

Original Article

RETROSPECTIVE STUDY OF AUTOPSY CASES OF FATAL TRAUMA IN CHILDREN IN A MEDICAL COLLEGE HOSPITAL IN RURAL AREA

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RETROSPECTIVE STUDY OF AUTOPSY CASES OF FATAL TRAUMA IN CHILDREN IN A MEDICAL COLLEGE HOSPITAL IN RURAL AREA

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Abstract:

Injury and violence are major killers of children throughout the world, responsible for about 950000 deaths in children and young people under the age of 18 years each year. In 1990, injuries in the developing countries contributed to 13% of total disability adjusted life years among children. It is expected that by 2020, this share will increase to 22%.

Even in India injuries are emerging as a considerable public health problem, having one of the highest childhood disability-adjusted life year rates attributable to injuries. To implement preventive measures for injury reduction, data regarding childhood injuries should be available. Retrospective study was conducted in a medical college hospital in a rural area to assess the magnitude and causes of fatal injuries among the children. 81 autopsy reports of fatal trauma cases in children were studied in detail to assess the cause and other information.

Out of 81 fatal trauma cases majority of victims were in the age group of 13-17 years and were males (53%). Road traffic accidents (RTA), drowning and falls were leading causes of death.

Fatal trauma is one of the commonest finding in autopsies of children. Males in the age group of 13-17 years are commonly involved and Road traffic accidents, drowning and burns were the leading causes of death

Key words: Fatal trauma, autopsy, children

Introduction:

The landmark Convention on the Rights of the Child, ratified by almost all governments, states that children around the world have a right to a safe environment and protection from injury and violence. However childhood injury (trauma) is a major public health problem that requires urgent attention.

Injuries are a significant area of concern from the age of one year, and progressively contribute more to overall rates of death until children reach adulthood. Unintentional injuries are the biggest threat to their survival and are also a major cause of disabilities, which can have a long-lasting impact on all facets of children's lives.

Injury and violence are major killers of children throughout the world, responsible for about 9,50,000 deaths each year in children and young people under the age of 18 years.¹ Unintentional injuries account for almost 90% of these cases. Injuries are responsible for 30% of deaths in 1-3 year olds, with the figure approaching 40% in 4-year olds and 50% to 60% among those aged 5 to 17 years in South East Asia.²

The vast majority of child injury deaths occur in low and middle income countries where the injury mortality rate among those aged less than 15 years is five times higher than that in the high-income countries.³ Recent large-scale community-based surveys conducted in five countries in South and East Asia, revealed much higher levels of death from injury among the children.⁴ In 1990, injuries in the developing countries contributed to 13% of total disability adjusted life years among children. It is expected that by 2020, this share will increase to 22%⁵

In India also, injuries are emerging as a considerable public health problem, having one of the highest childhood disability-adjusted life year rates attributable to injuries.^{5,6} Road traffic accident (RTA) was the second leading cause of death and burden of disease among 5–14 years old in India in the year 2000.⁷

The burden of disease due child injuries have been neglected for many years, and are largely absent from child survival initiatives on the global agenda and little attention had been paid to the issue of childhood injuries in low-income and middle income countries. Because of the lack of awareness of this problem effective measures have not been implemented. To implement preventive measures for injury reduction, data regarding childhood injuries should be available, wide scale surveys should be carried out to collect the data. Present study was conducted in a tertiary health center in a rural area to assess the magnitude and causes of fatal injuries among the children.

Materials and methods:

Study design: Retrospective record based study

Study set-up: Mortuary of Rural Medical College, Loni provides services to more than 5 talukas of Ahmednagar (Rahata, Rahuri, Sangamner, Shrirampur, Kopergaon, Akole)

Study participants: All autopsy cases of children conducted during 2005-2007.

Inclusion criteria: Autopsies of children

Exclusion criteria: Autopsies in Adults

Sample Size: 105 cases (within a duration of 3 years from 2005-2007)

Data Collection: After obtaining the permission from conducting the study from the concerned authority, retrospective data of 3 years (2005-2007) was collected from autopsy reports maintained in the department of Forensic Medicine & Toxicology. Out of the total number (105 cases) of autopsies conducted among children, 81 victims died due to trauma. The demographic data type of trauma, manner of injury and cause of death were recorded. The data were compiled and analyzed by using appropriate statistical techniques.

The definition of injury used in present study was “the physical damage that results when 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”⁸

Results:

There were one hundred and five autopsies of children during the period of 3 years (2005-07) at the Post-Mortem centre of Rural Medical College, Loni. Among the total 105 autopsies 81 cases (77%) had died due to trauma.

The males (53%) were more involved in traumatic deaths than females (47%). The majority of male victims were from the age group of 12-17 years (17%) followed by 9-12 years (14%); females also followed the same pattern with 22% deaths in 12-17 years. Particularly victims from the age of 6-9 years were least affected. (Table no 1)

The leading manner of death was Road Traffic Accidents (RTA) (35%) followed by drowning (17%). Mechanical trauma accounted for 44% of deaths, asphyxial trauma (drowning) - 18%, Chemical Poisoning-17%, Burns -11%, animal bites 10%, electrocution – 7% and falls 9% (Table no. 2).

Analysis of causes of death showed following results:

Age (years)	Male No.(%)	Female No.(%)	Total No. %
0-3	08(9.9%)	06(7.4%)	14(17.2%)
>3-6	08(9.9%)	05(6.2%)	13(16%)
>6-9	02(2.5%)	04(4.9%)	06(7.4%)
>9-12	11(13.6%)	05(6.2%)	16(19.7%)
>12-17	14(17.3%)	18(22.2%)	32(39.5%)
Total	43(53.1%)	38(46.9%)	81(100%)

Table No. 1: Demographic Distribution of Autopsy Cases (n=81)

Manner	Total No.	%
RTA	28	35%
Drowning	14	17%
Burns	09	11%
Chemical Poisoning	09	11%
Snake Bite	08	10%
Electrical Injuries	06	7%
Fall	07	9%
Total	81	100%

Table No. 2: Distribution of Autopsy Cases according to manner of Death

Craniocerebral injury was the commonest nature of fatal trauma in the present study. The craniocerebral Injury (CCI) was a leading cause of death among the victims of RTA followed by asphyxia which was common among drowning victims. (Table 3)

Mechanism of Trauma	Cause of Death	Total
Road Traffic Accidents	CCI	15
	Non- CCI	13
Drowning	Asphyxia	14
Poisoning	Poisoning	09
Burns	Septicemia	04
	Shock	04
	Toxaemia	02
Snake bite	Toxemia	07
Electric injury	Cardio-respiratory failure	04
Fall	CCI	02
	Non-CCI	02
Others	CCI	03
	Cardiac Failure	02
	Traumatic Asphyxia	01
Total		81

Table No. 3: Distribution of Autopsy cases according to Mechanism of trauma.

Discussion:

In the retrospective study of 105 autopsies of children, 81 (77%) children died due to fatal injury. Injury rate was more among the age group of 12-17 years followed by 9-12 years and males were more affected than females. Similar findings were observed by Chaudhari et al and Singh et al in their studies.⁹⁻¹⁰ As per World Health report 2004, deaths due to injuries were more common in the age group of 13-16 years followed by 9-12 years. Rivara and

Chowdhury et al reported that the incidence of injury was more common among boys as compared to girls. In each age group males were at higher risk than females.¹¹⁻¹²

The factors that lead to this increased risk for males are complex and difficult to untangle. They may include inborn differences in behavior, as well as obvious differences in exposure related to traditional male and female roles in our society.

The leading causes of death in our study were road traffic accidents followed by drowning, burns, falls and poisoning. Similar order of causes was observed in study conducted in South Africa and Bangladesh.¹²⁻¹³

In the present study craniocerebral injuries were common in RTA in children due to the fact that the head constitutes a larger portion of the body than in adults.

Deaths due to asphyxial trauma were common due to drowning for that fact that children in rural area like to bathe in canals which are more than 5 feet deep. Chemical burns were due to the fact that like adults even children from rural set up are exposed to various pesticides which are highly poisonous when consumed as well as highly-inflammable when played with fire sources around. Falls from heights are not common in rural setup for the fact that there are very few construction sites, buildings and towers etc .

Conclusion:

Fatal trauma is one of the commonest finding in autopsies of children. Males in the age group of 13-17 years are commonly involved and Road traffic accidents, drowning and burns were leading causes of death.

Recommendations:

Since majority of the traumatic deaths were due to RTA and drowning, the following preventive measures can be suggested to avoid such unnatural deaths in future:

1. Rules of Motor Vehicle Act (MVA) should be stricter to control the accidents and pass a message to common peoples to avoid the trauma due to MVA. Awareness about rules imparting compulsory road safety education to school children should be spread from primary education level.
2. Provisions should be made for training of Emergency Department (ED) personnel and other "first contact" personnel in skills for early detection and brief intervention. Moreover, appropriate medical care facilities (including trauma centers) need to be established at rural level, sub-divisional and block levels to provide prompt and quality care to head injury patients.

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