



A WATCHFUL EYE : THE STRATEGIC IMPLEMENTATION OF TRAMA SURVEILLANCE SYSTEMS

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ABSTRACT

Introduction: In developing countries like India injury related mortality is one of the greatest global public health issue contributing to about 12% of global disease burden .The economic burden is of major concern and the main cause of morbidity among the younger age group . This significantly affects socio demographic variables (7,13).The policy formulation and preventive strategies are still in developing stage due to lack of adequate data on injury characteristics , pertaining to its causes, prognosis and outcome.(1,3) The local data in combination with accident and emergency departments data would enable to develop treatment protocols for serious and life threatening injuries which would enable to decrease the mortality(13). The present study is an initial attempt to generate data on injury characteristics , pattern and outcome of injuries with a future aim to establish an Injury surveillance system (ISS) . **Methods :** The study was conducted at hospital emergency department of a tertiary care hospital of telangana , a pre organised hospital evaluation sheet was used for collecting the data, mean values of groups were compared and p value less than 0.05 is considered statistically significant . **Results :** The study results suggest that majority of them were males (74.16%), females constituted (25.84%) .Road traffic accidents followed by fall from height contributed to major mechanism of injury, first aid measures were undertaken for very few patients and no major prehospital interventions were done for the patients referred from primary health centers. **Conclusion :** Road traffic accidents contributed to the majority of the burden on trauma , Timely intervention with emphasis on preventive strategies is the need of the hour .

KEYWORDS : RTS –Revised Trauma Score , ISS –Injury surveillance system IDB –Injury Data Base , PHC- Primary Health Centre

BACKGROUND :

Injury can be defined as physical damage caused due to any force, high energy impact or varied mechanisms .Multiple patho physiological factors contribute to trauma burden and present as varied patterns of injury with different severity grade and prognostic value . Multiple risk factors which include behavioural patterns , variables like cultural , occupational factors and economic conditions contribute to trauma .

Rapid evaluation and treatment to save life is a prerequisite to prevent life long disability . Varied hospital and institutional protocols and clinical and surgical practices at trauma centres are being used for treatment .

Establishment of standard protocols and guidelines in health care sector with capacity building by including structured and accredited emergency departments as a mandatory and essential health service providers and developing a standardized referral system by providing timely transport facilities from primary health centres to referral and tertiary care hospitals is the need of the hour in developing countries like INDIA.

Golden hour trauma resuscitation : The concept of golden hour in trauma was introduced by Adams Cowley , their exists a golden hour between life and death , seriously injured patients if intervened in this time , that is less than 6 hours from time of injury can prevent irreversible damage to the human body. The concept of Trauma care resuscitation revolves around this time that is definitive resuscitative care should be initiated in the window period .⁽²⁾ .

Creation of the emergency and trauma systems of care hopefully would bring down the mortality rate globally ,

and would further contribute to the creation of long term and sustainable developmental plans^(6,7) . Maintenance of trauma registry services to assess the incidence , prevalence , would aid in the policy formulation and contribute to the improvement of preventive measures .

Injury data base (IDB) system is a recent development and still in the process of evolution in recent years and is being contributed by various projects undertaken for data acquisition . Information about injuries is required at both national and local levels . (Magnus et al). Injury data is used nation wide by various public sector offices for decision making and to formulate policies by various researchers at institutional level. Injury data collection is also being done in the development of various health services and for setting priority standards and safety policies for assessment of interventions at various levels^(1,5) .The term surveillance actually includes continuous scrutiny of systemically collected data , its analysis and interpretation . It is a design adopted to analyse the problems at various levels and design appropriate preventive strategies at various levels . It is of public health importance and is being formulated for detailed analysis of information of injury characteristics , cause , mechanism and outcome of injury , It lays foundation for development of trauma care and injury prevention and control .

So generating database and development of robust surveillance system with sustainable goals is the basis for implementation of effective interventions and a standard systems of care .^(2,5)

Objectives :

The research objectives formulated are as follows:

The present study is done to

- 1) To explore the epidemiological characteristics of injured

patients

- 2) To study the most common injury mechanisms and possible outcomes of patients presenting to the emergency department of the tertiary care hospital.

Methods : The study was conducted at the emergency department of the tertiary care hospitals of Telangana state , data was collected during December 2022-June 2023 .

The trauma evaluation form is a form developed by the emergency department of the tertiary care hospitals , which includes information of patient demographic characteristics , mechanism of injury, injury-related physiologic (arterial pressure, respiratory rate, neurological status) variables and clinical outcomes . Descriptive statistics were calculated for baseline characteristics, injury parameters and clinical outcomes using appropriate statistical software and methodology. Chi-square test was done to study the association between different types of injuries and demographic variables.

Analysis

A total of 800 patients were enrolled in the study ,patients with inadequate data and few pediatric patients were excluded from the study , data collected was stored and subjected to analysis using spss software version 26 , and subsequently statistical results are interpreted.

Socio-demographic profile

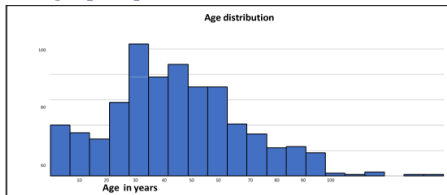


Figure I : Age wise distribution of injured patients(n=785)

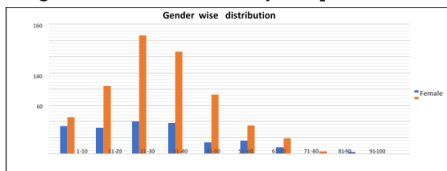


Figure II: Gender wise distribution of patients (n =785)

Injured patients had a mean age of 33 years (SD = 37.53) and majority were in the age group of 20-25 followed by 30-35. More males (74.16%) presented to the emergency department with an injury than females (25.84%). Students (28%) and unemployed (17%) were most frequently affected 14% of patients were manual labourers followed by office workers (10%). Farmers, security(/police), retired patients were less than 5%. Majority of patients had a primary education (46%) followed by secondary education (25%) and university education (21%).

Place of injury and transportation used :

85 % of the people presented to the emergency hospital were from the Hyderabad district. Out of 36 patients who transferred from another hospital, 46% were admitted to the hospital emergency ward and 42% of trauma occurred on the road (transportation accident) followed by 32% fall , 21 % of the injury occurred at the workplace, 4% at the school. Patients from all age groups were injured on transportation accident except in less than 15 years and more than 75 years , 55 % of female patients were injured at home compared to 20% of male patients. (p < 0.05) From the patients in study arriving at the emergency department, 38.5 % were brought by the ambulance. 28.1% of patients arrived by private vehicle, and 26.4% came by public transport followed by foot (5.04%).5

Causes of injury :

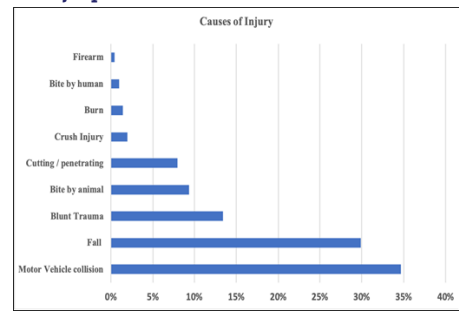


Fig III : shows the percentage of common causes of injuries in the patients presenting to the hospital(n=785)

Road traffic accidents, mainly vehicle collision was the common cause of the injury (35.6%) followed by fall (28.7%) and assault with blunt trauma (14.5 %).mainly motor vehicle collision is the most common cause followed by fall and assault in almost all age group . In patients with age < 10 years of age group, fall was the most common cause . Figure 5 shows the frequency of three most common causes of injuries in different age groups , except in motor vehicle collision. the pattern was similar in both the gender and in all the type of injuries, , 43% of female injured due to fall compared to 22% male (p < 0.05), 37.6% of male injured compared to 26% female .

Type of Road traffic accidents

In road traffic accidents , pedestrians (22.8 %) and drivers (48.6 %) were involved than passengers . Amongst the motor vehicle collisions , motor bikes were the most common type of vehicle (46 %), and majority 80% did not use helmets. Cars were the second most common vehicle (22 %) used .

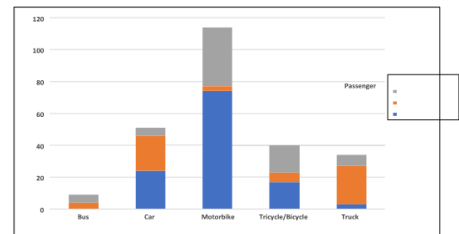


Fig IV : Number of patients involved in road traffic accidents - vehicle collisions (n=309)

Type and mechanism of injuries :

Majority of injuries were unintentional(600 (75%))followed by assault(144 (18%)) and self-inflicted injuries (45(5.6%)). Open wounds constituted (360 (45%)) majority of the intentional and unintentional injuries in both genders . Assault patients most commonly sustained blunt thoracic injury (160(20%)) . Head injury (16 (2%)) was the next most common cause of injury in patients presenting to the hospital with unintentional injury and assault.

The examined outcomes included mortality, length of stay, complications and total time to definitive care. Time to definitive care was longer for transfer patients; however, there was no evidence of differences in hospital length of stay. From the patients arrived at the hospital and enrolled in the study, 1.56% were severely injured compared to 92.6% who were mildly injured.

Table I : Injury Severity of patients with Revised Trauma Score(n=785)

Category of Injury	RTS Score	Percentage (n=785)
Severe	3 - 6	12 (1.56%)
Moderate	7- 11	45 (5.8%)

Mild	12	740 (92.6%)
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56% of patients were treated and sent home. Patients admitted to the hospital ward (37.6%) majority suffered from road traffic accidents (38.6%), fall (27.8 %) and blunt assault (13.3%)²⁶. 5.6% patient admitted to the intensive care unit with cutting/penetrating injury (31%) and traffic injuries (26.9%). Among the patients who died in the hospital, the most common cause was fall (55%). MVCs and blunt assault were the second most common cause (20%). Patients who died in the hospital, 75% had head injury with polytrauma and 20% had crush injuries to the extremities. Ten patients were taken to the operating theatre, in which half of the patients had MVCs, few patients were referred to higher centre⁽²⁰⁾

RESULTS AND DISCUSSION

Our study is one of the few studies in Telangana Hyderabad region which examined the epidemiology of injury presented to the emergency department of a tertiary care hospital. Majority of injured patients were the younger population in the age group of 20-25 followed by 30-35. The result is consistent with the other studies^{73,74} as well which show that injury affects productive youth of the country. In the study, more males were involved than females with a ratio of 2.8:1. Motor vehicle collision was the most common cause of the injury amongst all patients presenting to the hospital. It affected patients in the age group of 21-30, and 31- 40 where males outnumbered females. Other studies in different parts of India which examined the epidemiology of the MVCs suggested similar results⁷⁹⁻⁸².

Fall was the most common cause of the injury in the age group 1-10 and > 60 years in which the majority of injuries occurred at home, 25% injury occur due to fall at the workplace. Old age patients (>60 year) who were injured, majority had fall at home, 82% of patients were admitted to the hospital ward. Upper, lower extremity and pelvic fractures were the most common nature of the injuries. In the study, majority of injuries were unintentional (79%) followed by assault (15%) and self-inflicted injuries (6%). The patients presenting to the hospital, 39.25% were brought by the ambulance whereas 30.31% patients arrived by private vehicle, 22.35% came by public transport, 5.03% came with police (5.03%) and foot (3.07%). Patients who came by the public/private vehicles, the majority were injured due to fall and MVCs 44% needed hospitalization and two patients died. Another significant finding in the study was that the majority of the patient presented with the minimally severe injuries.

Regional systems of care have been developed to ensure that injured patients are managed in the most appropriate settings to meet their needs. Some severely injured patients are initially transported to local hospitals for stabilization prior to transfer to a centre resourced to meet their required level of care.⁸

These results emphasize the need for more rigorous evaluations aimed at understanding the outcomes for transferred trauma patients. Particularly, attention should be focused on examining this issue for both rural and urban environments. Further, most of these analyses take the perspective of the hospital care, thus those patients who do not survive to be transferred are excluded from the analyses.

CONCLUSIONS:

1. The results of the current study suggest that the burden of trauma, in particular severe trauma, is more in middle aged adult patients and is mainly due to road traffic accidents.
2. Emphasis on preventive strategies with further exploratory research in the direction of injury prevention and establishment of surveillance systems is the need of the hour.

Recommendations :

- 1.. There is a growing need to identify gaps in the population safety, collect information about injury occurrences, characteristics, outcomes and hospital-related care for effective prevention strategies, policy making, and legislation.
- 2.. Its important to incorporate trauma registry in the health care facility to ensure high-data quality and adequate population coverage.
3. A constant effort from the public and private sector, health care professionals as well as society is needed to improve and strengthen the trauma care in India. More research needs to be done to further explore the effective interventions.
4. We hope to see the recognition of the trauma registry and establishment of the nation wide data collection system that will generate relevant and timely data of injured patients in the future.

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