Pattern of Abdominal Viscera Injuries in Blunt Abdominal Trauma Deaths in Ahmedabad

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Abstract

In this age of speed and traffic accidents, the incidence of blunt injuries to the abdomen has been at its height due to the development of the modern industrial era with the development of the automobile. This study was conducted to describe the frequency and pattern of intra-abdominal injuries in patients with blunt abdominal trauma.

The present study was undertaken on 693 victims who died due to blunt abdominal injuries which were autopsied at B. J. Medical College mortuary, Ahmedabad during the year 2016-2017. This study shows that most common organ involved in blunt abdominal injuries is liver. Most common associated injuries with this is chest injuries. Highest number of people died due to shock and hemorrhage.

Keywords: Blunt abdominal trauma; Intra-abdominal injuries.

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. Since prehistoric times, the abdomino-pelvic cavity has been looked upon as one of the most vulnerable regions of the body and injuries involving it have always been considered very serious. As early as 460 BC, Hippocrates was aware of the danger to life caused by injury to liver and spleen ¹.

Most of the information about abdominal trauma has been gained through military experiences, as Sir Winston Churchill stated, “War is an epidemic of trauma” ². It is only in the recent time that the automobile became more deadly than the raffle. Deaths are occurring every day, in many different settings, from injuries to the upper abdomen and lower rib cage that produce damage to the liver, spleen and pancreas. The location and severity of the blow and the position of the victim when injured determine which combination of organs is affected.

In open cases of abdominal trauma the clinical manifestations, diagnosis and management will be easier. But closed cases of trauma, offers a great challenge to the treating surgeon. Sometimes it may escape detection or lead to an error in diagnosis from medico-legal point, and the same is often true with autopsy doctor, where in closed cases of abdominal trauma, the autopsy findings may sometimes be trivial or complex and frustrating. It may be difficult to interpret the anatomic abnormalities to understand the mechanism of death, and may require a lengthy explanation. The object of the dissertation is to make a comprehensive study of pattern of blunt abdominal injuries, which are fatal and resulting in death.

Materials and Method

The present study was conducted at B. J. Medical College, Ahmedabad. Total 693 cases of deaths of all age groups and both sex from blunt abdominal trauma during the year 2016-2017 were taken up for study. Death due to head injury, chest injuries where abdominal injuries are minor and badly decomposed bodies where significant injuries were not visible also not included in
this 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 and other information were obtained from a detailed follow up and study of the autopsy cases and reports. Finally all the data thus collected, complied and presented in the tables.

Results

The present study comprised 693 (15.1%) autopsy cases of deaths due to blunt abdominal injuries, out of total 4588 medico-legal autopsies (Table-1). Liver was commonest organ injured in 74% cases. Out of 511 cases, 333 cases were due to injury by motor vehicles, 116 cases were due to fall from height. splenic injury was found in 36.65% cases. Out of 254 cases, 170 cases were due to injury by motor vehicles, 56 case due to fall from height and 16 cases due to railway hit. Injury to intestine was found in 13.85% cases. Out of total 96 cases, 63 cases were due to injury by motor vehicles. Kidney was found injured in 11.11% cases. Out of 77 cases, 49 cases were due to injury by motor vehicles 20 case due to fall from height and 6 cases due to railway hit. Stomach was found injured in 4.76%. Out of 33 cases, 26 cases were due to injury by motor vehicles 5 case due to fall from height. Urinary bladder was found injured in 1.15% cases. All cases were injured due to injury by motor vehicles. Most common associated injuries with blunt abdominal injuries are chest injuries. It is followed by fracture and head injuries. In males out of 549 cases hemorrhage is seen in 460 cases and in females in 117 cases, where as infection cases 77 cases are of males and 25 cases are of females. Multi organ failure is seen in 2.00% of cases.

Table 1: No. of Cases of Death Due to Blunt Abdominal Injuries

| Death due to Blunt Abdominal Injuries | NO. OF CASES | PERCENTAGE (%) |
|--------------------------------------|--------------|----------------|
| Total Autopsies                      | 4588         | 100            |

Table 2: Abdominal Viscera Involved

| Abdominal Viscera Involved          | Cases | Percentage | Rta | F/H | Railway Hit | Assault | Others |
|-------------------------------------|-------|------------|-----|-----|-------------|---------|--------|
| Spleen                              | 254   | 36.65      | 170 | 56  | 16          | 11      | 1      |
| Liver                               | 511   | 73.74      | 333 | 116 | 33          | 23      | 6      |
| Small Intestine                     | 96    | 13.85      | 63  | 22  | 7           | 4       | 0      |
| Gall Bladder                        | 22    | 3.17       | 13  | 7   | 1           | 1       | 0      |
| Kidney                              | 77    | 11.11      | 49  | 20  | 6           | 2       | 0      |
| Stomach                             | 33    | 4.76       | 26  | 5   | 1           | 1       | 0      |
| Urinary Bladder                     | 8     | 1.15       | 8   | 0   | 0           | 0       | 0      |
| Internal Reproductive Organ         | 13    | 1.88       | 8   | 4   | 0           | 1       | 0      |
| Mysentry                            | 34    | 4.91       | 24  | 6   | 3           | 1       | 0      |
| Large Intestine                     | 0     | 0.00       | 0   | 0   | 0           | 0       | 0      |
| Major Vessels                       | 0     | 0.00       | 0   | 0   | 0           | 0       | 0      |
| Pancreas                            | 35    | 5.05       | 24  | 9   | 2           | 0       | 0      |
Table 3: Associated Injuries

| Associated Injuries | Cases | Percentage (%) |
|---------------------|-------|----------------|
| Head Injury         | 72    | 22.50          |
| Chest Injury        | 134   | 41.88          |
| Fracture            | 114   | 35.63          |
| Combined            | 11    | 3.44           |
| Other               | 1     | 0.31           |

Table 4: Mechanism of Death

| Mechanism of Death         | Male | Female | Cases | Percentage (%) |
|----------------------------|------|--------|-------|----------------|
| Shock And Haemorrhage      | 460  | 117    | 577   | 83.26          |
| Infection                  | 77   | 25     | 102   | 14.72          |
| Multy Organ Failure        | 12   | 2      | 14    | 2.02           |
| Total                      | 549  | 144    | 693   | 100.00         |

Discussion

The observations and results of the present study were compared and contrasted with the work of preceding researchers.

As shown in Table 2, Liver was commonest organ injured in 74% cases. It was consistent with the findings of Abdelrahman H and Morales Uribe CH. Out of 511 cases, 333 cases were due to injury by motor vehicles, 116 cases were due to fall from height, 23 cases were due to direct blow on abdomen by lathi, hockey etc., 3 cases were due to fall of roof upon the deceased. Tonge et al had reported 24.9% incidence of liver injury in fatal road accidents. Kaur study showed liver injuries in 16.55% cases of motor cyclists. 22.7% liver injuries were reported by Hussain et al. and 15% by Hoyt.

As shown in Table 2, splenic injury was found in 36.65% cases. Tonge et al reported splenic injury in 21% of cases. Another observation derived in the present series shows out of 254 cases, 170 cases were due to injury by motor vehicles, 56 case due to fall from height and 16 cases due to railway hit.

As shown in Table 2, Injury to intestine was found in 13.85% cases. This incidence was 6.2% in the observation of Tonge et al. Out of total 96 cases, 63 cases were due to injury by motor vehicles.

As shown in Table 2, Kidney was found injured in 11.11% cases. Out of 77 cases, 49 cases were due to injury by motor vehicles 20 case due to fall from height and 6 cases due to railway hit. It is consistent with the findings of Kaur in which she reported that kidney injury was found more commonly in fatal heavy motor vehicular and two wheeler accidents.

As shown in Table 2, stomach was found injured in 4.76%. Out of 33 cases, 26 cases were due to injury by motor vehicles 5 case due to fall from height. Tonge et al reported the incidence of 0.8% while Bruce et al (1965) reported stomach injury in 2% of cases. Urinary bladder was found injured in 1.15% cases. All cases were injured due to injury by motor vehicles. Incidence of urinary Bladder injury reported by Tonge et al was 4.9%. Kaur in her study of fatal auto vehicular two wheeler accidents reported incidence of 1.37%.

Gall Bladder was found injured in 3.17% cases and pancreas was found injured in 5.05% cases. The incidence of gall bladder & pancreatic injury reported by Tonge et al was 1.7%; the similar explanation had been given by Orr.

The present study showed that parenchymatous visceral injury is common than hollow visceral injury in both sexes (2:1). This is because consistency of parenchymatous viscera and hollow viscera has some
capacity to absorb the force of blow. In most of the cases multiple organ involvement was very common.

Involvement of uterus in female cases was a rare phenomenon as it is strongly protected by pelvic cage. In all cases bladder involvement is associated with fracture public symphysis. The most commonly associated part along with abdomen involved is chest due to its close proximity with abdomen. It showed rib fractures and lung injuries. Hemorrhage is more common with parenchymatous injury where death has occurred within 12 hours after sustaining trauma (57.43%).

Infection is more common with hollow visceral injury where death is delayed. The ratio of incidence between hemorrhage and infection is more or less common in both males and females. In males out of 549 cases hemorrhage is seen in 460 cases and in females in 117 cases, where as infection cases 77 cases are of males and 25 cases are of females.

**Conclusion**

The present study was undertaken to focus light upon the pattern of blunt abdominal injuries in relation to various factors in the Ahmedabad. Total No. of 693 cases were studied in the year 2016-2017. The result of the present study is summarized as follows.

1) Liver is the most commonly involved organ in blunt injuries of abdomen followed by spleen, small intestine, kidney, mense, stomach, gall bladder, urinary bladder and pancreas in decreasing order respectively.

2) In most of the cases, involvement of more than one viscera is reported.

3) Very high incidences of associated injuries in the form of chest injuries, followed by fractures and head injuries were noted. Chest injury is the most commonly associated injury (41.88%) due to its close proximity with abdomen.

4) Most common cause of death was shock and haemorrhage (83.26%), especially when the person dies within few hours. In those cases where death was delayed, cause of death was infection (14.72%)

**Conflict of Interest** – None declared

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**Ethical Clearance**– The study was approved by institutional ethical committee.

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