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Profile of chest injuries due to blunt trauma among road traffic accident victims autopsied in urban civilized life

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Abstract: *Background:* Road traffic accidents are as war on the roads and it takes the lives of approx 1.2 million individuals around the world. It is direct effect of modern day urban civilization. Occupied time between the accident and reaching the hospital is life-threatening and that is a very important gap to provide medical first aid to the victims. In urban life, 75% of thoracic trauma follows blunt injury. Greatest difficulty is faced in their management and long time in diagnosis. Hence, objective of study is to get knowledge of the blunt chest injuries among accident victims travelling in different modes of road transportation. *Material and Methods:* Data was collected from 100 cases of death by road traffic accident that were brought for medico-legal autopsy at the mortuary of Forensic Medicine Department, Rajrajeshwari Medical College and Hospital Bengaluru, during the period from December 2013 to May 2015. *Results:* Out of 100 cases studied, high risk of age of the victims were between 21-40 years (male 43.9% and female 44%). Males (82%) included the majority of victims as compared to females (18%) in the ratio 4.5:1. Most of the victims died on spot or within 6 hours of the incident (80%). Two-wheeler occupants (62%) were the commonest victims involved in RTA. Most of the RTA occurred in highway roads (78%). Most of patients succumbed on the way to hospital (54%). *Conclusion:* All blunt thoracic traumas constitute potential factor in increasing the amount of morbidity and mortality and therefore proper attention towards their accurate diagnosis and satisfactory management is mandatory. Last but not the least; a multidisciplinary approach is required for treating trauma victims.
Keywords: Road Traffic Accident, Blunt trauma, Chest injuries.

Introduction

Modern day urban civilization bears a real direct cause and effect relation with Road Traffic Accidents. Accidents are reverse reaction of today's urban life. It is considered as modern-day epidemic. Globally it takes life of around 1.2 million individuals and injures approx 50 million persons per year. In South-East-Asian countries, one of the top 5 causes of mortality and morbidity is Road Traffic Accident (RTA) [1-2]. In India the death frequency in road traffic accident has been testified to be about 20 times greater than the other developed countries [3]. Global survey of about 2 traffic impacts in 2013 by the UN World Health Organization showed road fatality rate to be of 16.6 per 100,000 people in India [4].

This ever-expanding epidemic is aiming mainly the young and prolific generations [5]. The mortality as well as the morbidity rate because of Road traffic accidents is very high when compared with the same due to malaria, tuberculosis, diarrhoea and even cancer. Scientists are persistent and consistent

towards the cure and prevention of diseases like smallpox, polio, tuberculosis, malaria, heart attacks and cancer, but no substantial initiative worth mentioning is being done against this specific epidemic of road side accidents.

The present day data compilations of India reveal that there is one road accident every single minute and one road accidental death every four minutes, which is convincingly the highest in the world. More so recently, India has observed a steady rise in road fatalities. Narrow and substandard roads here are usually the major cause of road traffic accident, which cause mechanical trauma. Surprisingly, the most common amongst is thoraco-abdominal trauma and the cause is road traffic accident followed by pedestrian accidents, abdominal blows and fall from height [6].

Trauma is one of the chief preventable causes of death in developing countries, and counted as major health and social problem. In urban life 75% of thoracic trauma follows blunt injury. Extreme difficulty in their management is to fail in the timely diagnosis. This is largely due to masking of thoracic trauma with associated injuries like head injury, abdominal trauma and bony injury. Since the chest cavity contains the vital organs like lung, heart, great vessels hence chest is the most susceptible region of body and trauma in this region have been considered very serious. It challenges the integrity and even the viability of the individual.

Early diagnosis of the injury and instant treatment are mandatory to save the lives of many of these patients. Repeated clinical examinations and observations for the appearance of clinical signs and symptoms in persons with chest injuries are more important than any other investigation. Increasing chest injuries may be because of many factors such as fast moving vehicular traffic, vast urbanization, rapid industrialization etc. The risk to rider or pillion increases by many folds during ride such as faulty vehicle, faulty rider, unfavourable environmental conditions and overloaded vehicle. Majority of deaths of trauma victims have medico-legal implications. It is therefore necessary to establish the cause of death to get compensation from the State or from insurance agencies.

Hence, the aim of this study is to identify the pattern of chest injuries due to blunt trauma among road traffic accident victims autopsied at Rajrajeshwari Medical College and Hospital, Bangalore and to establish relationship between the extent, nature and type of chest injuries and survival time, age, sex, and type of trauma involved from the autopsy findings so as to extend the knowledge of the medical faculty in the field of early diagnosis and management of such injuries.

Material and Methods

Purposive sampling method was applied for present study. 100 death cases of blunt thoracic trauma by road traffic accident, brought for medico-legal autopsy at the mortuary of Forensic Medicine Department, Rajrajeshwari Medical College and Hospital Bangalore, during the period from December 2013 to May 2015 included as the material for this study. Decomposed bodies and those cases where the nature of sustenance of injury was not known were excluded from this study.

The epidemiological and sociodemographic characters linked with victim's accidents were gathered from the papers sent by the police namely Inquest report of Karnataka police and details from concerned police constables, investigation officers and authorities, witnesses of the incident, relatives, attendants, friends and others accompanying the dead body. A detailed Performa for the purpose of recording history and epidemiological data with special reference to the nature of wound, site of impact by vehicle, type of road, place of death of the victim, time of incidence, survival period of victims following incident and other relevant data related to victim was prepared for the present study.

Statistical Analysis: Data were prepared in Excel and coded with specific key words to maintain confidentiality of the victim. Statistical evaluation was performed by using Statistical Package of Social Sciences (SPSS) system 20. Statistical tests done are in percentage and proportion.

Results

Table-1: Age & Sex distribution of cases (N=100)			
Age	**Male N (%)**	**Female N (%)**	**Total N**
0-10	0 (0%)	1 (5.55%)	1
11-20	2 (2.43%)	2 (11.11%)	4
21-30	36 (43.90%)	8 (44.44%)	44
31-40	21 (25.60%)	2 (11.11%)	23
41-50	10 (12.19%)	5 (27.77%)	15
51-60	8 (9.75%)	0 (0%)	8
>60	5 (6.09%)	0 (0%)	5
Total	82	18	100

Table-2: Distribution of accidental cases according to type of roads (N=100)			
Type of Road	**Male N (%)**	**Female N (%)**	**No of Cases N (%)**
Highway Road	62 (75.6%)	16 (88.8%)	78 (78)
City Road	16 (19%)	0	16 (16)
Village Road	4 (4%)	2 (11%)	06 (6)
Total	82	18	100

Table-3: Distribution of cases according to the period of survival and types of road users (N=100)						
Survival period in hours	**Pedestrian N (%)**	**Two wheeler Rider N (%)**	**Two wheeler Pillion N (%)**	**Driver N (%)**	**Passengers N (%)**	**Total N**
<6	16 (80%)	50 (80%)	5 (83%)	1 (50%)	8 (80%)	80
6-12	3 (15%)	6 (9%)	0	1 (50%)	2 (20%)	12
13-18	1 (5%)	1 (1%)	0	0	0	2
19-24	0	0	0	0	0	0
>24	0	5 (8%)	1 (16%)	0	0	6
Total	20	62	6	2	10	100

Table-4: Distribution of cases according to the place of death	
Place of Death	**No of cases N**
Spot Death	16
Brought Death	54
Hospital Death	30
Total	100

Discussion

This study was conducted at Bangalore and included large population of Bangalore South district and surrounding places. Rajrajeshwari Medical College and Hospital, Bangalore is a General Hospital where cases come from many health centres. This study included victims of blunt chest trauma of RTA, which were autopsied at the mortuary of RRMC& H Bangalore. According to our study high risk of age group is 21-30, 36 cases (43.9%) of blunt chest injury followed by age group 31 - 40, 21 cases (25.6%). (Table 1) This was supported by the study of Dr. Harnam Singh et.al. [7] that found 27.3% maximum cases of age between 21-30, and Reddy NB et.al that found maximum 50% cases between ages of 21-40. Other previous studies conducted by Raju S Iyer [8], A.L. Ghangale [9], R.V. Kachre [10], D.Harish [11] and Pathak Manoj Kumar [12], also observed same results. It is due to that that young generations are prime earners and responsible for their family and remain out doors during most of the day, while late age group persons spend most of their time indoors. In our study more of the victims were male (82%) in ratio with female 4.5:1. (Table 1) Study of Reddy NB et.al. And Serife Tuba Liman [13] also observed same result, 92% and 70.6% male respectively. This finding is also similar with the other studies [14-15].

Both male and female lies between the age group of 21-30. This male dominance is explainable by the fact that in majority of families, males are the working and earning members, hence exposed to hazards of road, while females usually stay in and look after the household work in India.

In our study, highway road 78 cases (78%) accounts for the majority of chest injuries sustained in RTA which is followed by city roads 16 cases (16%) (Table 2). This finding similar to most of the studies [16].

In our study maximum victims of blunt chest injury succumbed to death within 6 hours i.e., 80 cases (80%) followed by within 6 to 12 hours 12 cases (12%). 06 cases (6%) survived for more than 24 hours (Table 3). This is line with case studies done by Dr. Y.N. Singh [17], Meera Th [18] Srinivasulu Pothireddy [19], Dr. Hamam Singh [7] and A.L. Ghangale [9].

The period of survival has not shown any improvement despite the advancement of medical facilities. It was also observed that major part of victims of blunt chest injury are two-wheeler occupants accounted for 62 cases (62%) followed by pedestrians 20 cases (20%) (Table 3). Similar results were observed in the studies conducted by Ganveer GB [20], Pathak Manoj [12] and Srinivasulu Pothireddy [19] on road traffic accidents. While Dr. Hamam Singh [7] A.L. Ghangale [9], D.Harish [11] and contradicted with our study who found pedestrians were maximum number of fatalities.

80% of two-wheeler occupants and pedestrians who were victim of blunt chest injuries succumbed to death within 6 hours. It shows survival period is not significant according to type of road users victims (Table 3). Recently the increase fatality of motor cyclist/ scooterists / two-wheeler occupants is due to rash and negligent driving, adventure seeking, surpassing, and less stability of the vehicle. Besides, these vehicles are mostly used by 15-50 years age group.

The deceased due blunt chest trauma succumbed on way to hospital 54 cases (54%), followed by hospital deaths 30 cases (30%) and spot dead in 16 cases (16%) (Table 4). Similar results were observed in case studies done by Raju S lyer [8], A.L. Ghangale [9], R.V. Kachre [10], D.Harish [11], Pathak Manoj Kumar [12] and Srinivasulu Pothireddy [19]. High rate of deaths on the way to hospital could be explained by waste of the time during the incidence and bringing of the victim to the doctor despite emergency 108 ambulance services.

Conclusion

In road traffic accidents, young age group and specifically the males are usually injured or lose their life. Early recognition of the injury and instant treatment are mandatory to save the lives of many of these patients. Repeated clinical check-ups and observations are more important for the appearance of clinical signs and symptoms in persons with chest injuries than any other investigation.

This study will certainly help the authorities to take safety measures in implementing stringent traffic rules, to help the stratification of associated risk in the susceptible civilization in educating them. More importantly to help the authorities in planning the better availability of health care resources on roads.

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