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Research Article

EPIDEMIOLOGY OF TRAUMA PATIENTS ADMITTED IN EMERGENCY SURGICAL WARD WITH SPECIAL REFERENCE TO PROGNOSTICATE BY SERUM

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ABSTRACT

This study was aimed to find the Epidemiology of trauma patients admitted in emergency surgical ward with special reference to prognosticate by serum.
This was an observational study conducted on the patients admitted to trauma in emergency ward, Department of General Surgery, King George Medical University, Lucknow, India. A total of 604 patients with various HIs and polytrauma – burn, assault was studied in detail on a predesigned proforma, and follow up data were also recorded.
Age is the most consistent variable defining differences in head injury rates, with highest incidence in 21-30 years. Male patients are significantly higher than female patients.Mortality was higher in rural population as compared to urban population.Private vehicles are used in majority of cases to bring the patients to trauma centre and mostly from rural areas. The serum LDS levels correlated with both the severity of head injury as judged by Glasgow Coma Scale as well as the prognosis of the patient. Serum LDH levels were found to be higher in non survivors than survivors among all three groups of patients based on their GCS Scale and the difference was found to be statistically significant ($p<0.05$). Serum LDH levels were in inverse proportion to the total GCS scale ($p>0.05$). Serum LDH provides an excellent objective parameter to judge the severity of head injury. Although it cannot replace the excellent clinical GCS scale it still serves to provide additional information along with GCS scale especially in patients in whom GCS is rapidly fluctuating or sedated patients in which GCS cannot be assessed.

INTRODUCTION

Trauma injury accounts for 9% of global mortality and are a significant health problem worldwide. Trauma is the fourth main cause of death in India and accounts for 10.1% of all death, it is one of the leading cause of disability [13]. As per world health report (2004), it is predicted to be the third leading cause of mortality in the country, by 2020. For every mortality, it is estimated that there are multiple hospitalizations, emergency department visits, and doctors' appointments [1]. Injuries sustained are predominantly due to high energy blunt trauma such as a fall from height, road or workplace trauma [2]. Patients with multiple injuries are widespread, increasing the complexity of trauma care and treatment. Better understanding of the nature of trauma risk and outcome could lead to more effective prevention and treatment strategies.

Although have also been made predict the outcome of trauma patients at the time of admission. Various trauma scores and pathological tests have been done to prognostic the outcome but their definite role yet to be established. Services levels, pyruvate a lactate are good predictors for mortality and development of septic complications in recently injured patients. These may prove to be affective parameters in the management of the patient with injury.
This study aimed to:

1. Widely evaluate the epidemiologic characteristics of trauma
2. Examine the relationship between serum parameters and outcome of trauma patients.

MATERIALS AND METHODS

This was an observational study conducted on the patients admitted to trauma in emergency ward, Department of General

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Surgery, King George Medical University, Lucknow, India. A total of 604 patients with various HIs and polytrauma – burn, assault was studied in detail on a predesigned proforma, and follow up data were also recorded.

As detailed in the Census of India 2011, the population of Lucknow was 4,588,455, of which male and female were 2,407,897 and 2,180,558 respectively. The total area of the Lucknow district is about 2,528 km^2. A high percentage of the total population (36.37%) resides in rural areas which mean that around 63.3 percent are urban in nature (11-12).

Severity and outcome factors

As far defining severity, most country use the Glasgow coma scale (GCS) the score can range from 3 to 15 and a convention has emerged that patient with coma score 8 or less are as severe and these with score 13 or more mild and moderate.

Data analysis

After data collection, data were entered in Visual FoxPro 6.0 database management software. Care was taken for any miss-entry and data redundancy. Primary data analysis was done to check and clean the data. Data were analysed using statistical software package, STATA 6.0 and EPI 6. A difference between the two values was considered to be significant only if 'p' value was found to be <0.05 otherwise the exact p-value was mentioned.

RESULTS

In the present study, 786 patients attending Emergency Surgical Ward with suspected Head Injury (HI), Burn, Assault, Firearm injury and other injuries as the medical notation from casualty room were surveyed. Out of them, 182 patients diagnosed with HI was either excluded or they were sent home after a period of observation. Therefore, a total of 604 patients with various HIs and polytrauma – burn, assault was studied in detail on a predesigned proforma, and follow up data for remaining 604 patients were also recorded.

It is found that age is the most consistent variable defining differences in head injury rates, with highest incidence in 21-30 years followed by 31-40 years. Male patients are significantly higher than female patients. Male are 84.44% and females are 15.56%. In the female patients 21-30 is most common age group (36.7%) followed by 41-50 age group (23.40%) **(Table 1).**

Table 1 Age and Sex-wise distribution of patients

Age Group	Male		Female		Total	
(Years)	No.	Percentage	No.	Percentage	No.	Percentage
0-10	68	13.33	6	6.38	74	12.25
11-20	74	14.51	4	4.26	78	12.91
21-30	122	23.92	34	36.17	156	25.83
31-40	104	20.39	18	19.15	122	20.20
41-50	68	13.33	22	23.40	90	14.90
51-60	38	7.45	8	8.51	46	7.62
>60	36	7.06	2	2.13	38	6.29

Mortality was higher in rural population (14.40%) as compared to urban population (10.19%)

In the present study, Road Traffic Accidents (RTAs), fall from height, assault and fall of objects over the head contributed for 50%, 33.3%, 8.0% and 4% respectively. Majority (59.27%) of His and other injuries occurred by the road side. Surprisingly the 'safe' environment of home ranked second with 36.4% of cases. HI occurring on city roads and national highway accounted for 57.6% of deaths, followed by 29.8 deaths, when patient was injured at home (out of total deaths = 104).

Table 2 Mode of Transport to CSMMU

Mode of Transport	Number	Percentage
Ambulance	184	30.46
Private vehicle	370	61.26
Public vehicle	12	1.99

Ambulance is used in 30.46% patients, private vehicle is used in 61.26% patients, public vehicle is used in 1.99% patients and other means were used in 6.29% patients (**Table 2**).

Table 3 Time Gap between Trauma and First Rescue

Time Gap	Number	Percentage
Immediate	38	6.29
<30 minutes	146	24.17
30 minutes – 60 minutes	328	8.61
1 hour – 6 hours	52	8.61
>6 hours	40	6.62

6.29% patients get immediate treatment, 24.17% patients get treatment <30 minutes, 54.30% get treatment within 30 minutes to 60 minutes **(Table 3).**

Table 4 Time Gap between Trauma and Third rescue

Time Gap	Number	Percentage
Immediate	14	2.32
<30 minutes	36	5.96
1 hour – 3 hours	336	55.63
3 hours – 6 hours	32	5.29
6 hours – 24 hours	148	24.50
>24 hours	38	6.29

55.63% patients get treatment between 1-3 hours, 24.50% patients get treatment between 6-24 hours, 6.29% patients get treatment in >24 hours **(Table 4).**

Table 5 System Involved

System Involved	Number	Percentage
1. Head injury + Other	436	72.19
2. Maxillofacial + Other	48	7.95
3. Burn	30	4.97
4. Thorax + Other	42	6.95
5. Limb	34	5.63
6. Abdomen	8	1.32
7. Other	6	0.99

In 72.19% patients head and other organs were involved, in 7.95% patient's maxillofacial region and other injuries were involved, in 4.9% burn was the cause of trauma, in 6.95% thorax and other organs involved, in 5.63% patients only limbs were involved and in 1.32% patient's abdomen was involved and other systems were involved in 0.99% **(Table 5).**

Table 6 Comparison of LDH level (U/L) in different severity group of GCS (n=102)

	Mild (13-15)	Moderate (9-12)	Severe (3-8)	Control
Number	56	29	17	30
Mean LDH level	180.98	432.53	825.42	106.40
SD	30.46	25.24	80.42	20.84
	't'	'p'		't'
Control Vs. Mild	11.98	<0.001	Control Vs. Mild	11.98
Control Vs. Moderate	54.20	<0.001	Control Vs. Moderate	54.20

LDH level of cases with different severity of GCS is significantly higher than control subjects **(Table 6).**

Table 7 Comparison of LDH level in survivors and expired patients in severity group of GCS

GCS	Survivors		Expired		T	P
	N	Mean±SD	N	Mean±SD		
Mild (n=56)	54	179.620±25.64	2	219.40±30.42	2.15	P<0.05
Moderate (n=29)	23	423.63±30.62	6	466.64±32.46	3.03	P<0.01
Severe (n=17)	3	729.75±60.16	14	845.92±75.15	7.96	p<0.001

LDH levels is significantly higher in expired patients as compared to survived patients in different severity group of GCS **(Table 7**).

Table 8 Comparison of LDH level in survived patients in different group of GCS

GCS	't'	'p'
Mild Vs. Moderate	36.04	P<0.001
Mild Vs. Severe	33.53	P<0.001
Moderate vs. Severe	14.64	P<0.001

LDH is maximum in severe than in moderate and minimum in mild group and difference is significant (**Table 8**).

Table 9 Comparison of LDH level in expired patients in different group of GCS

GCS	't'	'p'
Mild Vs. Moderate	9.42	P<0.01
Mild Vs. Severe	11.37	P<0.01
Moderate Vs. Severe	11.30	P<0.01

LDH level is maximum in severe group than in moderate group and minimum in mild group difference (**Table 9).**

DISCUSSION

In the present study, 604 patients with various HIs and polytrauma – burn, assault were studied. Age is the most consistent variable defining differences in head injury rates, with highest incidence in 21-30 years. Male patients are significantly higher than female patients. As shown by other studies highest number of head injuries occurred in the younger age group and in males similar to this study (5-6).

Mortality was higher in rural population as compared to urban population. Similarly, rural populations exhibit disproportionately high injury mortality rates. Patients who die in a rural area without a formal trauma system are more likely to die at the scene, are less severely injured. The higher proportion of scene deaths in the rural environment may reflect the longer discovery and transport times that occur in a rural setting (7-8). In the present study, Road Traffic Accidents (RTAs), is the major cause for HI similar to other study (9-10). Severe head injury is associated with high mortality and morbidity. HI occurring on city roads and national highway. Private vehicles are used in majority of cases to bring the patients to trauma centre and mostly from rural areas.Development of trauma services is a challenge in rural areas. The number and distribution of these facilities are not proportionate to the injured patient. Only, 6.29% patients get immediate treatment.Timely arrival in hospital helps in providing prompt management and good outcome. Mock *et al*., concluded in their study that good outcome is seen, if a victim of trauma receives proper lifesaving care within a few minutes of injury [14].

As seen in our study the serum LDS levels correlated with both the severity of head injury as judged by Glasgow Coma Scale as well as the prognosis of the patient. Serum LDH levels were found to be higher in non survivors than survivors among all three groups of patients based on their GCS Scale and the difference was found to be statistically significant ($p<0.05$). Serum LDH levels were in inverse proportion to the total GCS scale ($p>0.05$).

Thus serum LDH provides an excellent objective parameter to judge the severity of head injury. Although it cannot replace the excellent clinical GCS scale it still serves to provide additional information along with GCS scale especially in patients in whom GCS is rapidly fluctuating or sedated patients in which GCS cannot be assessed.

CONCLUSION

The present study was hospital based descriptive study conducted in the Accidental & Emergency Unit of Surgery Department. Epidemiological features of head injury (HI) and other injuries, including demographic characteristics like age, sex, casualty, intention of trauma and variables like type of vehicle involved, fall from height, burn, firearm injury etc. were taken into consideration. Serum LDH provides an excellent objective parameter to judge the severity of head injury. Although it cannot replace the excellent clinical GCS scale it still serves to provide additional information along with GCS scale especially in patients in whom GCS is rapidly fluctuating or sedated patients in which GCS cannot be assessed.

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