Epidemiological Profile of Fatal Abdominal Injuries Secondary to Blunt Force Impact: Autopsy based Study Conducted At A. J. Institute of Medical Sciences & Research Centre, Mangaluru

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Abstract

Background: Evaluating patients who have sustained blunt abdominal trauma remains one of the most challenging and resource-intensive aspects of acute trauma care.[6,7] The objective of this dissertation is to analyse the pattern of fatal abdominal injuries secondary to blunt force impact.

Aim: The aim of this research is to analyze the pattern of fatal abdominal injuries secondary to blunt force impact

Materials and Method: Detailed observations for 38 autopsies with evidence of fatal abdominal trauma during the period October 2014 to July 2016 were carried out. Routine information like age, sex, occupation brief facts of the cases collected from the inquest report. Clinical history like time of admission, and deaths and other relevant data was collected from the hospital case sheets and death summaries.

Results: Analysis involves 38 autopsies with evidence of fatal abdominal trauma during the period October 2014 to July 2016. The most common age group involved was between 21-30 years of age comprising 26% of total 38 cases followed by the age group of 11-20 years comprising 21% of total cases. The most common cause of blunt fatal abdominal trauma was vehicular accident seen in 84% of cases. In 38 cases, it was found that 24 cases (63%) were dead on arrival. Amongst 32 vehicular accidents, a total of 21 pedestrians (66%) were killed in 38 fatal blunt abdominal trauma cases. Liver was the organ mainly affected in fatal blunt abdominal trauma followed by pelvic trauma and kidney. Haemorrhage accounted for the largest number of cases (94.74%).

Conclusion: The present study emphasizes the need for adopting measures to prevent morbidity and mortality resulting from blunt abdominal trauma.

Keywords: *Abdominal Trauma; blunt force; Hemorrhage; Pelvic trauma.*

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Introduction

Trauma is one of the leading preventable causes of death in developing countries, and is a major health and social problem. Trauma affects generally the young people, and accounts for loss of more years of life,

than lost due to cancer and heart diseases put together. Accidents are considered as a modern day epidemic and counter product of modernization and hasty life. The statistical profile reflects a global estimate of 5.1 million deaths in 2000. Road Traffic Accident (RTA) accounted one of the top five causes of morbidity and 10% -25% of mortality in South-East Asian countries.[1,2]

RTA cause mechanical trauma, resulting in morbidity, disability and even mortality. India is one of the highest victimized by road traffic accidents in the world and reported to be 20 times more than that reported in developed countries.[3]

Abdominal trauma accounts for nearly 20% of all severe traffic injuries and can often result from intentional physical violence. Blunt liver injury is regarded as the most common type of injury following abdominal trauma, and is associated with a high mortality rate.[4,5] Blunt abdominal trauma is a leading cause of morbidity and mortality among all age groups. Identification of serious intra-abdominal pathology is often challenging. Many injuries may not manifest during the initial assessment and treatment period. Missed intra-abdominal injuries and concealed hemorrhage are frequent causes of increased morbidity and mortality, especially in patients who survive the initial phase after an injury.

Blunt abdominal trauma usually results from motor vehicle collisions (MVCs), assaults, recreational accidents, or falls. The most commonly injured organs are the spleen, liver, retroperitoneum, small bowel, kidneys, bladder, colorectum, diaphragm, and pancreas. Men tend to be affected slightly more often than women.

Physical examination findings are notoriously unreliable. One reason is that mechanisms of injury often result in other associated injuries that may divert the physician's attention from potentially life-threatening intra-abdominal pathology. Other common reasons are an altered mental state and drug and alcohol intoxication.

The care of the trauma patient is demanding and requires speed and efficiency. Evaluating patients who have sustained blunt abdominal trauma remains one of the most challenging and resource-intensive aspects of acute trauma care.[6,7] The objective of this dissertation is to analyse the pattern of fatal abdominal injuries secondary to blunt force impact.

Materials and Method

Detailed observations for 38 autopsies with evidence of fatal abdominal trauma during the period October 2014 to July 2016 were carried out. Due permission was taken from Institutional Ethics Committee of A.J. institute of Medical Sciences & Research Centre, Mangalore for the conduct of the study.

Routine information like age, sex, occupation brief facts of the cases collected from the inquest report. Clinical history like time of admission, and deaths and other relevant data was collected from the hospital case sheets and death summaries. Pattern, nature of injuries, complications, cause of death and mechanism of death were obtained from a detailed follow up and study of the autopsy cases and reports.

Results

Detailed observations for 38 autopsies with evidence of fatal abdominal trauma during the period October 2014 to July 2016 were carried out and various statistical results were drawn from them. The most common age group involved was between 21-30 years of age comprising 26% of total 38 cases followed by the age group of 11-20 years comprising 21% of total cases. Children below 10 years constituted only 8% of total cases. Persons above 60 years constituted only three cases, i.e., 7.9% of total cases.

The most vulnerable age group involved among males was between 21-30 years of age followed by the age group of 11-20 years. The most vulnerable age group involved among females was between 21-30 and 31-40 years of age as depicted Figure 1. Among those 38 cases studied, males comprised 29 cases, i.e., 76.32% of cases, while females were only 9 in number, i.e., 23.68% of cases.

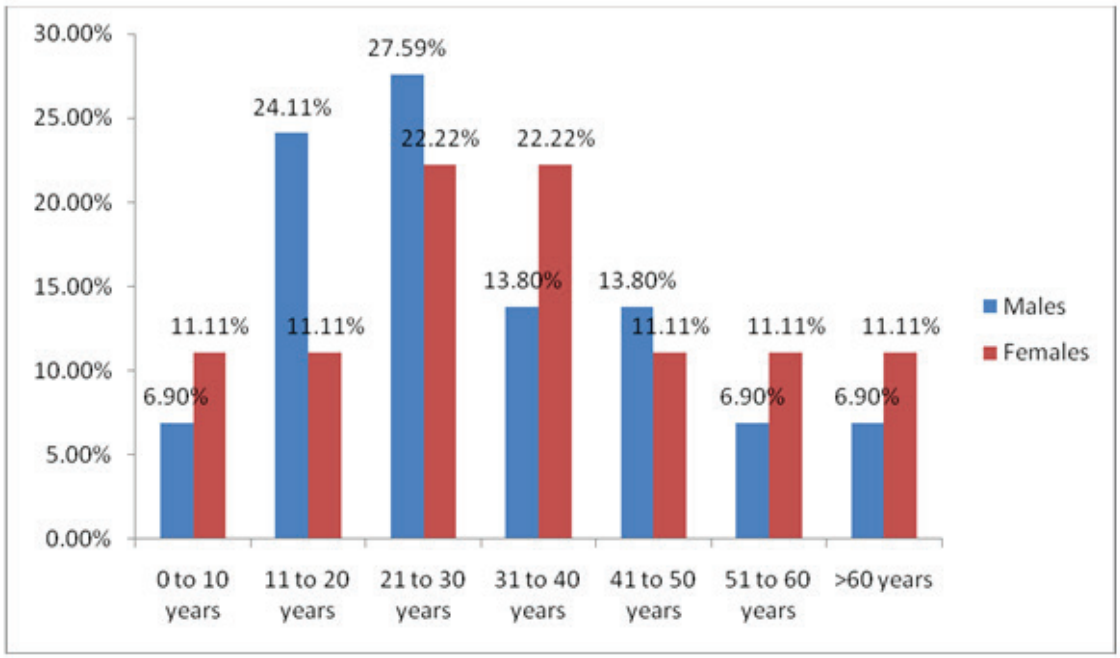

Figure 1: Age and sex wise distribution of cases

The most common cause of blunt fatal abdominal trauma was vehicular accident seen in 84% of cases followed by fall from height constituting 13% of cases.

In 38 cases, it was found that 24 cases (63%) (Were dead on arrival i.e., died at the scene/spot or were brought dead to the casualty as depicted in Figure 2. Those surviving for more than a day constituted only 8% of the cases.

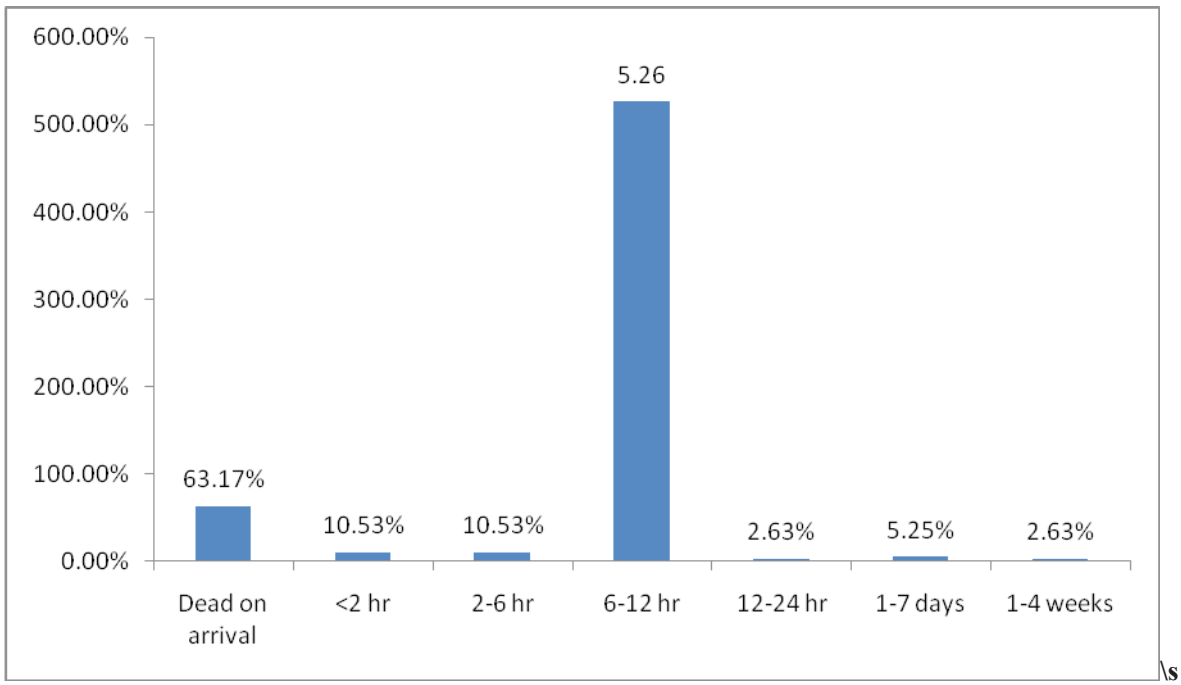

Figure 2: Distribution of cases in relation to period of survival

Amongst 32 vehicular accidents, A total of 21 pedestrians (66%) were killed in 38 fatal blunt abdominal trauma cases. The next common category was two wheeler occupants which accounted for 10 cases (31%). Car occupants were not involved in any case as illustrated in Table 1.

Table 1: Mode of causation of blunt injury

Type of Victim	Number of victims	Percentage
Pedestrian	21	65.68
Two wheelers occupants	10	31.22
Cyclist	1	3.10
Car occupants	0	0
Bus/Truck passenger	0	0
Total	32	100

Liver was the organ mainly affected in fatal blunt abdominal trauma followed by pelvic trauma and kidney as described in Table 2.

Table 2: Number of victims in relation to different organs injured

Age group	No of Victims	Liver	Spleen	Bowel	Pancreas	Kidney	Ureter	Bladder	Pelvis
0-10	3	2	1	1	0	1	0	1	1
11-20	8	5	3	0	0	2	0	1	3
21-30	10	7	4	2	0	4	0	3	8
31-40	6	5	3	1	1	5	1	3	4
41-50	5	4	2	1	1	2	0	2	3
51-60	3	2	1	0	0	1	0	1	1
>60	3	2	1	1	0	2	0	0	1
total	38	27	15	6	2	17	1	11	21

In all the cases studied manner of death was accidental. Haemorrhage accounted for the largest number of cases (94.74%) followed by Speticemia (5.26%) as illustrated in Figure 3.

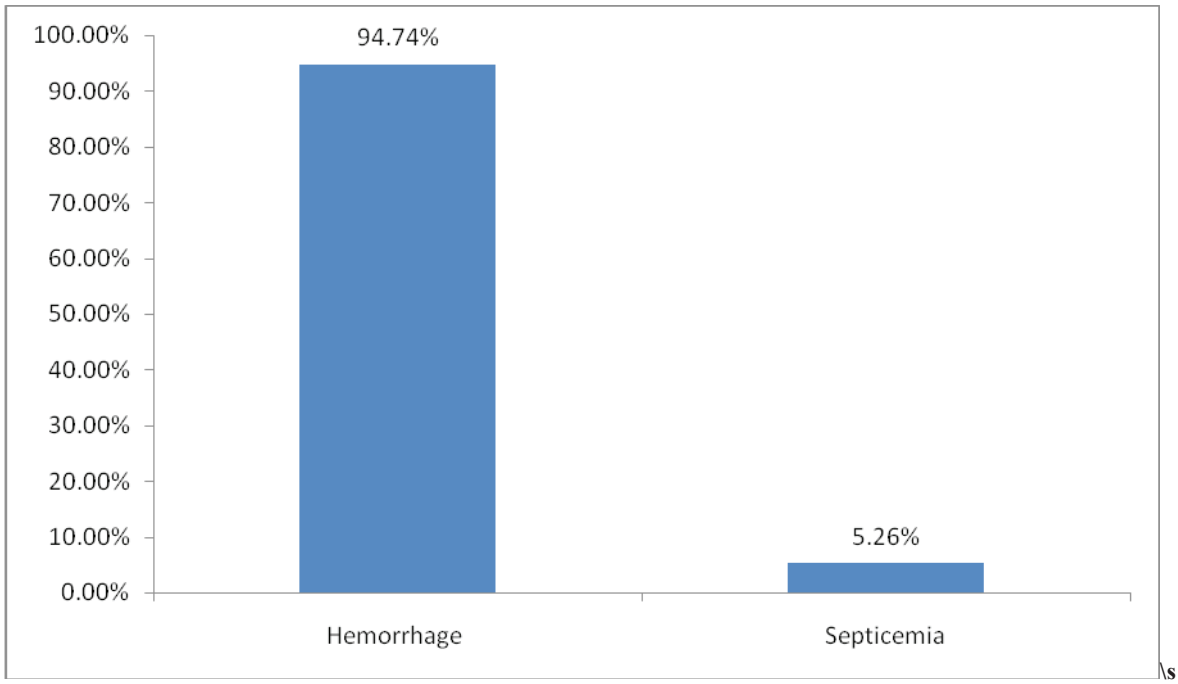

Figure 3: Cause of death

Discussion

In the present study it was observed that majority of cases were males in the age group of 21-30 years. The large number of cases in this age group can be attributed to the fact that this period of life is the most vulnerable to trauma because of a very high level of outdoor activities. Male dominance in this type of injury could likely be due to the fact the males are more exposed to trauma as they constitute working and earning member in majority of families and so move out of the house more often than females, Similar findings were also observed by Jha et al, Meera and Nabachandra, Rautji et al, Sharma et al, and Mansar et al [8-12]

In the present study, majority of fatal blunt abdominal injuries were due to vehicular accidents. There was no case of assault by blunt weapon. This finding is also in agreement with the work of Meera and Nabachandra who also observed that the commonest cause of blunt thoracoabdominal trauma was vehicular accidents (86.40%).[9]

Liver was injured in maximum number of cases. This may be due to the fact that in maximum number of vehicular accidents causes primary impact injuries over the upper abdominal region. Another reason for the greater involvement of the liver could be due to fall on the ground after impact with offending vehicle leading to liver injury.

These findings are also in agreement with the findings of Bergqvist et al who studied patients with abdominal trauma and fatal outcome in an analysis of a 30-year series in a rural Swedish area. They found that Patients with blunt abdominal trauma with fatal outcome comprised of 127 patients and found that one fourth of these patients died from an abdominal injury alone.[13]

A total of 21 (66%) pedestrians were killed in 38 fatal blunt abdominal trauma cases. Similar increased numbers of abdominal trauma among pedestrians have also been reported by Jha et al, Meera and Nabachandra, and Sharma et al (Table 18).The next common category was two wheeler occupants which accounted for 10 (31%) cases. Car occupants were not involved in any case. The pedestrians in most of the instances were knocked down by vehicles leading to fatal abdominal injuries. Encroachment of pavements making people walk on roads, little segregation between vehicular and pedestrian traffic, lack of awareness among pedestrian of road rules and lack of pedestrian crossings are some of the reasons for increased involvement of pedestrians. Poor maintenance of roads and lack of observance of traffic rules by vehicular traffic are some other reasons.[8-10]

In the present study majority of cases were dead on arrival. Similar findings have also been reported by Meera

and Nabachandra and Sharma et al. This emphasizes the fact that most of our vital organs are present in the chest and abdominal cavity and further the abdominal cavity lacks any protective bony cover. So trauma quickly leads to injuries to the vital organs and major blood vessels present in the thoracic and abdominal cavities. Inadequate infrastructure for early transport of victims and lack of proper management of trauma patients on the way to hospital because of traffic congestion on the highway leads to early deaths. These victims need on–spot emergency, medical care and rapid transportation from the incident site to the hospital which is lacking in this part of the world.[9,10]

Conclusion

Analysis involves 38 autopsies with evidence of fatal abdominal trauma during the period October 2014 to July 2016. The most common age group involved was between 21-30 years of age comprising 26% of total 38 cases followed by the age group of 11-20 years comprising 21% of total cases. The most vulnerable age group involved among males was between 21-30 years of age followed by the age group of 11-20 years. The most vulnerable age group involved among females was between 21-30 and 31-40 years of age. The most common cause of blunt fatal abdominal trauma was vehicular accident seen in 84% of cases. In 38 cases, it was found that 24 cases (63%) were dead on arrival i.e., died at the scene/spot or were brought dead to the casualty.

Amongst 32 vehicular accidents, a total of 21 pedestrians (66%) were killed in 38 fatal blunt abdominal trauma cases. Liver was the organ mainly affected in fatal blunt abdominal trauma followed by pelvic trauma and kidney. In all the cases studied manner of death was accidental. Haemorrhage accounted for the largest number of cases (94.74%).

Ethical Clearance: Ethical Clearance was taken from Institutional Ethics Committee of A.J. institute of Medical Sciences & Research Centre, Mangalore for the conduct of the study.

Source of Funding: Self.

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