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Original Research Article

Prevalence, Pattern and Outcome of Trauma Patients in North India: A Descriptive Study

Sharma Rajni[1*], Bhartiya SK[1], Gupta S[1] , Shukla VK[1], Mishra SP[2], Hakim M Z[2], Sharma S[2], Singh P[1*]

[1*]Trauma Nursing Coordinator, Trauma Centre and Superspeciality Hospital, Institute of Medical Sciences, BHU, India.
[1]Department of General Surgery, Trauma Centre and Superspeciality Hospital, Institute of Medical Sciences, BHU, India.
[2]Department of General Surgery, Trauma Centre and Superspeciality Hospital, Institute of Medical Sciences, BHU, India.

Corresponding Author: Sharma Rajni

ABSTRACT

The prospective study aims to evaluate the prevalence of Trauma its pattern, causes, management and outcome of Trauma victims admitted in Trauma centre, BHU, Varanasi.
On an average 70-80 Trauma patients were reporting to Emergency Department every day at Trauma centre BHU. In the study detailed history and examination of all patients were done like age, sex, injury type (blunt/ penetrating) and mechanism of injury, prehospital care. Apart from the injury patterns and Trauma scoring, causes and clinical condition were assessed at the time of arrival. Follow up of the in hospital Trauma cases and their definitive management had been assessed.
During the study period of six month (1 March 2018 to 31 August 2018) total 10200 patient reported to the Trauma Emergency Department , The incidence of Trauma were found more among male with 76.61% with male: female ratio 2:7, Adult with age group of 11-30yrs reported maximum injuries(43%) , Also only 61.47% of the Trauma cases has received Pre hospital care before arrival and 38.52% of the cases reported directly, 64.91% were stable 34.50% of the cases were unstable at the time of arrival and 0.588% of the patients were brought dead to ED. Road traffic accidents/Motor vehicle accidents (RTA/MVA) is found to be the major cause of Trauma followed by Falls, Miscellaneous (Machinery, others), Physical assault, Fire arms and Animal induced injuries. The Injury severity scoring (ISS) ranges from 1-15 is 57.09% followed by 24.08% (ISS16-24), 14.85% (ISS 25-49), 3.97%(ISS50-75)
Out of 10200 casualties only 3031 cases were admitted for definitive management out of which 30.88% of the cases were recovered and perform activity of daily living, 50.68% recovered but disabled,11.36% Expired, 4.77% of patients went DAMA (Discharge against medical advice) and 2.27% of the patients were absconded.
Key Words: Trauma, Motor Vehicle Accident (MVA)

INTRODUCTION

Approximately 5 million people lost their lives due to injury as per WHO estimates during the year 2002 (WHO 2004a). [1] The global injury mortality rate is estimated to be 98/100,000 population, with male and female rates of 128/100,000 (3.8 million deaths) and 67/100,000 (1.9 million deaths), respectively (WHO 1999). [2]

For instance, in India, in the year 2015 a total of 464,674 RTA were reported, leading to 482,389 injuries and 148,707 deaths [2]

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. Injuries caused 9% of the total mortality. Among the total disability-adjusted life-years (DALYs), 13% were due to injuries. The WHO–World Bank Report, which reviewed the disease transformation scenarios, indicates that RTIs will be the third leading cause of mortality by 2020, moving up from their present ninth position. Similarly, suicide and violence will move from the twelfth and sixteenth to tenth and fourteenth positions by 2020. [3] Among both children aged 5–14 years, and young people aged 15–29 years, road traffic injuries are the second-leading cause of death worldwide. [3]

In developed countries, the data were available from vital statistics registers and health care records. However, such records are of limited in developing countries.

India Loses approx 2-2.5% of its GDP to only Road Traffic Injuries. There is still lack of proper documentation and Trauma registry in India. [3]

Trauma centre and Superspeciality hospital BHU, Varanasi is largest Level1 Trauma centre in India with the bed capacity of 324 rendering Trauma care to Uttar Pradesh, Bihar and Jharkhand, Madhya Pradesh nearby country like Nepal. On an average per day 70-80 Trauma victim are reporting to Emergency Department every day.

A Trauma is a long-overlooked health problem deserves study. The study was conducted to understand and describe the incidence pattern, causes and mode of injury and outcome of the Trauma victim.

MATERIALS AND METHODS

Setting: The present study was conducted in Trauma centre and Superspeciality Hospital, Institute of Medical Sciences BHU, Varanasi.

Approach: An evaluative research approach is found to be most suitable for the attainment of the objectives of the prospective study.

We studied the 10200 trauma cases reported to emergency department over a period of six month (1 March 2018 to 31 August 2018). All injured patients of any age presenting to the Emergency department were included in the study. A pretested trauma profile form was filled at the time of arrival. Basic demographic characteristics, time and date, nature and cause of injury, vital signs, Trauma scoring outcome data were recorded. In case of road traffic injury type of vehicle and mode of collision was recorded, thorough clinical examination and necessary investigations were done, daily follow of up of all the in hospital cases were performed.

Tool:

Trauma profile is developed with the consultation of expert faculty from Trauma Surgery.

Tool Consist of two sections

Section A: Sociodemographic profile, Injury profile and Injury scoring and concerned references.

Section B: In Hospital follow up of Admitted patients

Ethical consideration:

The study was approved by the institute ethical committee and written informed consent was obtained from all the participants.

Methods to reduce willful misrepresentation

All the participants were assured that there information will be kept confidential and will not be shared for any other purpose

STATISTICAL ANALYSIS

Descriptive statistics has been used for this study purpose.

RESULT

Table-1: Distribution of the Trauma victim according to age:

VARIABLE		FREQUENCY(n)	PERCENTAGE
AGE	0-10	770	7.54%
	11-30	4386	43%
	31-50	3104	30.43%
	51-60	922	9.03%
	61 and above	1018	9.98%
SEX	MALE	7815	76.61%
	FEMALE	2385	23.38%

Most of the injuries were seen in 11-30 year age group (43%) followed by 31-50 (30.47%), 51-60 (9.91%), 61and above (9.04%). Male was affected more with Trauma 67.40% with comparison to Female 32.60 %. (Table -1)

TABLE 2: Distribution of the subjects according to the case type, referral and pre hospital

VARIABLE		FREQUENCY(n)	PERCENTAGE
CASE TYPE	REFFERD	6271	61.47%
	DIRECT	3929	38.52%
SOURCE OF REFFERAL- REGION WISE	VARANASI	3841	61.25%
	OUT SIDE OF VARANASI	2430	38.74%
SOURCE OF REFFERAL HOSPITAL	GOVERNMENT HOSPITAL	4551	72.57%
	OTHER HOSPITALS	1720	27.42%
PREHOSPITAL CARE RECIEVED	YES	6271	61.47%
	NO	3929	38.52%
MODE OF PATIENT TRANSPORTATION	AMBULANCE	8091	79.32%
	OTHER VEHICLES	2109	20.67%
TIME GAP BETWEEN TRAUMA & ARRIVAL TO HOSPITAL	< 3 HRS	810	7.94%
	3-6 HRS	1646	16.13%
	6-12HRS	3121	30.59%
	12-24HRS	4102	40.21%
	24 -48 HRS	521	5.10%

Majority of the Trauma victims i.e. 61.47% were referred from different Public Hospitals for further management and only 38.52 % of patients are reporting directly to the Emergency Department, and 61.47% of the Trauma cases had received pre hospital care before arrival to Trauma Centre. 79.32% of the patients arrives by ambulance service (public Private) and only 20.67% are approaching via their own convince. 40.21% of patients arrives after 12-24 hrs of injury followed by 30.59% who arrivers after 6-12 hrs, 16.13% between 3-6 hrs after injury, and only 7.94% are reporting within 3 hrs after the injury which indicates a very less percentage of the patients are able to come within "golden hour" of Trauma(Table -2).

TABLE 3: Distribution of subjects according to Mechanism of Injury, Clinical condition and vital parameters:

VARIABLE			FREQUENCY(n)	PERCENTAGE
MECHANISM OF INJURY	RTA/ MVA		4598	54.24%
	PEDESTRIAN		2991	29.32%
	FALLS	FALL FROM TREE	110	9.166%
		FALL FROM STAIRS	261	2.55%
		FALL FROM ROOF	268	2.62%
		FALL FROM VEHICLE	427	4.18%
		FALL FROM BED	78	0.76%
		SELF FALL	91	0.89%
		FALL OF HEAVY OBJECT	114	1.1176
	FIREARM INJURY		71	0.69%
	ASSAULT		643	6.30%
	CAUSED BY ANIMAL		112	1.09%
	SPORTS INJURY		141	1.38%
	TRAIN ACCIDENT		88	0.86%
	MECHANICAL INJURY(THRESHER MACHINE)		168	1.64%
	THUNDER LIGHTNING		2	0.019%
	OTHERS		37	0.36%
TYPE OF INJURY	BLUNT		9111	89.32%
	PENTERATING		1089	10.67%
CLINICAL CONDITION	STABLE		6621	64.91%
	UNSTABLE		3519	34.50%
	BROUGHT DEAD IN ED		60	0.588%
GCS	3-8		587	5.25%
	9-12		4034	40.13%
	13-15		5519	54.42%
VITALS	**SYSTOLIC BLOOD PRESSURE**			
	<90mmHg		701	6.91%
	90-119mm Hg		8811	86.89%
	>120 mm Hg		628	6.19%
	PULSE			
	Bradycardia (<60/min)		735	7.24%
	Tachycardia (>100/ min)		2094	20.65%
	Normal		7311	72.10%

INJURY SEVERITY SCORE

ISS	ISS 1-15	5789	57.09%
	ISS16-24	2442	24.08%
	ISS 25-49	1506	14.85%
	ISS50-75	403	3.97%

Distribution of subjects according to Mechanism of Injury, Clinical condition and vital parameters reveals that with respect to mechanism of injury 74.40% of the patients had RTA/MVA followed by 12.107% from fall, 6.30% from physical assault, 1.1176% from fall of heavy object, 1.64% from mechanical injury, 1.38% from sports injury, 0.86% from train accident, 0.69% fire arm injury, 0.019% from thunder lightening and 0.36% are caused by other causes.

With regard to the mode of injury 89.32 % had blunt injury and 10.67% had penetrating injury, out of which 64.91% were clinically stable and 34.50% were clinically unstable at the time of arrival and 0.588% of patients were brought dead to ED.

With regard to the GCS 54.42% of the patients had GCS range between 13-15, 40.13% of the patients had GCS ranges from 9-12 and 5.25% of the patient reported GCS ranges between 3-8 on arrival.

With regard to arrival in ED initial vitals i.e. Systolic BP 86.89% reported with SBP ranges 90-119mm Hg, followed by 6.91% below 90 mmHg and 6.19% with SBP >120 mm Hg.

With regard to the pulse rate 72.10% of the patient came with normal pulse rate, 20.65% reported with Tachycardia (>100/ min) and 7.24% with Bradycardia (<60/min).

With regard to the ISS(Injury severity scoring) 57.09% reported with ISS range 1-15, followed by by 24.08% between ISS range 16-24, 14.85% with ISS range 25-49, and 3.97% with ISS range 50-75 (Table -3).

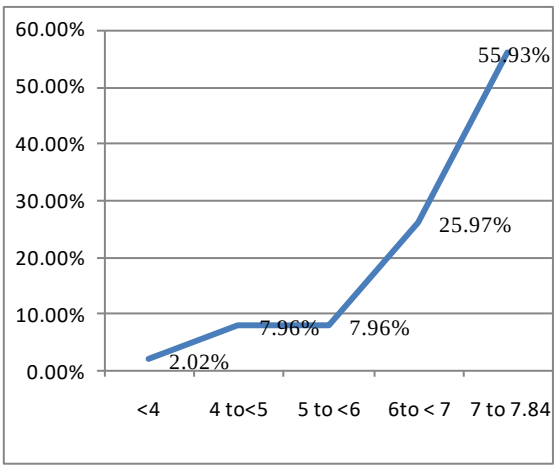

Figure-1: Distribution of the subjects as per RTS (Revised Trauma score)

Revised Trauma score (RTS) of majority of the trauma patients (55.93%) are between 7-7.84 followed by 25.97% (RTS 6to <7), 7.96 % (RTS 5 to< 6), 7.96 %(RTS 4 to<5) and 2.02% (RTS <4) (Figure -1)

TABLE 4: Distribution of subjects according to the concerned References in Emergency department

REFRENCES		**FREQUENCY(n)**	**PERCENTAGE**
DEPARTMENT	ORTHOPEDICS	3324	32.78%
	NEUROSURGERY	2215	21.84%
	PLASTIC SURGERY	240	2.36%
	OFMS	116	1.14%
	TRAUMA SURGERY	516	5.088%
	POLY TRAUMA (2 or more then Injuries)	3729	36.77%

Distribution of subjects according to the Departmental References in Emergency department 36.77% required polytrauma reference, 32.78% required orthopedics reference, 21.84% required neurosurgery reference, 5.088% required trauma surgery reference followed by 2.36% plastic surgery and 1.14% maxillofacial referral (table 4)

With regard to the length of stay in ED 64.42% of patients were released after primary intervention, 29.89% were admitted within 24 hrs in arrival to ED for definitive management, 2.77% left against medical advice, 1.89% were absconded and 1.015% died in ED(Red area) (Table -5).

Table 5: Distribution of subjects according to the length of stay in ED:

	STATUS	FREQUENCY(N)	PERCENTAGE
LENGTH OF STAY	DIED IN ED(RED AREA)	103	1.015%
	RELEASED	6533	64.42%
	ABSCONDED	192	1.89%
	LAMA	281	2.77%
	ADMITTED	3031	29.89%

TABLE 6: Distribution of subjects with respect to admission:

WARD/UNIT	Frequency(n)	Percentage
TRAUMA SURGERY	437	14.41%
NEURO SURGERY	1418	46.78%
ORTHOPEDICS	727	23.98%
PLASTIC SURGERY	185	6.10%
OFMS	247	8.14%
Pediatrics	17	0.56%

with respect to the distribution of subjects with respect to admission 46.78% were admitted under neurosurgery, 23.98% admitted under orthopedics, 14.41% admitted under Trauma surgery followed by 8.14% under OMFS, 6.10% under plastic surgery and 0.56% under Pediatrics (Table 6).

Table 7: Distribution of Admitted patient with regard to Outcome/Recovery:

	WARD/UNIT	FREQUENCY(n)	PERCENTAGE
PROGNOSIS/ OUTCOME	Recovered & Perform ADL(Activity of daily living)	936	30.88%
	Recovered but Disable/Bed ridden	1536	50.67%
	Expired	344	11.34%
	DAMA	144	4.75%
	Abscond	71	2.34%

Outcome of Admitted patients 50.67% were Recovered but Disable/Bed ridden, 30.88% were Recovered & Perform ADL (Activity of daily living), 11.34% expired, 4.75% were Discharge against medical advice and 2.34% were Abscond (Table7).

DISCUSSION

During the study period of six month (1 March 2018 to 31 August 2018) total 10200 patients reported to the Trauma Emergency Department. The incidence of Trauma were found more among male with 76.61% this findings was very much similar to several earlier studies 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.

Adult with age group of 11-30 reported maximum injuries (43%). Studies from various regions of the India have shown that majority of the victims belonged to 20-29 or 20-30 age group [(5-6)] Although the Trauma patients had received Pre hospital care before arrival in 61.47% and 38.52% of the patients reported directly, Recently due to our Central and regional Government efforts of the which provides the Emergency carrier to the shift the Trauma victims at proper centre and also there is increased awareness of the population like Good Samaritan.

In our Study 64.91% stable, unstable patients 34.50% and 0.588% of the patients were brought dead. MVA were found to be the major etiology of Trauma followed by fall, Miscellaneous (Machinery, others), Physical assault, Fire arms and Animal induced injury.

The results of the study by Saadat *et al.*, [7] Rasouli, [8] Chardoli *et al.*, [9] Moini *et al.* [10] were supporting the results of the present study.

The Injury severity scoring (ISS), ISS 1-15 was 57.09% followed by 24.08% (ISS16-24), 14.85 %(ISS 25-49), 3.97 % (ISS50-75).

Out of 10200 casualty, only 3031 cases were admitted for definitive management among which 30.88% of the cases were recovered and perform activity of daily living, 50.68% recovered but disable,11.36% Expired, 4.77% of cases went Discharge against medical advice (DAMA) and 2.27% of the cases were abscond.

CONCLUSION

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.

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.

Recommendations:

1. Considering that high proportion of RTI victims were young drivers, School road safety awareness programme should be periodically conducted to decrease high risk behaviors while driving.
2. Focus should be directed to make use of seat belts, helmet among youth.
3. Strengthening pre hospital care ambulance services.

Bringing in newer legislations strengthening of existing laws and also ensuring their proper implementation for drunken driving, mobile phone use while driving and nonuse of helmets and seatbelt is the need of the hour.

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Conflict of Interest: There is no conflict of interest.

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