

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ABSTRACT

The newest tragedy that has surged the death toll in past few years is deaths due to Road traffic accidents. RTA has now evolved to be major cause of deaths in our state. Hundreds of accidents occur every month in every nook of our state, needless to say, have culminated in unfortunate deaths of thousands of our young boys. Mostly the motor accidental episodes involve sheer negligent driving, rash driving especially by motorcycles, in and around city outskirts, truck collisions on the highways, overloaded passenger vehicles. In far flung districts that finally end up in Road Accidents. Aim of the study was to study demographic variables and epidemiological determinants associated with Road Traffic Accidents as reported in the tertiary care dental college and hospital of Jammu province.

INTRODUCTION

Road traffic accidents has emerged as potential though preventable health hazard, a significant public health challenge, projected to be the fifth leading contributor to the global burden of disease by 2030 (Mathers and Loncar, 2006). World Health Organization has defined accidents as "an unpremeditated event resulting in recognizable damage" (Aggarwal *et al.*, 2009). Road Traffic Accidents (RTA) are 'hidden epidemic' which though a priority has received much less attention (Road traffic accidents: the hidden epidemic, 2012). The alarming increase in mortality and morbidity owing to road traffic accidents has been a matter of great concern globally (Hazen and Ehiri, 2006). They involve high human suffering and socioeconomic costs in terms of premature deaths, injuries, loss of productivity, and so on. (Transport Research Wing, 2012) During 2008, Road Traffic Injuries (RTI) ranked fourth among the leading causes of death in the world. (WHO, 2011) Nearly 1.3 million people die every year on the world's roads and 20 to 50 million people suffer non-fatal injuries, with many sustaining a disability as a result of their injury. (United Nations Decade of action for road safety 2011-2020) Road traffic injuries are the leading cause of death among young people aged 15-29 years and cost countries 1-3% of the gross domestic product (GDP).

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(United Nations Decade of action for road safety 2011-2020, World Health Organization, 2013) If no action is taken, road traffic crashes are predicted to result in the deaths of around 1.9 million people annually by 2020. (World Health Organization, 2013) Hence the goal of the United Nations' Decade of Action for Road Safety 2011- 2020 is to save five million lives. (United Nations Road Safety Collaboration, 2013) With gigantic surge in the number of vehicles, the incidence and prevalence of road traffic accidents have increased in India. In India, the motor vehicle population is growing at a faster rate than the economic and population growth. The surge in motorization coupled with expansion of the road network has brought with it the challenge of addressing adverse factors such as the increase in road accidents. [Transport Research Wing, 2012] According to the World Health Organization (WHO), road traffic injuries are the sixth leading cause of death in India with a greater share of hospitalization, deaths, disabilities and socio-economic losses in the young and middle-aged population. (Ministry of Health and Family Welfare, 2004) Road traffic injuries also place a huge burden on the health sector in terms of pre-hospital and acute care and rehabilitation. (Gururaj, 2006) With respect to our state Jammu and Kashmir, the geographical and topographical modalities of the state make it more prone to road traffic casualties. The Jammu province of Jammu and Kashmir is a noteworthy hilly terrain of the shivalik hills with poor geographical and climatic conditions thus making it prone for Road Traffic Accidents (RTA). Mortality and morbidity in road traffic accidents have shown a

steady rise with many factors that contribute directly or indirectly towards this cause. Bad hilly terrain both along Intra state and intra district highways, along with lack of good quality roads, frequent landslides and avalanches along the NH1, drunken driving, high speed negligible driving & use of mobile phones while driving have contributed to increased cases of road traffic casualties. In addition to this, heavy snowfall and rain with Fog during winters hamper road traffic movements in this region and also contribute to road traffic accidents. In light of above mentioned factors, Indira Gandhi Government Dental College and Hospital is a premier tertiary care hospital of the Jammu province comprising of hilly districts of Doda, Kistwar, Rajouri, Udhampur, Ramban, Poonch, Reasi, Samba, Kathu and Jammu city. Major arterial highways connecting all the hilly districts pass through the hospital so pertinent to mention that our hospital receives maximum cases of road traffic accidents. Thus, this retrospective study was considered to study demographic variables and epidemiological determinants associated with Road Traffic Accidents in Jammu province and also To identify the various presenting injuries associated with Road Traffic Accidents so that further planning in terms of preventive measures, as well as management protocol in the Golden Hour in early intervention in Road Traffic Accident can be carried.

Objectives of our study

1. To study demographic variables and epidemiological determinants associated with Road Traffic Accidents in Jammu province
2. To identify the various presenting injuries associated with Road Traffic Accidents.
3. To highlight the importance of Golden Hour in early intervention in Road Traffic Accidents.

MATERIALS AND METHODS

The current Cross - Sectional study was carried out at Indira Gandhi Government Dental College and Hospital Jammu after obtaining ethical approval from hospital ethical board. The study included 100 consecutive cases of Road Traffic Accidents (RTA) admitted through emergency in the Department Of Oral And Maxillo Facial Surgery of the Hospital from July 2016 to January 2017. For the purpose of this study, Road Traffic Accident (RTA) was defined as an accident which took place on the road between two or more objects, one of which must be any kind of a moving vehicle. Data was collected by interviewing the victims of RTA either in the casualty or in the wards of Associated Hospital, with a pretested questionnaire, also where the condition of the victims did not warrant the interview, their relatives or attendants were interviewed. The study Data that was collected included demographic variables (age, gender, area of state) and epidemiological determinants (time of accident, type of vehicle involved), presenting injuries, ED management in the Golden hour.

The inclusion criteria

The inclusion criteria that was followed included patients of all ages reporting to Department Of Oral And Maxillo Facial Surgery of Indira Gandhi Government Dental College and Hospital or being referred from primary or secondary care hospitals of the jammu province of the state, due to road traffic accidents.

The exclusion criteria

The exclusion criteria followed was that any patient with an injury on road without involvement of the vehicle (e.g. person slipping or/and falling on the road, intoxicated with alcohol or other drugs), an injury with a stationary vehicle (e.g. Person getting injured while washing, cleaning and boarding a vehicle), cases which were uncooperative and unwilling for interviewing and cases where enough data was not available. The obtained data was entered into Microsoft excel, double checked for errors and analyzed using Microsoft Excel 2007 and SPSS version 22.0. Interpretation of the collected data was done by using appropriate statistical methods like percentages & proportions.

RESULTS

Table-1 depicts demographic variables associated with road traffic accidents. 78 patients (78%) of Road Traffic Accidents were males and only 22 (22%) were females. Majority of the patients i.e 38% were between age group of 21-30 followed by 26% in the age group of 31-40. Whereas 17 % in age group of 11-20 years, 10% patients were in age group of 41-50 years and only 3 % were less than 10 years of age, rest 6% were 51-60 years of age or above. It is important to mention that maximum number of victims were between 11-40 years of age constituting 81% of total victims of road traffic accidents i.e. more young patients were involved in road traffic accidents.

Table 1.

Demographic variables		
Gender	No. of cases	Percentage
Male	78	78%
Female	22	22%
Age	No. of cases	Percentage
<10	3	3%
11-20	17	17%
21-30	38	38%
31-40	26	26%
41-50	10	10%
51-60 and above	6	6%
total	100	100

Table 2 Most number of patients 73 (73%) were from rural and hilly areas of the state compared to 27 (27%) who were from Urban areas of the Jammu province.

Table 2.

Area of the state	No of cases	Percentage
Rural / Hilly districts	73	73%
Urban	27	27%

Table 3 depicts time of the day of occurrence of accident. It shows that majority of the accidents i.e 42% occurred between 4.00 pm to 8 pm followed by 8.00 am to 4.00 pm (36 %) and rest 22 % in between 8 pm to 4 am.

Table 3.

Time of accident	No of cases	Percentage
8:00 am – 4:00 pm	36	36%
4:00 pm – 8:00 pm	42	42%
8:00 pm – 4:00 am	22	22%

Table 4.

Type of vehicle involved	No of cases	Percentage
Bus accident	27	27%
Car (head on collision)	13	13%
Bike accident	17	17%
Truck collision	13	13%
Pedestrian hit by vehicles	30	30%

Table-4 shows the type and vehicle involved in road traffic accident. 27 % accidents reported were bus accidents in rural areas of Jammu province, 13 % involved head on collision of cars, 13 % depicted truck collision on national highway NH1A, 17% were bike accidents and maximum 30 % involved in road traffic accidents were pedestrians hit by moving vehicles.

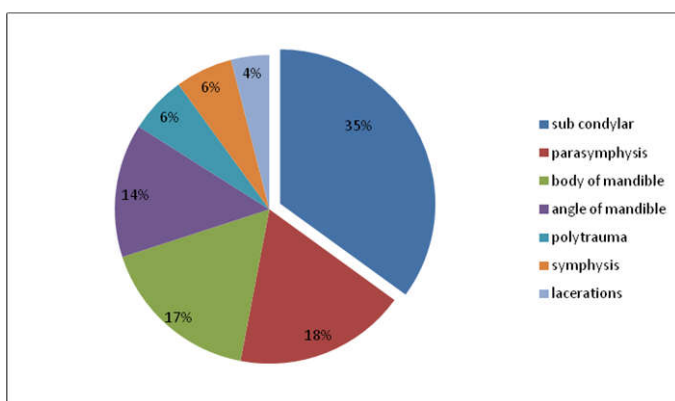
**Chart 1. Pattern of injury 1**

Chart 1 depicts the pattern of injury as examined in department of oral and maxilla facial surgery. Maximum patients 35 % had sub condylar fracture, followed by 18% parasymphysis, 17 % had fracture of body of mandible, 14 % had angle fracture and 6 % had symphysis fracture. Only 6% patients had polytrauma involving maxilla facial as well fracture of lower or upper limbs and 4 % had lacerations in maxilla facial region.

Table 5. ED intervention given in golden hour before referral to tertiary care

ED intervention	No of victims	percentage
Dressing only	64	64%
Laceration repair	23	23%
Splinting /Fracture reduction	8	8%
Intubation	5	5%
TOTAL	100	100%

Table 5 shows the ED intervention that was given to patients in Golden hour, before being referred to Tertiary care hospital. Maximum cases of Road traffic accidents 64 % were treated with dressing only, 23 % patients had suturing done in lacerations, while only 8 % were referred with initial splinting or minimal reduction of fracture and only 5 % were intubated before referred for further treatment.

DISCUSSION

The present study shows that there has been a steady rise in the number of road traffic accidents in Jammu province which may further show increase if proper intervention is not made. In our study, majority of the RTA victims 38 % were in the age group of 21-30 years wherein 78 % were males and 22 % were females. Our findings show consistency with previous studies

(Rastogi *et al.*, 2014; Singh *et al.*, 2005; Kumar and Srinivasank, 2013) which also indicate that injuries occur in more productive age group as they are more vulnerable to injury due to their active life style & more involvement in outdoor activities. In our study, males were predominantly involved in Road Traffic Accidents, this observation is supported by the previous studies by Ganveer *et al.*, Ngo Anhetal, Dovom *et al.*, Mohammad *et al.*, Thomas *et al.* (Ganveer and Tiwari, 2005; Ngo *et al.*, 2012; Zangooui Dovom *et al.*, 2013; Mohammed, 2011; Thomas and Sridhar, 2013) where all the researchers had observed remarkable difference in the gender variation in the victims of road traffic accidents. Analyzing the time of RTA, it was seen that, maximum incidents of Road Traffic Accidents occur within the time zone of 4:00-08:00pm and 8:00am-4:00pm Our results derive from the fact that these are the time periods when there is huge rush hour and human movement is maximum owing to school and office hours. These hours are also busiest as there is heavy rush of commuters coming from other hilly districts to Jammu province. Jammu being a connecting link between other provinces' of the state and rest of the country. Other studies by Thomas *et al.*, Goswami *et al.*, Khajuria *et al.* also share the same views (Thomas and Sridhar, 2013; Goswami and Sonowal, 2011; Khajuria *et al.*, 2008). Verma *et al.* (2004) in a study conducted in Delhi found that majority of the accident victims belonged to rural area. (World Health Organization, 2011) This pattern is also similar to our study that 27% of RTA cases were found to be due to Bus accidents in rural areas of Jammu province. In addition to that, pedestrians constituted 30% of the road users involved in RTA, followed by 17 % bike riders (13%) car drivers and 13 % truck driving collisions. Similar results were also observed at other places (Mehta, 1968; Sathiyasekaran, 1991; Dhingra *et al.*, 1991; Ghosh, 1992; Chunli *et al.*, 1991; Verghese, Mohan, 1991). Our study also acknowledge the role of helmets & seatbelts and advocate equivocally their role in prevention of severe head injuries. the pattern of injury as examined in department of oral and maxillo facial surgery shows that maximum patients 35 % had sub condylar fracture, followed by 18% parasymphysis, 17 % had fracture of body of mandible, 14 % had angle fracture and 6 % had symphysis fracture. Only 6% patients had polytrauma involving maxilla facial as well fracture of lower or upper limbs and 4 % had lacerations in maxillo facial region. The pattern of injuries differs slightly from other studies (Qi *et al.*, 2006) which show fracture of extremities (53.3%) occurred most often, followed by craniocerebral trauma (19.4%), thoraco-abdominal Visceral injury (6.56%), spine fracture (5.37%), fracture of ribs (4.88%) etc.

Our study also depict that ED intervention that was given to patients in Golden hour, before being referred to Tertiary care hospital was dismal. Maximum cases of Road traffic accidents 64 % were treated with dressing only, 23 % patients had suturing done in lacerations, thus Dressing &/laceration repair were given in 2/3rd of the cases and patients were referred to tertiary care hospital for further treatment. Thus setting up of primary and secondary level trauma centre's with better trained oral and maxilla facial surgeons in handling such head and facial injuries, would greatly help in reducing the patient load in tertiary hospitals. In emergency medicine, the early one hour of time following an accident is called as GOLDEN HOUR, during which the chances of death of accidental victim are minimized provided a prompt medical intervention and early rehabilitation is done. Evidence in favor of the golden hour can be taken from two of the most significant studies that show a

significant correlation between reduced out-of-hospital times and decreased mortality rates were from Quebec in the 1990's. (Sampalais et al., 1993; Sampalais et al., 1999) The 1993 study by Sampalais et al. (Road traffic accidents: the hidden epidemic". 2012) found that total pre-hospital time over 60 minutes was associated with a significant increase in the odds of mortality. The 1999 study by the same group found that reduced pre-hospital time was associated with reduced odds of dying, when outcomes were controlled for the severity of injury and age of the patient. Additionally, reduced pre-hospital time has been found to be beneficial in specific patient populations, including severe head injuries (Dinh et al., 2013; Tien et al., 2011). Hence chances of survival manifolds if a patient receives good early care at or near the accidental site. Oral Maxillofacial surgeons role in the Treatment of life-threatening facial traumatic injuries, during and immediately after the golden hour is to provide not only an expert advisory service but also a definitive repair that will depend on a number of factors related to the patients' general status, overall prognosis and other planned procedures. Population-based evidence supports a 15 to 20% improved survival rate among seriously injured Patients with trauma system (Mullins and Mann, 1999). Our study advocates that the role oral and maxillo facial specialist to be made an integral part of health care especially at the primary health care and sub district to district levels as its role in treatment of traumatic injuries in accidents is paramount. ER physicians and oral surgeons should be trained in laceration repair, dressing, splint/fracture/Dislocation and reduction, ICD insertion, intubation for better management of trauma patients. This view is consistent with a study that shows that patients had significantly lower rates of missed major or life-threatening injuries when treated by specialists trained in managing trauma than those without specific training (Lin et al., 2012)

Limitation of the study: Being a retrospective study, it has its own limitations of depending on the data provided by case records/questionnaire of RTA victims and also being one of tertiary care dental hospitals of the state, results cannot be generalized to the entire State population, other than Jammu province.

Relevance of the study: The study would be relevant to the, Government of Jammu and Kashmir, Road Transport Authorities of Jammu province, department of Health for making appropriate interventions and bridge all shortcomings highlighted for causing RTA in this region.

Conclusion

Besides the strict enforcement of traffic laws, road safety measures good quality roads and responsible driving by people of our state we advocate the importance of Golden hour in management of head and facial injuries that should strictly be followed. Well trained & adequately staffed primary, secondary & tertiary level trauma centers should be dedicated to managing RTA victims only. ER physicians along with oral and maxilla facial surgeons should be trained in identifying & treating life threatening injuries as part of basic intervention that is required in trauma patients during Golden hour.

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