

## A PROSPECTIVE AUTOPSY STUDY OF CHEST INJURIES BY BLUNT TRAUMA

Fairoz Khan<sup>1</sup>, Shobhana S. S<sup>2</sup>, Sudhamshu Raj Sharma<sup>3</sup>

### HOW TO CITE THIS ARTICLE:

Fairoz Khan, Shobhana S. S, Sudhamshu Raj Sharma. "A Prospective Autopsy Study of Chest Injuries by Blunt Trauma". Journal of Evidence based Medicine and Healthcare; Volume 2, Issue 3, January 19, 2015; Page: 212-218.

**ABSTRACT:** 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. In urban life 75% of thoracic trauma follows blunt injury. Greatest difficulty in their management lies in the timely diagnosis. This is largely due to masking of thoracic trauma by associated injuries like head injury, abdominal trauma and bony injury. In Bangalore, vehicular accidents are one of the most common contributory factors to the chest trauma because of multiplicity of vehicles

**KEYWORDS:** blunt trauma, chest injuries, preventable cause.

**INTRODUCTION:** The history of trauma dates back right down to the time of evolution of human kind. Since prehistoric times, the chest 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 lung and heart.

With fast moving vehicular traffic, vast urbanization, rapid industrialization, changing social patterns, construction of sky scrapers and increased crime rate with added activity of terrorists, have contributed vary greatly to the increase in the incidence of trauma to the human body.<sup>1</sup>

During 1990's Road Traffic Accidents ranked 9<sup>th</sup> among the leading causes of death in the World. It was projected that, if the same trend continued it would become the 3<sup>rd</sup> leading cause by the year 2020.<sup>2</sup>

Since the chest cavity contains the vital organs like lung, heart, great vessels and various tubes 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. Even with the improvement in safety measures in vehicles and greater availability of state of art resuscitative measures, the mortality rate in crush injuries to the chest region has not declined.

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. Despite significant social impact of trauma, few reliable epidemiological data are available for the trauma caused by blunt mechanisms in India. Hence, we in the Department of Forensic Medicine, Vydehi institute of medical sciences and research Centre, Bangalore have undertaken to do autopsy study of blunt trauma to chest occurring in this part of Bangalore and those cases where chest injuries had resulted in death of individual.

# ORIGINAL ARTICLE

## OBJECTIVES OF THE STUDY:

1. The objectives of the study is to find out the pattern of blunt thoracic trauma as regards to the sex ratio, the type of blunt trauma, survival period and cause of death in victims.
2. To assess type of chest injuries incompatible with life.

## MATERIALS & METHODS:

**SOURCE OF DATA:** Data was collected from the 64 cases of blunt thoracic trauma that are brought for medico-legal autopsy at the mortuary of Forensic Medicine Department, Vydehi Institute of Medical Sciences and Research Centre, Bangalore, during the period from December 2008 to May 2010.

The epidemiological features pertaining to victim e.g. age, sex, type of trauma, type of road users, type of vehicle involved in the accident and injuries caused to the victims, and other relevant data about the cases will be collected from the papers sent by the police namely Inquest report of Karnataka police [form number 146 (i) and 146(ii)] and details from concerned police constables, investigation officers and authorities, witnesses of the incident, relatives, attendants, friends and others accompanying the dead body. A detailed Proforma for the purpose of recording history and epidemiological data. All the dead bodies were thoroughly examined for external and internal injuries including bones and joints in thoracic region.

Statistical tests done are percentage, proportion and standard error of proportion.

## The criteria for selection of cases for this study were as follows:

1. All the cases showing fatal thoracic injuries caused by blunt force with or without external injuries, and those cases who succumb after treatment at Vydehi institute of medical sciences and research Centre and hospital are also included. In hospital are considered for this study.
2. Decomposed bodies and those cases where the nature of sustenance of injury is not known are not included in this study.

**RESULTS:** The present study was conducted during the period December 2008 to June 2010 brought for post mortem examination at VIMS & RC, Bangalore with chest injuries.

| Incidences             | No. Of Cases     |
|------------------------|------------------|
| Road traffic accidents | 49 cases (76.6%) |
| Fall from height       | 09cases (14.1%)  |
| Assault                | 4 cases (6.2%)   |
| Other (fall of object) | 02 cases (3.1)   |

Table 1

| Age of victim | No Of Cases |
|---------------|-------------|
| 0-10years     | 05(7.8%)    |
| 11-20years    | 02(3.1%)    |

# ORIGINAL ARTICLE

|            |           |
|------------|-----------|
| 21-30years | 30(46.9%) |
| 31-40years | 13(20.3%) |
| 41-50years | 08(12.5%) |
| 51-60years | 04(6.25%) |
| >60years   | 02(3.15%) |

Table 2

| Sex Ratio | No. Of cases |
|-----------|--------------|
| Male      | 55(85.9%)    |
| Female    | 09(14.1%)    |

Table 3

| Most common among RTA | No. Of cases |
|-----------------------|--------------|
| Motor bikes           | 33(67.3%)    |
| Pedestrians           | 10(20.4%)    |
| Others                | 06(12.3%)    |

Table 4

| Survival period in hours | No. Of cases |
|--------------------------|--------------|
| <6hours                  | 51(73.7%)    |
| 6-12hours                | 06(09.3%)    |
| 12-18hours               | 01(01.6%)    |
| 18-24hours               | 01(01.6%)    |
| >24hours                 | 05(7.8%)     |

Table 5

| Parts of the body involved               | No. Of cases |
|------------------------------------------|--------------|
| Chest alone                              | 02(3.1%)     |
| Chest and adjacent part of head and neck | 17(26.6%)    |
| Chest and adjacent part of abdomen       | 08(12.5%)    |
| Combined                                 | 37(57.8%)    |

Table 6

| Bones fractured | No. Of cases |
|-----------------|--------------|
| Ribs            | 28(43.7%)    |
| Clavicle        | 02(3.2%)     |
| Sternum         | 05(7.8%)     |

# ORIGINAL ARTICLE

|                               |           |
|-------------------------------|-----------|
| Vertebra                      | 07(10.9%) |
| Combined (more than one bone) | 22(34.4%) |

Table 7

| Type of organ involved         | No. Of cases |
|--------------------------------|--------------|
| Lungs                          | 25(39.1%)    |
| Heart                          | 02(3.1%)     |
| Major vessels of chest         | 01(1.5%)     |
| Combined (more than one organ) | 36(56.3%)    |

Table 8

| Cause of death      | No. Of cases |
|---------------------|--------------|
| Asphyxia            | 03(4.7%)     |
| Shock & haemorrhage | 56(87.5%)    |
| Coma                | 03(4.7%)     |
| Septicaemia shock   | 02(3.1%)     |
| Combined            | 00(0%)       |

Table 9

**DISCUSSION:** The results of our study on the fatal chest injury due to blunt force were analyzed and compared with other studies conducted at various places in India and abroad. While comparing the results of our study with other workers, many factors were taken into consideration.

Firstly, this study was conducted at Bangalore and it included by and large the population of eastern part of Bangalore and surrounding places. Vydehi Hospital (VIMS& RC) is a General Hospital where in cases are referred from many health centers. Hence, this study included victims of blunt chest trauma, which were autopsied at the mortuary of VIMS & RC.

According to this study RTA was the commonest cause for blunt chest trauma which was in accordance with the study conducted by Robert M. Shorr,<sup>3</sup> Raju S Iyer,<sup>4</sup> Serife Tuba Liman,<sup>5</sup> N. Ali<sup>6</sup> and Pathak Manoj Kumar.<sup>7</sup>

In the present study the maximum number of blunt chest injury occurred between the age group of 21 – 30 years, followed by age group 31 – 40 years. Similar results were observed in the previous studies conducted by Raju S Iyer,<sup>4</sup> A.L. Ghangale,<sup>8</sup> R.V. Kachre,<sup>9</sup> D.Harish,<sup>10</sup> Harnam Singh,<sup>11</sup> and Pathak Manoj Kumar<sup>7</sup> the reason being that young adults are prime bread earners of the family and remain out doors during most of the day, while persons in extremes of age group remain indoors.

Male dominance is explained by the fact that, males are more exposed to hazards of road, industry and violence they are the working and earning members in majority of families, while

# ORIGINAL ARTICLE

---

females usually stay indoors and look after the household work in India. Similar results were observed in studies conducted by Robert M. Shorr,<sup>3</sup> Serife Tuba Liman,<sup>5</sup> D.Harish,<sup>10</sup> N. Ali.<sup>6</sup>

From the study population in RTA it was observed that motor cyclists accounted for 30 cases (61.2%) formed the major part of victims of blunt chest injury followed by pedestrians 10 cases (20.4%). Similar results were observed in the studies conducted by Ganveer GB,<sup>11</sup> Pathak Manoj<sup>7</sup> and Srinivasulu Pothireddy<sup>12</sup> on road traffic accidents.

In the present study we observed that victims had 28 cases (43.7%) rib fracture, followed by combined bony fractures 22 cases (34.4%) which is in accordance with the study conducted by Robert M. Shorr,<sup>3</sup> Raju S Iyer,<sup>4</sup> A.L. Ghangale,<sup>8</sup> Dr T.H. Meera<sup>13</sup> and Pathak Manoj.<sup>7</sup> This could be as ribs are most exposed bone to trauma as they are spread over large area.

In the present study it was observed that Shock and hemorrhage was seen in 56 cases (87.5%) followed by asphyxia and coma 03 cases (4.7%) but it is in contrast to study done by Dr. Archana Kual<sup>14</sup> and Meera T.H.<sup>13</sup>

In our study it was observed that combination of different parts of body involvement is maximum 37cases (57.8%), followed by Chest and adjacent parts of head and neck 17 cases (26.6%), and chest alone is involved in 2 cases (3.1%). Robert M. Shorr, Zarza<sup>11</sup>, A. L. Ghangale, Dr. Harnam Singh, Dr. ArchanaKaul and Sarah L Lathop. Chest and adjacent parts of head and neck are involved in most cases.

**CONCLUSION:** The following conclusions were drawn after a detailed study of 64 cases of deaths due to blunt injury to chest at Vydehi Institute of Medical Sciences and Research Centre, mortuary, Bangalore.

- In the victims of blunt injury to chest 76.6% were due to RTA, 14.1% due to fall from height and 9.3% were due to other incidence.
- Majority of the victims were aged between 21-40 years (67.2%).
- Males comprised the majority of victims as compared to females in the ratio 6.1:1.
- Most of the victims died on spot or within 6 hours of the incident (79.6%).
- Motor cyclists (61.2%) were the commonest victims involved in the study cases of RTA.
- Most of the cases had injuries in combination of different parts of body (57.8%), current study concentrated on fatal chest injuries.
- In bony injuries fracture of ribs was common. (43.7%).
- Most of the cases had combination of injury to more than one organ (56.3%) of chest.
- Shock and haemorrhage was the commonest cause of death (87.5%) which was involving the internal organs of chest regions.
- The cases in the current study was taken exclusively involving chest trauma which has resulted in death of the individual, injuries sustained to other organs are minor and had not been included in the current study.
- The study helps in determining the importance of the thoracic region and the vital organs present in the region, protection is also required to prevent thoracic region, like the head region where there is use of helmet to protect vital organ.
- Work place injuries are also common entity which can also be prevented by giving protective gars in the same.

## REFERENCES:

1. Hogarth J, Glossary of Health care terminology, WHO, Copenhagen 1978. Accessed on 21/12/14.
2. The World Health Report 1995, Report of the Director General WHO 1995. Accessed on 21/12/14.
3. Robert M. Shorr, Michael Crittenden, Matthew Indeck, Susan L. Hartunian, and Aurelio Rodriguez. Blunt Thoracic Trauma Analysis Of 515 Patients. Ann. Surg. August 1987, Vol. 206 No. 2; P 199- 204. Assessed on 21/12/14.
4. Raju S Iyer, Padmanabhan Manoj, Rajnish Jain, Prasad Venkatesh,,Dronamraju Dilip, Profile of Chest Trauma in a Referral Hospital: A Five-Year Experience. Asian Cardiovasc Thorac Ann 1999; 7: 124-127.
5. Serife Tuba Liman, Akin Kuzucu, Abdullah Irfan Tastepe, Gulay Neslihan Ulasan, Salih Topcu Chest injury due to blunt trauma. Eur J Cardiothorac Surg 2003; 23: 374-378.
6. N. Ali and B. M. Gali Pattern and management of chest injuries in maiduguri, nigeria, Annals of African Medicine; 2004; Vol. 3, No. 4: 181 – 184.
7. Pathak Manoj Kumar, Ahamad Ziya, Agrawal Prashant, Yadav Sudhir, Chaturvedi Rajesh, Tripathi S K, Victims of Varanasi and Adjoining Districts, U.P. JIAFM, Vol. 6, No. 3.
8. A.L. Ghangale; Blunt thoracic trauma in vehicular accidents; Journal of Forensic Medicine and Toxicology, 2003; vol-20, no-2, p-45-49.
9. R.V. Kachre, V.H.Kachre, S.S.Asawa, pattern of vehicular accidents in Pravara region: A rural region of Ahmadnagar District of Maharastra; Journal of Forensic Medicine and Toxicology, 2003; vol-20, no-2p-29-31.
10. D.Harish, B.R Sharma, Sandeep Kumar, Krishan Vij; Analysis of pelvic fracture in fatal vehicular accidents; Journal of Forensic Medicine and Toxicology, 2004; vol-21, no-1, p-30-33.
11. Ganveer GB, Tiwari RR. Injury pattern among non-fatal road traffic accident cases: A cross-sectional study in Central India. Indian J Med Sci 2005; 59: P-9-12.
12. Srinivasulu Pothireddy, Uday Bhaskar Reddy, Jilumudi; Study of Socio-demographic risk factors in fatal motorcyclist accidents; JSIMLA2010,; vol-2 no-1, p-8-11.
13. Dr T.H. Meera, Dr H. Nabachandra, A postmortem study of blunt cardiac injuries JIAFM, 2005: 27 (2), p 82-84.
14. Dr. ArchanaKaul, Dr. U. S. Singh, Dr. A. K. Kapoor, Dr. Y.K. Pathak, Dr. Susheel Sharma, Dr. Aparajita Sing, Dr. Sanju Singh, An Epidemiological Study of Fatal Road Traffic Accidents in Allahabad region, IIJFMT 2005; 3 (1).

# ORIGINAL ARTICLE

---

## **AUTHORS:**

1. Fairouz Khan
2. Shobhana S. S.
3. Sudhamshu Raj Sharma

## **PARTICULARS OF CONTRIBUTORS:**

1. Assistant Professor, Department of Forensic Medicine, Vydehi Institute of Medical Sciences & Research Centre, Bangalore.
2. Assistant Professor, Department of Forensic Medicine, Vydehi Institute of Medical Sciences & Research Centre, Bangalore.

3. Professor & HOD, Department of Forensic Medicine, Vydehi Institute of Medical Sciences & Research Centre, Bangalore.

## **NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:**

Dr. Shobhana S. S,  
Assistant Professor,  
Department of Forensic Medicine,  
Vydehi Institute of Medical Sciences &  
Research Centre, Bangalore.  
E-mail: shobhana\_mbbs@yahoo.com

Date of Submission: 02/01/2015.  
Date of Peer Review: 03/01/2015.  
Date of Acceptance: 06/01/2015.  
Date of Publishing: 13/01/2015.