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AUTOPSY STUDY ON SPLENIC INJURIES DUE TO BLUNT INJURY ABDOMEN - A CROSS SETIONAL STUDY

Forensic Medicine

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ABSTRACT

The abdominal cavity extends superiorly into the Osseo cartilaginous thoracic cage to the fourth intercostal space. Consequently, the more superiorly placed abdominal organs (spleen, liver, part of the kidneys, and stomach) are protected by the thoracic cage. It should be appreciated that, from the forensic aspect, the spleen that they lie beneath the costal margin, and is vulnerable to both stabbing and blunt injury to the abdomen. Even with the improvement in safety measures in vehicles and greater availability of state of art of resuscitative measures, the mortality rate in injuries to the abdominal region has not declined. Despite significant social impact of trauma, few reliable epidemiological data are available for the study of trauma in India. The lack of data concerning abdominal trauma specially splenic injury reflects this deficiency. This study was conducted to study the pattern of splenic injuries in abdominal injuries cases in autopsy cases over a two year time period in a tertiary care institute in Chennai.

KEYWORDS

Blunt trauma abdomen, road accidents, splenic injuries,

1. INTRODUCTION

Spleen lies in the left hypochondriac region of the abdomen, its long axis being parallel to that of 9thrib, behind the stomach and inferior to the diaphragm. On account of its position, rupture of the spleen is rare unless caused by considerable crushing or grinding force. The spleen may sometimes be ruptured by the broken ends of a rib which may be caused by the blunt trauma The abdominal cavity contains the vital organs like liver, spleen, kidney, stomach, intestines etc, and trauma to this region challenges the integrity and even the viability of the individual. Because of its size and anatomical position, it is a major site of trauma in road accidents. Repeated clinical examinations and observations for the appearance of clinical signs and symptoms in persons with abdominal injuries are more important than any other investigation. Majority of deaths of trauma victims have medico-legal implications. It is therefore necessary to establish the cause of death to get compensation from the State or from insurance companies. The abdominal injuries due to blunt trauma deserve more detailed consideration as many of these lesions are not immediately fatal and present difficult clinical problems for the surgeon to solve. Autopsy still remains the “gold standard” by which the physician's clinical diagnosis is confirmed, amended or refuted. It is the most reliable and accurate instrument for investigation of injuries Early recognition of the injuries and providing an immediate treatment are mandatory for saving the lives of many of these patients If they are overlooked and neglected, their situations would eventually have medico-legal implications The primary mechanism of chest and abdomen injury is compression of the body at high rates of loading. This causes deformation and stretching of internal organs and vessels. When the compression of the torso exceeds the rib cage tolerance, fractures occur and internal organs and vessels can be contused or ruptured. In some chest impacts, however, internal injury occurs without skeletal damage. This can happen during high-speed loading. It is due to the viscous orrate-sensitive nature of human tissue as biomechanical responses differ for low- and high-speed impact Abdominal deformation also causes spleen to move relative to each other, stretching and shearing the vascular attachment at the hilar region An accurate and a detailed understanding of the frequency and types of injuries leads to more accurately targeted measures of prevention, diagnostic algorithms, education and capital investment management. The incidence of intra-abdominal injury mainly splenic injury from blunt trauma continues to rise, as world populations increasingly rely on motor vehicles for transportation. The lack of data concerning abdominal trauma reflects paucity of reliable epidemiological information. This study was conducted to study the pattern of splenic injury in abdominal injuries seen in autopsy cases over a two year time period in a tertiary careinstitute in Chennai.

2. AIM:

To study the splenic injury and associated peritoneal and retroperitoneal injuries in blunt abdominal injuries

3.MATERIALAND METHODS

Selection of cases: Materials for the present study were collected from the medico legal autopsies, showing abdominal injuries carried out at the mortuary of Madras Medical College, Chennai over a two year period. The total number of cases studied was fifty and relevant statistical data was drawn from these cases.

Criteria of selection of cases

Inclusion criteria

1. All the autopsies showing abdominal trauma due to blunt trauma with a known method included in the study.
2. All those cases of blunt abdominal trauma, who were hospitalized following accident and subsequently succumbed to their injuries were also included in the study.

Exclusion criteria

Decomposed bodies and those autopsies where the nature of injury was not known, were not included in the study.

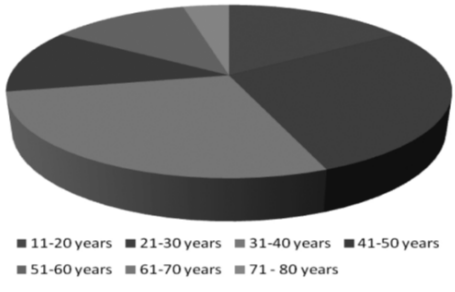
Collection of data

The relevant information obtained in every case was systematically recorded in a detailed proforma specially prepared by me for the post mortem evaluation of abdominal trauma victims. Data was tabulated in Microsoft excel and analyzed

4. RESULTS & DISCUSSION

Splenic injury in abdominal trauma is one of the important causes of mortality in accidents. Its incidence is fast increasing due to various factors relating to modern civilization. The fast increasing incidence can be explained by lack of proper planning and failure to develop infrastructure to cope with the hazards of modern civilization.

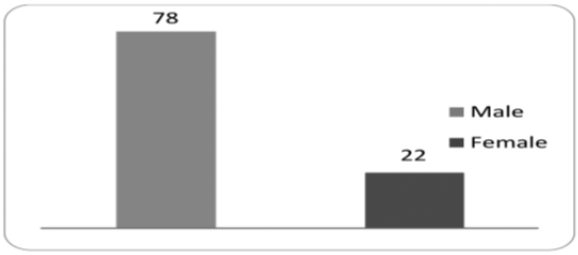
FIGURE 1: AGE DISTRIBUTION



Sex of the victims

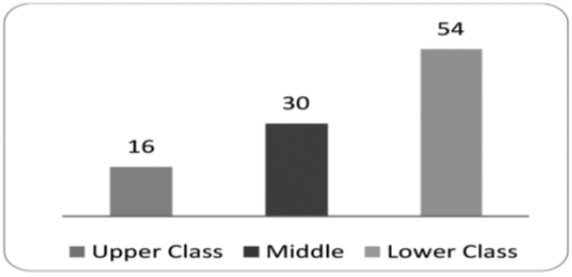
In the present series, it was observed that males dominated females. This dominance of males has also been reported by various workers-Kaare Solhem [3] Rush E.Netterville [4] J.Chandra et al [5] and D.Bergvist et al[6] This dominance of males in readily explainable by the fact that males are more exposed to hazards of roads, industry, violence and sports as they constitute working and earning member in majority of the families.

FIGURE 2: SEX INCIDENCE



In the present series, maximum number ofv ictims of abdominal trauma was from the lowere conomic class. It tallies with the finding of thes tudy conducted by Chalya et al.[7]

FIGURE 3: SOCIOECONOMIC STATUS



Agents

In the present series, Road Traffic Accident was the most common type of accident (66%). Road traffic accidents as the most common cause of blunt trauma injuries has also been reported by Bernard R.Boulanger et al C.L.Ong etal

Type of victims in the Cases Involved

The following were the types of victims involved- pedestrians 38% rider of the two wheelers and workers due to fall from height18% each; cyclists 14%; pillion riders and occupants autos 4% each; car drivers and van occupants 2 % each

FIGURE 4: TYPE OF VICTIM INVOLVED

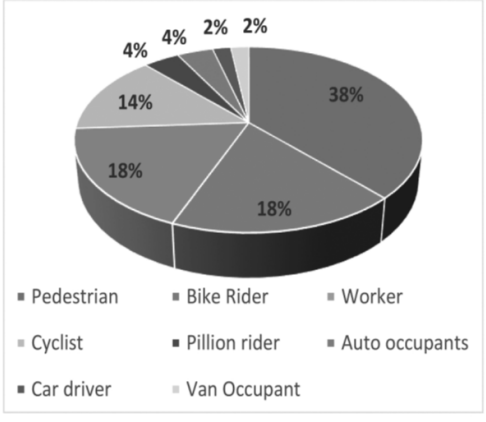
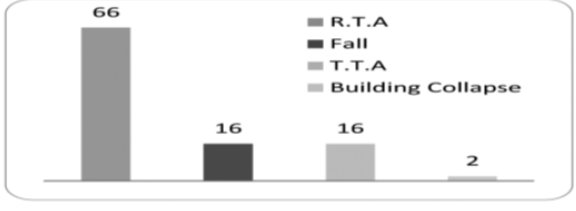


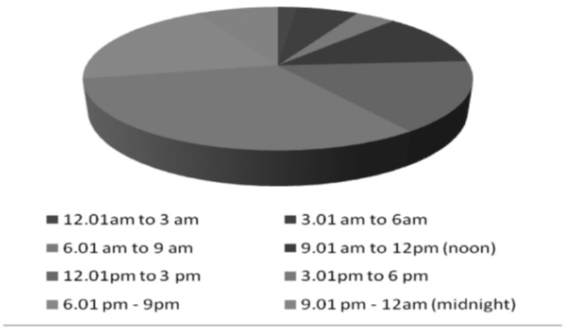
FIGURE 5 : INCIDENCE OF TYPE OF ACCIDENT



Diurnal variation in the cases involved

In the present series, maximum number of vehicular accidents occurred at the evening accounting for 32% of the cases. The reasons for this high incidence includes, overcrowding, disobeying of traffic rules, drinking etc. The second peak occurred during the period of6.01p.m-9.00p.m.accounting for 20% of total cases

FIGURE 6 : DINURNAL VARIATION IN THE STUDY



Survival period

In the present study majority of the cases were either spot dead (16%) or brought dead (22%) to the hospital. This emphasizes the fact that these victims need on the spot emergency medical care and rapid transportation from the incident site to the hospital

FIGURE 7 : SURVIVAL PERIOD

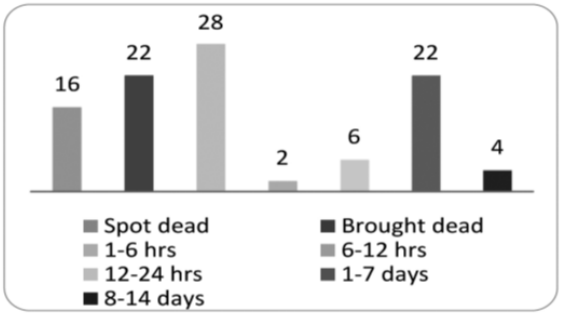


FIGURE 8: SPLENIC INJURY BETWEEN MALE AND FEMALE

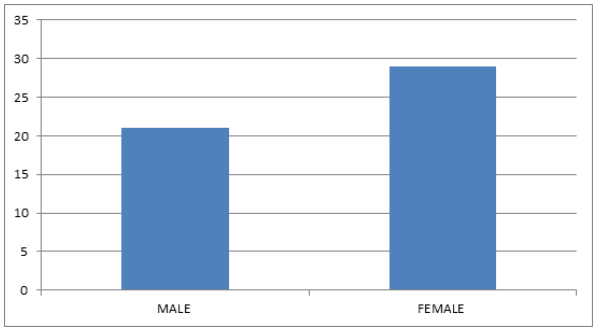
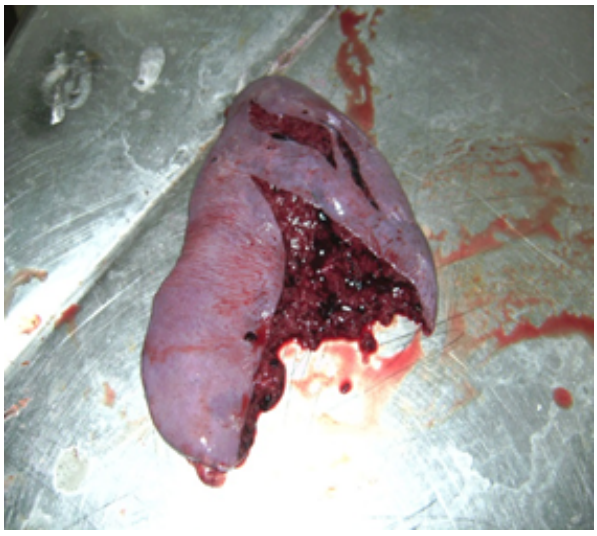


FIGURE 9: DECEASED ENLARGED SPLEEN

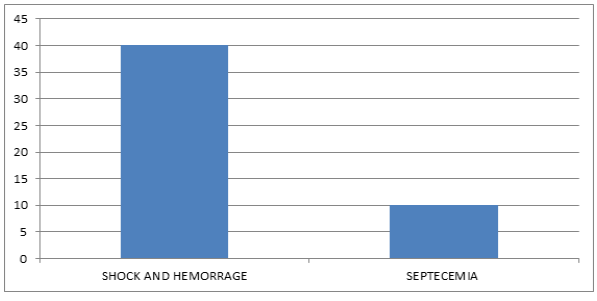
FIGURE 10: LACERATED SPLEEN



The study was done for a period of 2 years. The total number of cases was 50. Majority of the victims of abdominal trauma were due to traffic accidents. Factors contributing to increased number of fatal accidents in Chennai were multiplicity of the vehicles running on the same road, overcrowding, and to a large extent lack of traffic sense, mainly amongst bus and truck drivers, pedestrians crossing the roads at their own will, especially at busy traffic points. In the present series, maximum number of victims of abdominal trauma was from the lower economic class. It tallies with the finding of the study conducted by Chalya et al. [7]In the present series, maximum number of vehicular accidents occurred at the evening accounting for 32% of the cases. The reasons for this high incidence includes, overcrowding, disobeying of traffic rules, drinking etc. The second peak occurred during the period of6.01p.m-9.00p.m.accounting for 20% of total Cases In the present study majority of the cases were either spot dead (16%) or brought dead (22%) hospital. This emphasizes the fact that these victims need on the spot emergency medical care and rapid transportation from the incident site to the hospital

In the present series, all cases of spleen injuries were due to blunt force impact of which majority (15.6%) occurred due to vehicular accidents. Similar findings have also been reported by R.Chandulal [10] A.K.Sharma[1] C.L.Ong et al [9] In the present study, majority (54%) of spleen injuries were found associate with rib fractures following road traffic accidents, which tallied with the opinion of Gordon and Shapiro [12] andA.K.Sharma[1]

FIGURE 9 : CAUSE OF DEATH



Peritoneal and Retro- Peritoneal Haemorrhages: Majority of cases of peritoneal haemorrhage in the present study were due to spleen injuries.This tallied well with findings of Gordon and Shapiro [12] and A.K.Sharma [1] Retro-peritoneal haemorrhage was caused by blunt trauma in majority of cases produced by vehicular accidents and was found associated with pelvic fractures in majority of the cases.

5. CONCLUSION:

Splenic injuries occur in combination with other abdomino-pelvic injuries, commonly with mesenteric, diaphragmatic and splenic injuries. The primary mechanism of chest and abdomen injury is compression of the body at high rates of loading. This causes deformation and stretching of internal organs and vessels. When the compression of the torso exceeds the ribcage tolerance, fractures occur and internal organs and vessels can be contused or ruptured. In some chest impacts, however, internal injury occurs without skeletal damage. This can happen during high-speed loading. It is due to the viscous orrate-sensitive nature of human tissue as biomechanical responses differfor low- and high-speed impact As spleen injuries increase in severity, other organ systems may become involved and so, total mortality may result from the cumulation of all damaged organs. This also emphasizes the need of a proper monitoring of the victims of trauma. The present study was undertaken to focus light upon the pattern of splenic injury in abdominal injuries in due to blunt trauma in relation to various factors. The results of the present study reinforces that abdominal trauma is a major cause of mortality among young adult males, more so who belong to the lower socio-economic class. Vehicular accidents were the most common cause of injuries. Spleen was involved in majority of the victims. The main cause of death was hemorrhagic shock and hemorrhage due to splenic injuries. At the end it may be said that all abdominal injuries constitute a potential factor in increasing the amount of morbidity and mortality and therefore proper attention towards their accurate diagnosis and satisfactory management is mandatory. A multidisciplinary approach is required for treating trauma victims to improve the outcome. Awareness of road safety measures amongst common public, strict enforcement of the already existing measures and prompt treatment of the accident victims will bring down the mortality and morbidity which is preventable.

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