Original Article

Indian Journal of Forensic Medicine and Pathology
Volume 11 Number 2, April - June 2018
DOI: http://dx.doi.org/10.21088/ijfmp.0974.3383.11218.4

Profile of Blunt Injuries over Chest: An Autopsy Study

Alpesh B. Bambhaniya[1], Rahul A. Mehta[2]

Abstract

Background: Out of three vital organ two (Heart and Lung) are in the thoracic cavity. So injuries to chest cavity are mostly fatal in the form of haemorrhagic shock or neurogenic shock. Blunt or sharp objects may causes these type of injuries. *Aims:* To study the epidemiological aspect of fatal blunt chest injuries. *Material And Method:* In this study 120 cases of chest injuries by blunt objects are studied for their various aspect. *Results:* Most cases are of road traffic accident (RTA). Most of them are young male between 20-40 years of age. Though majority of them died within in 1hrs, on the spot or on the way. Nature of injuries are correlated with the history and incident. Involvement od lung shows multiple rib fractures. Heart, major vessels and diaphragm were also involved in significant number of cases. *Conclusion:* Most of the fatal blunt chest injuries were of road traffic accidents majority of them have lungs and ribs injuries and hemorrhagic shock is the cause of death in almost all cases.

Keywords: RTA; Fracture; Spot Death; Haemorrhagic Shock.

Introduction

Routinely fatal blunt injuries seen over head, chest and abdomen. Blunt injuries are in the form of abrasion, contusion, laceration or fracture, they are mostly seen in road traffic accident. Many times thoracic damage occurs without any external visible injuries and diagnosed only during meticulous internal examination [1-4].

Run-over accidents and fall from a height can leads to multiple fractures of ribs on either sides. Hitting by hard and blunt object also cause fracture of the ribs and sometimes the fractured ends may penetrate the lung or heart. Sternum is usually fractured by direct impact especially in RTA [4,5].

Here in this study the epidemiological aspects of blunt chest injuries are studied in the cases brought to the autopsy room of the Department of Forensic Medicine Shri M.P. Shah Govt. Medical College, Jamnagar during the period of January 2015 to December 2015.

Author's Affiliation: [1]Assiatant Professor [2]Associate Professor, Department of Forensic Medicine, M.P. Shah Govt. Medical College, Jamnagar, Gujarat 361008, India.

Corresponding Author: Rahul A. Mehta, Associate Professor, Department of Forensic Medicine, M.P. Shah Govt. Medical College, Jamnagar, Gujarat 361008, India.

E-mail: rahul_mehta626@yahoo.com

Received on 19.03.2018, **Accepted on** 11.04.2018

Material and Methods

The materials for the present study were the dead body of blunt chest injuries brought to autopsy room of the Department of Forensic Medicine Shri M.P.Shah Govt. Medical College, Jamnagar during the period of January 2015 to December 2015.

Exclusion criteria are those cases of skeletonised body, decomposed and cause of death is other than chest injury. All the information related to epidemiological aspect of the cases like incident, type of vehicle, treatment taken or not, survival period etc were collected from the close relatives, and police officer accompanying the dead body and also from the police papers.

Detail external and internal injuries were noted and tabulated according to the type of injury, involvement of thoracic organ and cause of death.

Observation & Results

120 cases of blunt chest injuries are studied of which majority of the victims (35.8%) are young adult male between 21-40 year of age group. Age-wise the maximum number i.e., 31 (25.8%) of the victims were from 21-30 years of age, followed by 31-40 and 41-50 years of age group

i.e., 25% & 16.6% cases respectively. At the extreme of age cases were few. Sex-wise there is a clear predominance of male over female i.e., 96 (80%) & 24 (20%) cases respectively.

More than half (61.6%) of the victims were died on the spot just after the incidence. Another 28 (23.3%) were died within 6 hours. Only 4 (3.3%) of the victims survived more than 24 hrs.

Among blunt chest injuries 80.8% are caused by road traffic accidents, of which 2/3 (65.8%) by direct impact of the vehicle. Other blunt chest injuries are caused by, fall from height (11.6%) and by blunt weapon (2.5%) in homicidal assault.

Injuries are caused externally front of chest in 51.6% and mostly on left side in 24.1% Back of chest involved in 27.5% cases and both front and back seen in 20.8% cases. Least cases seen on right back (7.5%) Internally lungs injured in all 120 and heart in 64 (53.3%) cases. Only both lungs are involved in 29.1% of cases and Both lungs and heart involved in 20% of cases. Associated Aortic and pulmonary injury seen in 5% of cases and diaphragmatic injury seen in 5.8% of cases.

Amongst heart injuries right ventricle was involved more often (32.8%) than other parts of heart. Left ventricle alone in 15 (23.4%) while whole heart was found lacerated in 4 (6.2%) of the cases. Haemorrhage and shock was the cause of death in most of the cases.

Table 1: Age and Sex wise distribution:

Age	Male		Female		Total	
1-10	7	5.8 %	0	0%	7	5.8%
11-20	10	8.3%	2	1.6%	12	10%
21-30	21	17.5%	10	8.3%	31	25.8%
31-40	22	18.3%	8	6.6%	30	25%
41-50	18	15%	2	1.6%	20	16.6%
51-60	10	8.3%	1	0.8%	11	9.1%
61-70	5	4.1%	1	0.8%	6	5%
Above 70	3	2.5%	0	0%	3	2.5%
Total	96	80%	24	20%	120	100%

Table 2: Manner of injuries

Sr. No.	Manner	No. of cases	No. of Cases (%)
1.	RTA	97	80.8%
	Impact	79	65.8%
	Run over	18	15%
2.	Fall from Height	14	11.6%
3.	Fall of object (Wall or any)	6	5%
4.	Blunt Weapon (Homicidal)	3	2.5%
	Total	120	100%

Discussion

Mordenization leads to increase in the transportation which leads to increase in road traffic accidents and it is the cause for most of blunt injuries and it is a leading cause of death in autopsy.

Increase industrialization leads to increase in industrial injury in which most of them are of blunt

Table 3: Survival Period

Sr. No.	Period	No. of cases	No. of Cases (%)
1.	Spot Death	74	61.6%
2.	Less than 1hr	18	15%
3.	1hr to 6hr	10	8.3%
4.	6hrs to 12hrs	6	5%
5	12hrs to 24 hrs	8	6.6%
6	More than 24 hrs	4	3.3%
	Total	120	100%

Table 4: Involved areas (External Examination)

Sr. No.	Type of injury	No. of cases	No. of Cases (%)
1	Front of chest	62	51.6%
	Right	14	11.6%
	Left	29	24.1%
	Both	19	15.8%
2	Back of chest	33	27.5%
	Right	9	7.5%
	Left	18	15%
	Both	6	5%
3	Front & Back	25	20.8%
	Total	120	100%

Table 5: Involved areas (Internal Examination)

Sr. No.	Involved Organ	No. of cases	No. of Cases (%)
1	Right lung	9	7.5%
2	Left lung	12	10%
3	Both lungs	35	29.1%
4	Only Heart	0	0%
5	Heart & left lung	27	22.5%
6	Heart and both Lungs	24	20%
7	Heart , Lungs & Major Vessels (Aorta/ Pulmonary)	6	5%
8	Heart, Lungs and Diaphragm	7	5.8%
	Total	120	100%

Table 6: Involved areas of Heart

Sr. No.	Part	RTA		Other		No. of Cases	
1	Right Ventricle	20	31.5%	1	1.5%	21	32.8%
2	Left Ventricle	13	20.3%	2	3.1%	15	23.4%
3	Both Ventricle	8	12.4%	2	3.1%	10	15.6%
4	Right Atrium	0	0%	0	0%	0	0%
5	Left Atrium	0	0%	0	0%	0	0%
6	Both Atrium	1	1.5%	1	1.5%	2	3%
7	Right Side of Heart	4	6.2%	1	1.5%	5	7.7%
8	Left side of Heart	6	9.3%	1	1.5%	7	10.9%
9	Whole heart	3	4.7%	1	1.5%	4	6.2%
	Total	55	85%	9	15%	64	100%

injury. Some of cases of blunt trauma on chest are also seen in quarrel between persons or group with the hard and blunt objects.

In this study shows majority of the victims are young adult males, rarely seen in children, mostly RTA and accidental is the main cause behind such deaths. This is similar to the observations made by other study [1,5].

In RTA direct impact by the vehicle is most common cause of blunt trauma to the chest. [6,7,8,11,12,14]. Injuries to ribs were found fractured in almost all the cases, of which 3rd to 6th ribs were most often involved. This is also consistent with the observations made by the other study [2,8,13,14]. Majority of cases shows fatal lung injuries and other injuries are seen in few of the cases this is also consistent with almost all study. In the cases where heart was involved the right ventricle was most commonly injured. This is consistent with other studies [7,10,14].

Conclusion

- More than 50% of chest injuries were adult males between 21-40 years of age.
- More than 70% of the victims is of RTA most of them are of impact injuries.
- Fracture of ribs were seen in almost all cases, of which 3rd to 6th ribs were most often involved.
- Lungs were involved in all the cases followed by both lungs and heart, aorta and diaphragm were least involved.
- In the cases where heart was involved; right ventricle followed by left ventricle was most commonly injured.
- More than 75% of the victim died either on spot or within 6hrs. in the way or in casualty.
- Almost all cases haemorrhagic shock was the cause of death.

References

1. Reddy KSN. The Essentials of Forensic Medicine and Toxicology. 29th ed. Hyderabad: K. Suguna Devi; 2010.101-103,136.
2. Saukko P, Knight B. Knight's Forensic Pathology. 3rd ed.London: Arnold; 2004.p.229.
3. Modi JP. Modi's medical jurisprudence & toxicology. 22nd edition. New Delhi: Lexis Nexis Butterworth; 2004.p.424-35.
4. Park K. Park's Texbook of Preventive and Social Medicine. 17th ed.Jabalpur: Banarasidas Bhanot; 2002.pp.273-282.
5. Meera Th, Nabachandra H. A study of pattern and injury severity score in blunt thoraco-abdominal trauma cases in Manipal, j. medicolegal update 2005;5(2):47-52.
6. Polson C J, Gee D J, Knight B. The essentials of Forensic Medicine. 4th edition. UK: Pergamon Press; 1995.p.462-70.
7. Dikshit P C. Text book of Forensic Medicine & toxicology.1st edition. New Delhi: PEEPEE publishers & distributors (P) Ltd; 2007.p.215-18.
8. Benerjee K K, Agarwal B.B.L and Kohli. Study of thoraco-abdominal injuries in fatal road traffic accidents in North east Delhi. J Indian Acad Forensic Med. 1997;4(1):40-43.
9. A delson L. The pathology of homicide.1st edition. USA: Charles Thomas; 1974.p.437.
10. Umadethan B. Forensic Medicine. 1st edition. New Delhi: CBS Publishers & Distributors Pvt Ltd; 2011.p.183.
11. Pathak A. Profile of Road Traffic Accidents & Head Injury in Jaipur (Rajasthan), JIAFM. 2007;30(1):6-9.

12. Kumar S, Suresh B, Kanchan T, Ritesh G, Shankar M, Bakkannavar, Vinod C, Nayak K, Yoganarasimha. Victim Profile and Pattern of Thoraco-Abdominal Injuries Sustained in Fatal Road Traffic Accident. JIAFM 2012;34(1):16-19.
13. Ghangale AL. Blunt thoracic trauma in vehicular road accidents. JFMT. 2003;20(2):45-48.
14. Singh PK, Slong D, Devi M. Pattern of Road Traffic Accidents in Imphal. J Indian Acad Forensic Med. 2012;34(4);301-03.