



Prevalence of Trauma Cases in a Tertiary Care Teaching Hospital

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ABSTRACT

Trauma is a global problem and the leading cause of death in low and middle-income countries like India. The trauma registry is considered to be a vital component of a trauma system; there is good evidence that organised trauma care systems decrease deaths. Few trauma registries exist in India. Trauma scoring systems are routinely used in conjunction with trauma registries, as a measure of injury severity and as a predictor of mortality. The prevalence rate of trauma cases was evaluated in this study. The aim of the study was to develop a template for a trauma registry, define the epidemiology of trauma and define clinically measurable risk factors for mortality in a tertiary care teaching hospital. Data was collected on injured patients 24 hours/day including: circumstances of trauma, transport method and time, injury type and location, vital signs on arrival and disposition from the registry of Orthopaedic department, IMS and SUM hospital, Bhubaneswar, Odisha, India. Data was analysed using SPSS 20 software. In 5 years, there were 25591 trauma cases reported. Males predominated over the females with 14889 males and 10702 females. Among them 3213 were married and 3721 were unmarried. It was found that maximum trauma cases were due to road traffic accidents i.e. 18903. A total of 20590 patients were benefited after being treated in this hospital. Though 2601 cases could not be followed up. Because of increasing degree of severity of injury seen in road traffic accidents, a total number of 105 unviable limbs had to be amputated in order to save the life of the patient. The epidemiology of trauma for injured patients presenting increases day by day. A surprise finding was the high number of falls. Public health education priorities and the need for a trauma care system, including pre-hospital care and a reorganisation of trauma care within the hospital were identified. The hospital would benefit from a trauma registry system.

Keywords: Trauma registry; management of trauma; amputation; Prevalence.

INTRODUCTION

Trauma is a major cause of death and social problem.¹ In low and middle income countries, which make up 85% of the world, 11% of all disability-adjusted life years are due to trauma.² In these countries, trauma-related mortality before 60 years of age is more frequent than in high income countries, and the life expectancy projections are very low.^{3,4} For these reasons, major attention is given for improving treatment of trauma patients, preventing trauma itself, and developing various emergency medical services to reduce preventable trauma death. Particularly, understanding the epidemiology of trauma helps to analyze risk factors, to develop treatment strategy, to reduce disability, to prevent mortality, and to construct a precise intervention system. However, the lack of trauma epidemiology data limits the growth of these trauma management systems.^{5,6}

Globally, trauma is one of the major causes of death and is especially prominent at a young age.^{7,8} The first research on death by trauma is a paper written by Baker⁹ in 1980 on the epidemiology of death by trauma in San Francisco. According to the results presented in more recent papers, an annual 5.8 million deaths are caused by trauma, and in 2020, this figure is expected to rise up to

8.4 million deaths annually.¹⁰ When looking at WHO data from 2007, deaths caused by trauma constitute 9% of total annual deaths.¹¹⁻¹³ The purpose of this study is to examine the epidemiology of trauma within a local community in Eastern India through data gained from our tertiary health care setup.

MATERIALS AND METHODS

A retrospective study was conducted for 5 years to know the prevalence of trauma cases in a tertiary care hospital.

All the data were collected from the registers of Orthopaedic department of IMS and SUM Hospital, Bhubaneswar. And the data were analysed with the help of SPSS 20 software.

RESULTS

With a retrospective study for 5 years, it was found that a total of 25591 patients were enrolled as trauma cases in a tertiary care hospital.

Among them maximum cases were treated in OPD and complicated cases were treated in IPD. In IPD, maximum cases were treated with major surgery (Table 1).

The people of urban areas are more affected as compared to rural areas in the demographic study of



trauma patients. Unmarried and males predominated with marital status and gender respectively (Table 2).

With questionnaire, 2941 patients were addicted to drugs whereas more patients were non-addicted.

In aetiology point of view, maximum patients were road traffic accident victims and fewer patients were due to fall from height (Table 3).

Maximum patients were cured from OPD whereas complicated cases were treated in IPD (Table 4).

In severe unsalvageable conditions the patients were planned for life saving amputation (Table 5).

DISCUSSION

In considering other studies, motor vehicle accidents and injuries from falling seem to occur more often with men than with women, as stated by WHO³ and Moshiro.¹⁴

Such can be inferred by the more prominent social activities of men in comparison to those of women, and as a result, men are more prone to vehicle and work related accidents. It can be presumed that trauma under the age of 18 is dominated by the carelessness of children, whereas trauma between the ages of 19 to 60 is dominated by an increasing number of motor vehicle accidents or work related accidents.

It can also be inferred that the increasing trauma after the age of 61 is due to the weakening of the body and lack of attentiveness. The distribution of trauma according to age shown in this study is similar with that of other studies.^{15,16}

Of the total number of patients who visited the emergency centre, 64.2% of patients were discharged by the emergency physician after primary treatment.

This phenomenon may be attributable to the well-developed tertiary health care facility, which allows for visits to easily accessible emergency centres at a relatively low cost.¹⁷

Although some trauma patients required hospitalization at the emergency centre, 10.2% of these patients opted to transfer, as they lived in different region or wanted to move to more renowned hospital.

Such cases are due to the distinct features of the region in which our hospital is located, given the surrounding area is ideal for holiday trips and leisure activities; there are also few general hospitals and university-affiliated hospitals in the state.

Therefore, when accidents occur, regardless of where the patients originally came from, the primary care is carried out by our emergency centre.

Furthermore, there is an unusual behaviour common to many Indians to tend to transfer to famous general hospitals in the metropolitan region.

Most of the trauma mechanisms in our data were classified as road traffic accidents, domestic fall and fall from height.

Slip-and-fall-down injuries and vehicle associated injuries tend to be dominant, as stated by Bulut,¹⁸ and Lallier.¹⁹

Motor vehicle accidents are among the highest leading causes of death and disability, and are a major cause of trauma in public health.

Drunk driving, drowsy driving, and careless driving are several examples of the causes of motor vehicle accidents, and all of them are prominent in young men and women in general.^{20,21}

Slip-and-fall-down injuries are also among the highest leading causes of blunt trauma; these types of injuries are caused by carelessness or suicidal intentions.^{22,23}

The injury mechanisms mentioned above are health problems that can definitely be prevented by safety education, by promoting a safe environment and continuing health education.

Tan²⁴ revealed that increasing age was a risk factor for mortality after trauma, and Agalar²⁵ states that trauma mortality has significant relations with age.

Most life-threatening patients were transported to our emergency centre directly; however, some vital-stable patients were transported to our emergency centre from other local hospitals after physical examinations, laboratory tests, and image studies.

Although some critical patients were originally taken to local hospitals, after image or laboratory studies, they were transported to our emergency centre for further definitive treatment. This delay in arrival is the result of a lack of education in patient triage when at an accident location. Continuous education of proper transportation for emergency transport systems will shorten this delay.

The authors intend to improve treatment and prevent of trauma death by analyzing the results of treatments and causes of trauma-related deaths. In order to enhance the quality of treatment for severe trauma patients, regional trauma centres need to be established our health care centre. However, in addition to the need for the development of such trauma centres, software is also required to improve rapid transport, rapid sequence management, effective trauma team approaches (involving anaesthetists, general surgeons, cardiovascular surgeons, neurosurgeons and orthopaedic surgeons), and constant education. Additionally, a shared trauma registry system for epidemiology is required, which will improve the quality of trauma centres; however, the data collection must be standardized, valid, and reliable.

One of the limitations of this study is that the study was not carried out in multiple centres but was limited to one regional emergency centre for 5 years; thus, the sample and term were somewhat limited.



One final limit is the fact that deaths outside of the emergency centre and discharge against advice have not been accounted for in this study.

Table 1: Number of trauma cases attending hospital

Year	Total patients	OPD	IPD	Surgery		
				Major	Minor	Total
2011	2978	2270	708	395	206	601
2012	4066	3255	811	411	281	692
2013	5512	4577	935	588	235	823
2014	6101	4886	1215	694	472	1166
2015	6934	5557	1377	845	423	1268
Total	25591	20545	5046	2933	1617	4550
Mean	5118.2	4109	1009.2	586.6	323.4	910
SD	1589.47	1325.77	279.79	190.95	117.68	293.37

Table 2: Demographic data of trauma patients attending hospital

Year	Locality		Gender		Marital status		Age		
	Rural	Urban	Male	Female	Married	Unmarried	Adolescent	Young	Elderly
2011	1633	1345	1632	1346	1360	1618	362	1723	893
2012	2634	1432	2352	1714	1853	2213	412	2638	1016
2013	2595	2917	3185	2327	2410	3102	722	2805	1985
2014	2928	3173	3724	2377	2709	3392	1115	3034	1952
2015	3122	3812	3996	2938	3213	3721	1634	3412	1888
Total	12912	12679	14889	10702	11545	14046	4245	13612	7734
Mean	2582.4	2535.8	2977.8	2140.4	2309	2809.2	849	2722.4	1546.8
SD	573.3213	1097.315	979.7041	620.4541	723.8705	870.514	531.8007	629.5612	543.5593

Table 3: Behavioral pattern of the trauma patients attending hospital

Year	Drug habited		Stress factors		Cause of trauma		
	Addicted	Non-addicted	Stressed	Non-stressed	RTA	Fall from height	Domestic fall
2011	208	2770	1148	1830	2016	126	836
2012	325	3741	1266	2800	2928	155	983
2013	661	4851	2676	2836	4019	212	1281
2014	915	5186	2789	3312	4832	255	914
2015	832	6102	3616	3318	5108	288	1538
Total	2941	22650	11495	14096	18903	1036	5552
Mean	588.2	4530	2299	2819.2	3780.6	207.2	1110.4
SD	310.388	1296.6	1061.674	606.387	1300.481	67.36987	292.4232

Table 4: Output of trauma patients after complete treatment in hospital

Year	OPD			IPD		
	Benefited	Not benefited	Lost to follow up	Benefited	Not benefited	Lost to follow up
2011	1622	219	429	575	45	88
2012	2615	334	306	602	99	110
2013	3826	361	390	771	104	60
2014	3955	419	512	1022	126	67
2015	4412	561	584	1190	132	55
Total	16430	1894	2221	4160	506	380
Mean	3286	378.8	444.2	832	101.2	76
SD	1143.041	125.1727	107.7135	267.8311	34.40494	22.79254



Table 5: Number of amputation cases after trauma

Year	Upper limb			Lower limb		
	hand	forearm	arm	foot	leg	thigh
2011	6	2	2	4	12	3
2012	5	1	0	4	11	1
2013	3	3	1	2	10	1
2014	2	1	0	3	8	2
2015	2	2	1	5	6	2
Total	18	9	4	18	47	9
mean	3.6	1.8	0.8	3.6	9.4	1.8
SD	1.81659	0.83666	0.83666	1.140175	2.408319	0.83666

CONCLUSION

Our results show that injuries of trauma patients are caused mainly by road traffic accidents, domestic fall and fall from height.

Major injury sites were on the extremities of most trauma patients.

Rapid transport, rapid sequence management, effective trauma team approaches, constant education, and a standardized trauma registry may decrease trauma-related deaths.

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