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Original Research Article

Epidemiology of Fatal Injuries reported in the mortuary of a tertiary care hospital

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ABSTRACT

Background: Injuries are an increasingly recognized global, preventable public health problem and are an important cause of mortality and morbidity in adult population. The major causes of injury related deaths may be intentional and unintentional. The major unintentional or "accidental" causes are road traffic accidents (RTAs), falls and drowning whereas the leading intentional causes are suicide and homicide. A robust Surveillance System for Injury Mortality is almost non-existent in our country due to which the data for the same is not available and haphazard. Keeping these factors in mind, the following study was under taken to identify the various epidemiological factors related to fatal injury cases.
Methods: A record based retrospective study was conducted in the Department of Community Medicine, VSSIMAR, Burla, Odisha. The data were collected from the autopsy reports preserved at the Dept of FM & T, VSSIMSAR. Variables like age, sex, number of injury cause of death, place of death etc. were collected. Data were entered in Microsoft Excel and analysed using proportions and percentages.
Results: The age group 25-44 years recorded the maximum number of deaths (37.49%). Males suffered the highest casualty accounting for 61.85% of deaths. Unintentional fatal injuries constituted 63.58% of deaths. The most number of fatal injuries resulting in deaths were RTAs (36.41%).
Conclusions: The age group 25-44 years recorded maximum deaths. Males were the major death victims. RTAs constituted maximum of deaths among unintentional fatal injuries. Homicidal injuries constituted maximum of deaths due to intentional fatal injuries.

Keywords: Fatal injuries, Epidemiology, Tertiary care hospital

INTRODUCTION

Injuries are an increasingly recognized global, preventable public health problem and are an important cause of mortality and morbidity in adult population. An injury is "the physical damage that results when a human body is suddenly subjected to energy in amounts that exceed the threshold of physiological tolerance – or else the result of a lack of one or more vital elements, such as oxygen".[1] Injuries affect every population and geographic region.[2] Any injury resulting in death of the individual is fatal injury. The leading cause of death in both sexes and in all age groups is injuries.[3] Injuries amount to 9% of the total world's death and 27% of deaths in the age group 5-14 years.[1] In age group 45 years and over, self harm is the leading cause of fatal injury.[3]

Millions of people who suffer injuries may require treatment not involving formal medical care, visits to the local area hospitals, emergency department or

hospitalization. Thus deaths occurring globally due to injuries represents only a small fraction of those injured. The shape of this "Injury Pyramid" is determined by severity of injury, access to health care services, quality of data availability etc which varies country wise.[4]

The injury-related mortality rate in low- and middle-income countries is almost double the rate found in high-income countries.[5] Low income and middle income countries are the major contributors to the 5.1 million global injury related deaths.[1] Standardized rate of disability adjusted life years (DALYs) in low- and middle-income countries was more than triple than that in high-income countries.[5]

But it is these countries which need to be able to measure the scale of the problems. A surveillance system for injuries in these countries is almost non-existent. So the quantification of fatal injuries is always a tough task. There are very few studies in developing countries studying the burden of fatal injuries where the burden of injuries is the heaviest.[3] In developed countries, if one person is killed by injury, the rate of hospitalization, treatment at emergency rooms is 30 and 300 times of that killed with many more receiving undocumented treatment. But the data for the injury in developing countries is almost not available. Death from fatal injuries results in loss of productivity with significant loss of economic opportunities.[3]

As per WHO, significant efforts are needed in the coming years failing which road traffic accidents, suicides and homicides will rise from the ninth, sixteenth and twenty second position (2004) in the list of leading causes of death to fifth, twelfth and sixteenth position (2030).[1]

The major causes of injury related deaths may be intentional and unintentional. The major unintentional or "accidental" causes are Road traffic accidents, falls and drowning whereas the leading intentional causes are suicide and homicide.[1] The proportion of world injury mortality by mechanism of injury is lead by road traffic accidents (24%), suicides (15%), and falls and homicides (10%).[1] The burden of unintentional injuries is 86.6% of all types of injuries.[6]

A robust surveillance system for injury mortality is almost non-existent in our country due to which the data for the same is not available and haphazard. Keeping these factors in mind, the following study was under taken. The key question of *what is the epidemiology of fatal injuries reported in the mortuary of a tertiary care hospital?* needs to be answered..

METHODS

A record based retrospective study was conducted in the Department of Community Medicine, VSSIMAR, Burla, Odisha for a period of seven months from 1st June 2016 to 31 January 2017. Any hurt or harm or casualty resulting in death of the injured person was taken as Fatal injury. The data was collected from the autopsy reports preserved at the Dept. of FM & T, VSSIMSAR using the WHO "Fatal injury surveillance data collection form". All Autopsy reports with fatal injuries as cause of death, from January 2005 to December 2012, were examined and used for data collection. Only those reports which were well preserved were used and reports with partial or poor preservation were excluded. Variables like age, sex, number of injury deaths per month, cause of death, place of injury, place of death etc. were collected.

Data was entered in Microsoft Excel and analysed using proportions and percentages.

RESULTS

A total of 5849 autopsy reports of fatal injuries resulting in death were received from the Department of Forensic Medicine & Toxicology, VSSIMSAR, Burla, the details of which are as follows.

Table 1: Month wise mortality due to injuries.

Month	Month wise mortality	
	No	Percentage (%)
January	509	8.7
February	470	8.03
March	447	7.64
April	514	8.78
May	612	10.46
June	523	8.93
July	545	9.31
August	426	7.28
September	363	6.2
October	449	8.7
November	415	7.67
December	576	9.84
Total	5849	100

Table 1 shows total number of deaths due to injuries per month for the study period. The total deaths due to fatal injuries were 5849. The highest deaths were observed in the month of May (612, 10.46%) and the lowest in September (363, 6.2%).

Table 2 shows number of deaths due to injuries by age, sex, and intent. The age group 25-44 years recorded the maximum number of deaths (2193, 37.49%) and the lowest deaths were recorded in the age group ≤14 yrs (401, 6.85%). Males suffered the highest casualty accounting for 3618 (61.85%) deaths. Unintentional fatal injuries constituted 3719 (63.58%) deaths out of the total 5849 deaths with undetermined fatal injuries being only 527 (9.01%) deaths. Homicidal injuries (1053) constituted 65.64% of deaths due to intentional fatal injuries (1603).

Table 2: Number of injury deaths due to age, sex, and intent.

Intent	≤14 yrs		15-24 yrs		25-44 yrs		45-64 yrs		≥ 65 yrs		All ages		
	M	F	M	F	M	F	M	F	M	F	M	F	Total
Unintentional	220	99	727	344	812	427	298	508	156	128	2213	1506	3719
Suicide	2	1	39	28	158	89	161	45	21	6	381	169	550
Homicide	30	38	159	101	361	147	117	61	24	20	691	362	1053
Undetermined	8	8	43	58	129	70	121	43	32	15	333	194	527
Total	260	141	968	531	1460	733	697	657	233	169	3618	2231	5849

Table 3: Number of injury deaths by place of death and intent.

Place of death	Unintentional	Suicide	Homicide	Undetermined	Total
At the spot of injury	1269	244	656	165	2334
At home	52	161	56	45	314
Ambulance	128	23	9	17	177
Health facility	2254	79	326	198	2857
Others	11	35	1	55	102
Unknown	5	8	5	47	65
Total	3719	550	1053	527	5849

Table 4: Number of injury deaths by mechanism of injury and intent.

Mechanism of injury	Unintentional	Suicide	Homicide	Undetermined	Total
Road traffic injury	1987	73	67	3	2130
Other transport injury	124	117	79	5	325
Blunt force	161	9	12	7	189
Fall	332	7	10	24	373
Stab/cut	10	71	63	2	146
Animal bite	79	2	0	40	121
Drowning	586	71	46	9	712
Burn	164	17	33	65	279
Poisoning	103	83	141	5	332
Asphyxia	60	89	590	5	744
Electrocution	109	0	9	4	122
Gun shot	3	11	2	0	16
Unknown	1	0	1	358	360
Total	3719	550	1053	527	5849

Table 5: Number of road traffic injury related deaths by type of road use, age and sex.

Road use	≤14 yrs		15-24 yrs		25-44 yrs		45-64 yrs		≥ 65 yrs		All ages		
	M	F	M	F	M	F	M	F	M	F	M	F	Total
Pedestrians	8	3	47	7	201	64	55	17	21	8	332	99	431
Drivers/Riders	1	0	195	6	373	27	145	19	15	0	729	52	781
Passengers	12	2	114	28	200	26	76	27	21	21	423	104	527
Others*	4	1	31	19	219	22	51	17	23	4	328	63	391
Total	25	6	387	60	993	139	327	80	80	33	1812	318	2130

Table 3 shows number of injury deaths by place of death and intent. Most of the Unintentional injury deaths were at the health facilities (60.60%). Most of the suicidal (44.36%) and homicidal deaths (62.29%) occurred at the spot. Most of the undetermined deaths were at the health facilities (37.57%).

As per table 4, 1987 (53.42%) deaths were due to road traffic accidents in the category of Unintentional intent. Asphyxia (590, 56.03%) was the main cause of death in homicides.

The most number of fatal injuries resulting in deaths were from road traffic accidents (2130, 36.41%) followed by asphyxia (744, 12.72%). There were around 360 cases (6.15%) of death without any known mechanism of injury. Gunshot injuries resulted in the least number of deaths (16, 0.27%).

As per table 5, out of total 2130 deaths due to road traffic accidents, 1812 (85.07%) deaths were of males. The most deaths were of drivers/riders (781, 36.66%) followed by 527 (24.74%) deaths of passengers. The least number of deaths were in the age group of ≤14 yrs (31, 1.45%) and the highest number of deaths had occurred in the age group of 25-44 yrs (1132, 53.14%).

DISCUSSION

In our study most number of fatal injuries resulting in deaths were from road traffic accidents (36.41%) which is very similar to study conducted by Jason London et al in Ghana in which 34% fatal injuries were due to motor vehicle crash.[7] The same study finds 68.7% of the victims to be males similar to our study in which males suffered the highest casualty accounting for 61.85% of total fatal injuries. In our study 85.07% of the total 2130 RTA death victims were males compared to 75% in a study conducted by Kual et al on fatal road traffic accidents at the mortuary of SRN Hospital, MLN Medical College, Allahabad.[8] The same study had similar findings of highest percentage (33.68%) of deaths among 25-44 years age group compared to our study in which highest 53.14% (1132) deaths were registered among 25-44 years of age group. The studies differed in the deaths in terms of road use. Our study finds most deaths in drivers/riders (36.66%) in compared to their study in which pedestrians registered highest 42.2% of deaths. However another fatal RTA trend study conducted by Dr. Kumar et al in Central India finds highest 47.7% of death victims were the motorcycle riders.[9] The study too had a preponderance of male victims (78.26%) over females similar to our study. According to WHO fact sheet on Road traffic injuries, people aged between 15 and 44 years account for 48% of global road traffic deaths.[10] Compared to this, in our study the same age group comprise of 74% of total Road traffic accidents. The above WHO fact sheet says, young males under the age of 25 years are almost 3 times as likely to be killed in a road traffic crash as young females. In our study in the same age group, the males had 6 times more mortality than females. Suicide is the second leading cause of death globally among 15–29-year-olds according to WHO fact sheet on suicide.[11] According to WHO fact sheet on drowning, drowning is the 3rd leading cause of unintentional injury death.[12] Compared to this in our study drowning came out to be second leading cause of unintentional injury after road traffic injuries. In our study among 279 fatal burn victims 58.8% were unintentional/accidental, which is very similar to the study conducted by Afify et al in Cairo City, Egypt in which 55.7% of total burn deaths were accidental.[2] Asphyxia is the commonest method (56.03%) of death in homicides in our study which is in contrast to the study conducted by Shah et al in Rajkot region, Gujarat in which mechanical injury was the commonest (77%) method and asphyxia being next.[13]

CONCLUSION

The age group 25-44 years recorded maximum deaths (37.49%). Males suffered the highest casualty accounting for 61.85% of deaths. Unintentional fatal injuries constituted 63.58% of deaths. 60.6% of the unintentional injury deaths were at the health facilities. Most of the suicidal (44.36%) and homicidal deaths (62.29%) occurred at the spot. RTAs constituted maximum (53.42%) of deaths among unintentional fatal injuries. Homicidal injuries constituted maximum of deaths due to intentional fatal injuries. Asphyxia (56.03%) was the main cause of death in homicides.

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