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Research Article

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Prospective and Retrospective Study of Prevalence, Pattern and Outcome of Trauma Patients in a Tertiary Care Government Hospital Study

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ABSTRACT

Background: Roadside trauma in India is an increasingly significant problem, particularly because of bad roads, irregular road signs, overcrowding, over speeding, and bad traffic etiquettes. Adequate information on the characteristics of victims, causes of accidents, frequency, vehicles involved, alcohol intake, and outcome of management is essential for understanding and planning for better management. **Aim**: This study aimed to determine the pattern, characteristics of polytrauma victims admitted to emergency trauma centers in India. The purpose of this study is to examine the epidemiology of trauma in western UP in India through data gained from the patients presenting in emergency centers and to analyze trauma patients to find the predictors that led to the deaths of trauma patients. **Materials and methods**: The present observational study involved trauma victims over 5-year period in three centers. Demographical details recorded were age, sex, alcohol intake, referral status, first aid taken, vitals on arrival, Glasgow Outcome Score (GOS) for head injury, risk factors, hospital stay, and outcome. **Results**: A total of 3000 patients were included in study. The mean age was 42.45 ± 15.7 years, the mean ISS was 13.82 ± 6.2, and the mean GCS was 12.20 ± 4.1. The mean time to admission at different trauma centres was 48.41 ± 172.8 h. The head injury was the most common (29.52%). **Conclusion**: According to this study, there is need for improvement in the referral services, the quality of first aid given, and for the development of good ambulance service with trained medical personnel accompany the patient is also required to improve rapid transport. We also noted high prevalence of head trauma in our study which enhance the need of neurosurgery Department.

Key Words: *Trauma Patients; overcrowding, over speeding*

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INTRODUCTION

A Trauma is a long-overlooked health problem deserves study. This study is conducted to understand and describe the incidence pattern, causes and mode of injury and outcome of the Trauma victim. Trauma had their own natural history and follow the same epidemic pattern as any other disease that is agent, host and environment interacting together to produce injury or damage. They occur more frequently in certain age group, at certain times of day and the week and at certain localities**.** *India, unfortunately ranks at the top with highest number of fatalities with about 11% share in the world. The total number of accident related deaths in 2018 stood at 1,51,417 indicate an increase of 2.3% over the figures for 2017. About 85% of the accident related deaths happen in the most productive age group of 18-60* [1]. India Loses approximately 2-2.5% of its GDP to only Road Traffic Injuries. There is still lack of proper documentation and Trauma registry in India. On an average per day 70-80 Trauma victim are reporting to Emergency Department every day. Strengthening the emergency care systems that serve as the first point of contact for so much of the world is essential to ensuring timely and equitable access to care for the injured. Effective injury care requires continuity of care across a range of platforms including first aid, pre-hospital care, facility-based emergency unit care, and early critical care and operative care as needed.

Providing quality support and care services to victims is therefore an essential component of any response to intentional and unintentional injuries. Appropriate services for victims of non-fatal injuries can prevent future fatalities, reduce the amount of short-term and long-term disability, and help those affected to cope with the impact of the injury event on their lives. For every person dying as a result of injury, there are hundreds more that sustain non-fatal injuries and other health consequences. Although the ultimate goal must be to prevent injuries from happening in the first place, much can be done to minimize the disability and ill-health arising from the injuries that do occur despite the best prevention efforts.

The present study is conducted in Trauma centre New Emergency SVBP Hospital MEERUT. An evaluative research approach is found to be most suitable for the attainment of the objectives of the prospective study. We will study the various trauma cases reporting to emergency department. All injured patients of any age presenting to the Emergency department will be included in the study. A pretested trauma profile form is to be filled at the time of arrival. Basic demographic characteristics, time and date, nature and cause of injury, vital signs, Trauma scoring outcome data will be recorded.

AIMS AND OBJECTIVE

To study Prevalence, Pattern and Outcome of Trauma Patients in western UP presenting in trauma centre/New emergency SVBP hospital Meerut in a period of five year from July 2016 to June 2021.

METHODS AND MATERIALS

The study will be carried out in the Department of Surgery in a tertiary care hospital in LLRM medical college, MEERUT. The nature, methodology, and risks involved in the study were explained to patients and informed consent was obtained. All information collected was kept confidential and patients were given full freedom to withdraw at any point during the study. All provisions of the Declaration of Helsinki were followed in this study.

METHOD OF COLLECTION OF DATA:-

This study is a five year study with a 3 year retrospective and 2 year prospective component. Data of 200 patients were collected retrospectively and 100 patients were taken for 2 year prospective study. Due to covid 19 pandemic, this hospital was converted to covid dedicated hospital in western UP. Therefore, sample size was shortened to 300 patients. Data were collected from the patient by their clinical history, clinical examination with appropriate investigation on those patient who were admitted.

STATISTICAL ANALYSIS

Data were coded and recorded in MS Excel spreadsheet programme. SPSS v21 was used for data analysis. Descriptive statistics was elaborated in the form of median, mean and standard deviation for continuous variables, and frequencies and percentage for categorical variables. Group comparisons were made using independent sample t-test for continuously distributed data, and chi-squared test for categorical data. Level of significance was taken as $p < 0.05$.

RESULTS

This study is a cross sectional study of poly traumatic injuries during the period from July 2016 to June 2021 in Emergency department of SVBP hospital, Lala Lajpat Rai Memorial Medical college, Meerut primarily in Department of surgery along with other Departments. Due to COVID 19 Pandemic, sample size was reduced. Therefore, a total of 3000 patients were dealt with in the study.

Table 1: distribution of subjects according to age and sex

Age groups	Number of cases (%)
20 years or less	100 (3.3%)
21 – 30 years	640 (21.3%)
31 – 40 years	630 (21.0%)
41 – 50 years	650 (21.7%)
51 – 60 years	500 (16.7%)
61 – 70 years	330 (11.0%)
Above 70 years	150 (5.0%)

Sex of the patient	Number of cases (%)
Male	1900 (63.3%)
Female	1100 (36.7%)

The age group of cases included in this study ranged from 18 years to 88 years with mean age of 43 years and standard deviation of 15.62. majority of cases belonged among the age group of 41-50 years of age (21.7%) and majority of patients were male (63.3%) with a male: female ratio being approximately 2:1.

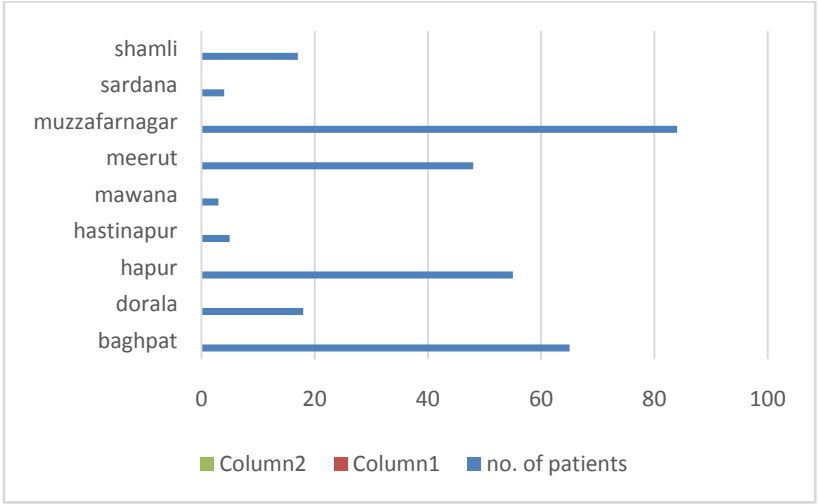

Fig 1: Distribution of cases according to residence of the patient. (N = 3000)

Our hospital drains a large population of western UP. The majority of population belonged to Muzzafar nagar (28%) presented in SVBP Emergency Department followed by District Baghpat (21.7%).

Table 2: distribution of subjects according to referral status and first aid taken

Referral status	Number of cases (%)
Referred	1960 (65.3%)
Direct case	1040 (34.7%)
First aid administered	Number of cases (%)
Present	2470 (82.3%)
Absent	530 (17.7%)

For all the cases presented to SVBP emergency, 65.3% cases were referred from some peripheral health centre. 34.7% cases were directly came to hospital. Out of 3000 patients included in study, 82.3% patients had taken some form of first aid before presenting to ED. While there were 17.7% patient who had not taken any form of first aid.

Table 3: Distribution of cases according to mechanism and site of injury

Mechanism of injury	Number of cases (%)
Trauma due to animal(AN)	150 (5.0%)
Trauma due to assault(AS)	720 (24.0%)
Fall from height(F)	180 (6.0%)
Firearm injury(FA)	340 (11.3%)
Road traffic accident(RTA)	1610 (53.6%)
Site of injury	Number of cases (%)
Head injury	2270 (75.7%)
Chest injury	90 (3.0%)
Abdominal injury(+ pelvic injury)	240 (8%)
Musculoskeletal	400 (13.3%)

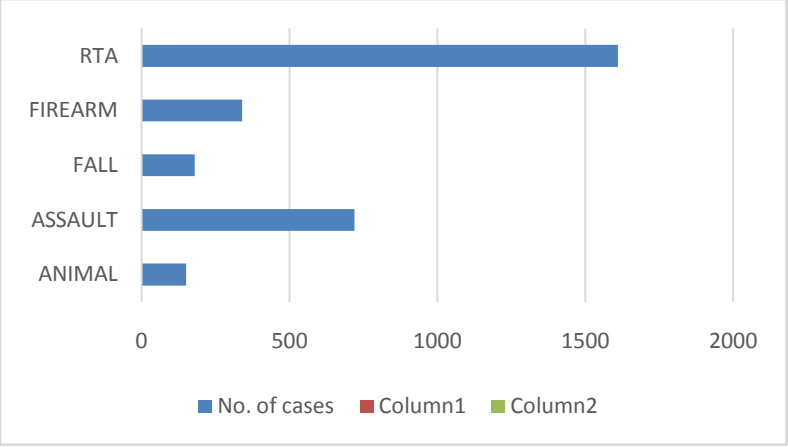

Fig: distribution according to mechanism of injury

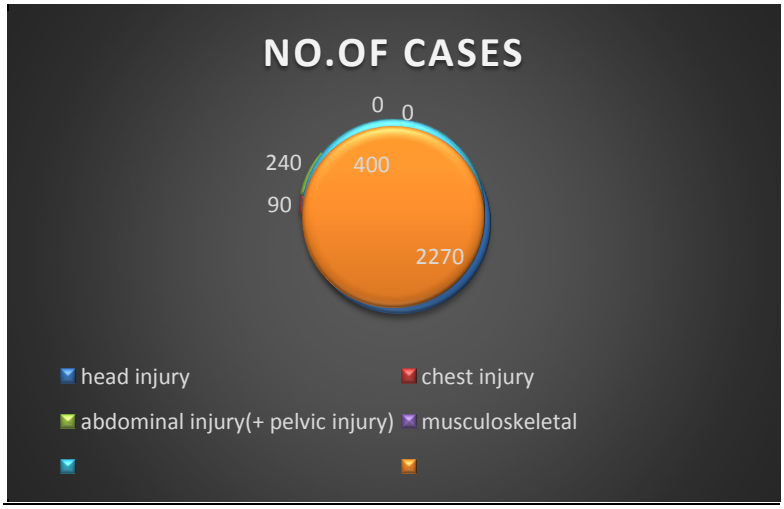

Fig: distribution according to site of injury

In this study, the major mechanism of trauma was found to be RTA (53.6%). Other major sort of injury was due to assault (24%). Remaining cases were trauma due to fall from height (6%), due to animal injury (5%) and due to firearm injury (11.3%). In our study, 75.7% cases were presented with head injury, 13.3% with musculoskeletal injuries which comprise of upper limb, lower limb and spinal injuries. Abdominal injuries were seen in 8% cases of which 8 cases were of pelvic trauma and 2 cases were of rectal trauma. Chest injury seen in 3% of cases.

Table 8: Distribution of cases according to outcome (N = 3000)

Outcome	Number of cases (%)
Recovered and performed daily activity	2070 (69.0%)
Recovered but bedridden	230 (7.7%)
Expired	260 (8.7%)
Absconded	150 (5.0%)
LAMA	290 (9.7%)

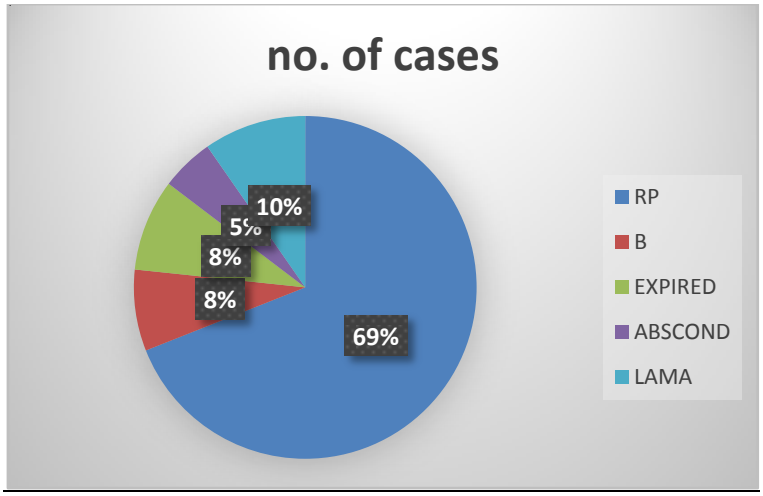

Fig 17: Distribution of cases according to outcome. (N = 3000)

Outcome of head trauma patients were calculated using glassgow outcome score (GOS). 69% cases were recovered and performed daily activity. 7.7% cases were recovered from trauma but bedridden. 8.7% patients were expired, 5% were absconded and 9.7% left hospital against medical advice.

DISCUSSION

This cross sectional study of 3000 cases of trauma patients was conducted in the Department of general surgery along with other Departments including Neurosurgery and Orthopedics during the period from july 2016 to june 2021 in SVBP Hospital attached to LLRM Medical College, Meerut. Following outcomes were drawn from our study.

The age of patients ranged from 18 years to 88 years which showed a maximum number of trauma in age group 41-50 years. Studies from various regions of the India have shown that majority of the victims belonged to 20-29 or 20-30 age group (2-3). Study conducted by **sharma rajni et al** at trauma centre and Super speciality Hospital, Institute of Medical Sciences BHU, Varanasi in 2018 showed maximum number of trauma patients belonged to age group 11-30 years. **Bodalal *et al.*** noted that the younger age group (20–29 years of age) formed the majority of RTA cases, while there was a trend toward an increasing average age of patients involved in an accident.

The incidence of Trauma were found more among male with 63.3% this findings was very much similar to study conducted in **2013 by Ruikar M.** National statistics of road traffic accidents in India with male consisting of 74.4-90 of accident victims, [4, 5] this is obvious to the fact that more males are usually outdoor for work compared to the females in India. Similarily study conducted **by sharma rajni et al** at trauma centre and Superspeciality Hospital, Institute of Medical Sciences BHU, Varanasi in 2018 showed Male was affected more with Trauma 67.40% with comparison to Female 32.60 %.

Few studies reported no significant difference in mortality when a trauma victim was directly admitted and referred groups. [6, 7 & 8] However, many authors have reported that immediate transfer (scoop and run) to a tertiary care center lowers mortality among major trauma patients [9, 10, 11, 12 & 13]. However, this will possible only by introducing awareness in bystanders and first responders, an effective pre hospital care, an organized system of triage, dedicated pool of ambulances services and fast easy transport like air evacuation (air ambulances).

RTA were found to be the major etiology of Trauma followed by Physical assault. Major mechanism of trauma was found to be RTA (63.7%). Other major sort of injury was due to assault (24%). Remaining cases were trauma due to fall from height (6%), due to animal injury (5%) and due to firearm injury (1.3%). The results of the study **by Saadat et al. [14], Rasouli [15], Chardoli et al. [16], Moini et al.** [17] were supporting the results of the present study. The results of the present study are somewhat similar and confirm the finding of others regarding head injuries and skeletal trauma published in the literature [18, 19, & 20]. Traumatic brain injury, especially diffuse axonal injuries, has poor outcome and has high mortality and morbidity.

In this study, 70.9% head injury patients was found to be fully recovered while 77.8% chest trauma patients were fully recovered. There has been seen 100% recovery in upper limb trauma patients. 59.5% lower limb trauma, 20% spinal trauma and 63.6% abdominal trauma patients was fully recovered. This association has been found to be statistically significant also.

80% of the spinal injury patients was found to be bedridden while no patient of the upper limb injury group was bedridden. 6.2% of head injury, 11.1% of chest injury 9.1% of abdominal injury and 3% of lower limb injury patients was found to be bedridden and this shows a statistically significant association with outcome of patients.

In India, many people are on roads at any given times and among them are pedestrians, bicyclists, and motorcyclists. Cars, scooters, and many heavy motor vehicles are also using the same roads, and the likelihood is higher for accidents to occur in these overcrowded and narrow roads. Results of our study confirm the findings noted by similar published data that have reported a high proportion of deaths on these overcrowding roads [21, 22, & 23].

The maximum length of stay was seen in bedridden patients with a mean of 11.17 days with a standard deviation of 8.03. The least length of stay was observed in patients who absconded with a mean of 4.20 days and standard deviation of 2.08 days.

Fully recovered patients had a mean of 5.54 days with a standard deviation of 3.55 days. A mean value of 5.81 days with a standard deviation of 4.44 was seen in expired patients and 4.66 days mean with standard deviation 1.67 days was seen in patients who went LAMA.

The length of hospital stay ranged from 1 day to 25 days. The maximum length of stay was seen in bedridden patients with a mean of 11.17 days with a standard deviation of 8.03. the least length of stay was observed in patients who absconded with a mean of 4.20 days and standard deviation of 2.08 days.

Fully recovered patients had a mean of 5.54 days with a standard deviation of 3.55 days. A mean value of 5.81 days with a standard deviation of 4.44 was seen in expired patients and 4.66 days mean with standard deviation 1.67 days was seen in patients who went LAMA.

CONCLUSION

The aim of the study was to improve the treatment and prevent trauma deaths by analysing the results of study. Although recently clinical treatment of trauma victim has improved, but for reduction of trauma burden requires good Government persuasions and well Instructional approach for prevention and definitive management.

According to this study, there is need for improvement in the referral services from peripheral health centres to tertiary care. In order to enhance the quality of treatment for severe RTA trauma patients, every PHC/CHC should be equipped to take care of these patients, at least initial resuscitation, is concerned.

The need for primary splintage for any extremity trauma, use of cervical collar, pelvic binder for suspected pelvic injury or hematuria should be promoted.

A dedicated ambulance service has been initiated by the Indian government at free of cost for rapid evacuation to the nearest hospital. There is a need for the development of ambulance service is also required to improve rapid transport.

Along with rapid transport, some trained medical personnel should accompany the patient during transport.

We also noted high prevalence of head trauma in our study. Which also enhance on the need of neurosurgeon in the emergency department and the basic neurosurgical procedure should be performed in ED only. So that early intervention can be taken and outcome of the trauma patient be improved. This will also reduce the number of LAMA and absconded patients.

Attention to identify and establish trauma care system/Accidental and Emergency department in the various provinces of the country is urgent. The results of this study and various similar studies can provide a suitable field for identifying target and provide a solution for policy makers in India.

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