

A profile study of death due to blunt trauma to abdomen

Vinod Kumar Garg¹, Sachin Kumar Meena^{2*}, Brijesh Tatwal³

¹Assistant Professor, ²Senior Demonstrator, Dept. of Forensic Medicine and Toxicology, Govt. Medical College Kota, Rajasthan, India

***Corresponding Author: Sachin Kumar Meena**

Email: drsachinmeena@gmail.com

Abstract

Trauma to abdomen and its complication causes mortality to any age groups. The solid organ such as spleen, liver kidney, pancreas etc are the most vulnerable, while the hollow viscera like stomach, Intestines and bladder are likely to be involved less. The outstanding features of injury to solid organ are hemorrhage and shock while shock follows with development of peritonitis is occurred in case of injury to hollow visceral organs. This study describes the frequency and pattern of blunt abdominal trauma which is amongst the common cause of mortality among any age group. Aim of this study to analyze the pattern of injury, find out the cause of death with preventive measures. The present study was undertaken on 184 victims died due to blunt trauma to abdomen which were autopsied at GMC Kota mortuary during 2017 to 2018. This study shows that number of deaths due to blunt trauma to abdomen are more in males with age groups of 21-30 years. Major causes for these are road traffic accident. Most number of deaths occurs within 1-6 hours of injuries. Hemorrhagic shock is the main cause of death.

Keywords: Blunt abdominal trauma, Intraabdominal injuries, Hemorrhagic shock.

Introduction

Abdominal cavity is most vulnerable region of body and injury to this area is most serious. As early as 460 BC Hippocrates was aware of the danger to life caused by injury to spleen and liver. Blunt abdominal trauma is one of the leading preventable causes of unnatural death in developed and developing countries.¹ In open cases of abdominal trauma the clinical manifestations, diagnosis and management will be easier but in closed cases of trauma to abdomen is challenging to surgeons. From medico legal point of view the same is true as autopsy pathologist where in closed cases of abdominal trauma, autopsy findings sometimes be vial complex. Anatomical abnormality difficult to interpreted the mechanism of death and requires long explanation. Objects of this study to make comprehensive study of abdominal injuries in cases of blunt trauma. Blunt trauma used to cause by force a form of energy.²⁻⁴ Blunt force creates variety of injuries which fall in two groups.⁵

1. Closed includes Bruises, contusion; hematoma simple fraction & visceral laceration.⁶
2. Open includes scratches, abrasion, laceration and avulsion.

There are following causes of blunt trauma to abdomen-Road traffic accident, warfare injuries, battering, fall from height, sports accidents, martial arts, athletics injury etc.^{2,5}

Endogenous and exogenous determine the types and degree of visceral damage sustained when blunt force traumatized the abdomen.⁷

Blunt force injuries of the abdominal organs are divided into two groups also

1. Injuries to the parenchymatous viscera
2. Injuries of the hollow abdominal viscera & attachment.^{8,9} parenchymatous viscera are liver, spleen, kidneys and pancreas. These organs protected by bones and located deep in abdomen. The principal complication which causes death injuries of the

parenchymatous organ is hemorrhage in abdominal cavity.^{2,5} hollow abdominal viscera include, GIT, urinary bladder, pregnant uterus. These structures much more fragile because of less protection.¹⁰

Hemorrhage from contained organs, perforation of G.I canal with addition to infection are complication of abdominal injuries.^{11,13}

Materials and Methods

Present study was a retrospective study which was conducted from 1st January 2017 to 31st evener 2018. Total 184 cases of death of all age groups and both sex from blunt trauma to abdomen taken for study. Routine information like age, sex, occupation of the victims collected from the inquest report. Clinical history like admission, death other data was collected from the hospital record, mechanism of death obtained detail study of autopsy report finally all the data collected compiled and presented.

Observation and Results

Most likely person to have abdominal trauma is healthy young adult out of 184 total cases. 136 were in the age groups of 21-40 years which is about 80%. Only 16 cases note down in age group which were less than 20 years and 32 were above age group of 40. (Table 1) Male defeated the woman in all age groups as they are 152 comparisons to woman were only 32. Nature of violence were classified in 5 specific groups, RTA, Assault, fall from height, industrial injury and others. Injury due to RTA outnumbered the others as it was 134 and next was assault.(Table 2) in both gender the period of survival was 1-6 hours contains 62 males and in females 0-1 hours having 10 females. Death due to complication of blunt trauma to abdomen after 7 days noted in 2 males and only in 1 female. (Table 3) liver was involved in most number of cases as it was involved in 64 cases (35%). Intestine was the next organ which was involved in blunt trauma to abdomen. Least affected organs

were uterus and pancreas; both were involved in 0 cases. (Table 4). Internal hemorrhages were the commonest cause of death followed by neurogenic shock, as 132 male were died due to hemorrhagic shock and 28 females were died due to same that means 87 % of victims died due to that. (Table 5)

Table 1:

Age groups	Male	Female	Total
0-10	2	1	3
11-20	09	04	13
21-30	83	10	93
31-40	34	09	43
41-50	16	06	22
>50	08	02	10
	152	32	184

Table 2:

Type of violence	Male	Female	Total
RTA	111	23	134
Assault	28	6	34
Fall from height	10	2	12
Industrial	2	1	3
Others	1	0	1
	152	32	184

Table 3:

Period of survival	Male	Female	Total
0-1 hr	38	10	48
1-6 hr	62	08	70
6-12	30	04	34
12-24	12	4	16
1-2 days	05	03	08
2-7 days	03	02	05
More than 7 days	02	01	03
	152	32	184

Table 4:

Abdominal organs involved	Number of victims
Stomach	10
Omentum	04
Intestine	57
Mesenteries	13
Liver	64
Spleen	33
Kidney	15
Uterus	0
Pancreas	0

Table 5:

Mechanism of death	Male	Female	Total
Shock neurogenic	15	01	16
Hemorrhagic shock	132	28	160
Infection and others	05	03	08
	152	32	184

Discussion

The most likely person who is having an abdominal trauma is healthy young adult. Out of 184 cases 136 were in age group of 21-40. It is similar to study occurred in 2013 by Naik et al¹⁴ & Sugatha et al 2019.¹⁵ As we know this age groups persons are more active socially and physically, so they are more vulnerable for having these injuries. Numbers of case below 10 years and above 50 years is less because they used to remain indoors only. Male victims are more in numbers (152) as comparison with female (32); which is similar to Naik et al¹⁴ & Sugatha et al 2019¹⁵, it is due to that exposure of males are more he used to be more attributed to their work outside home and males in India having dominance with outstanding features as we know. Period of survival is important comparison as in this study we found that most of the victims died due within 1-6 hours after incidence as they are about 50 % of total study done by Naik et al¹⁴ also said that death of victims died within 6 hours of incidence in their study. It may be due to that organs of abdomen contains so much importance as far as concern to blood, with poor timely attend facility of the patient in Indian scenario. Most of the victims met with RTA and having abdominal injuries about 72 % died due to that followed by assault in both sex. As per study done by Naik et al¹⁴ they observed 63% had Road traffic accident. Due to industrial incidence least persons died, it is almost 1.64%. As far as concern with organ involved, it is found that Liver is the most common organ followed by intestine and thereafter spleen. Liver involved in 64 cases and intestine involved in 57 cases and spleen involved in 33 cases. The similar findings observed by Naik et al, 35% cases found liver injury followed by intestine about 31%. It means all study showed that parenchymatous organ is common having injury, which may be due to that liver is easily available for trauma. Involvement of uterus in female and pancreases is least as we know uterus is strongly protected in pelvic cavity and pancreas is behind the liver and other organs. Hemorrhage is more common with parenchymatous injury where death was occurred, which is similar to Naik et al and Sugatha et al.^{14,15} The cause is easily approachable organs.

Conclusion

Majority of the victims were male with age group of 21-30 years. The most frequently noted cause of blunt injury abdomen was Road traffic accidents followed by assault. The incidence of death was within 1-6 hours after sustaining trauma. In commonly injured organ liver topped the list, followed by intestine and spleen. The mechanism involved was found to be hemorrhage due to which most of the death occurs. It means better management needed in case of road traffic accident with in minimal time. More protective method needed with lots of training.

Source of funding

None.

Conflict of interest

None.

References

1. Burke MP. Forensic medical investigation of motor vehicle incidents 1st edition New York Taylor and Francis, 2007
2. Saukko P, Knight B, Knight's pathology 3rd edition. New York: Oxford University press 2002.
3. Jaising P Modi. Regional injuries in: K Mathiharan, Amit K Patnaik Editors. Modi medical Jurisprudence and toxicology 24th ed Nexis butter worth's 2007
4. Manson JK. The pathology of Trauma 3rd edition Arnold: London 2000
5. Lester Adelson M.D. the pathology of homicide. Homicide by Blunt violence, Charles C Thomas. Publisher, Springfield.
6. Nandy A. Principles of Forensic Medicine, 2003 Edition, New Central Book Agency (P) Ltd
7. A Keith Mant. Taylor's principles and practice of medical Jurisprudence wounds. Blunt injury to abdomen.
8. Jogn Glaster. Glaister's Medical Jurisprudence and toxicology, 10th ed, Williams and Wikins; 2006
9. Morgan Vance, Milton Helpem, Thomas A Gonzales, Charles J. Umberger. Legal Medicine: Pathology and Toxicology, Abdominal injuries, 2nd ed Appleton Century- crofts; 2006
10. Rezek Millard. Autopsy Pathology, Abdominal cavity, 15 th edition Thomas
11. K. S. Naryan Reddy. Essential of Forensic Medicine and Toxicology, 26th ed, Medical book company; Hyderabaad; 2010
12. Francis E Cramps. Practical Forensic Medicine, wounds sequelae and complication, 2nd ed, Hutchison Medical; 2010
13. Cyril Jhon polon7 D.J>Ghee. The essential of forensic Medicine Injuries of specific region. 4th Edition. Pergamon Press Oxford; Newyork, Sydney.
14. Naik BV, Jakkam S. Blunt injuries of abdomem in Warangal area: An analytical study. *JIAFM* 2013;35(4):328-31.
15. Sugatha M, Kumar K. Assessment of forensic autopies due to blunt injury abdomen among the patients admitted to the hospital: A retrospective study. *ICJMR* 2019, 6(4): D4-7.

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