

A STUDY TO COMPARE CLINICAL DIAGNOSIS AND AUTOPSY FINDINGS IN TRAUMA FATALITIES

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Abstract

Background: Trauma being a leading cause of death today it is important to find the exact cause of death. Comparing the clinical impression and autopsy findings should equip the trauma surgeon in better managing these patients. **Materials and Methods:** The study aimed at comparing clinically detected injuries and autopsy detected injuries. The fatal cases of trauma were studied and Autopsy findings were correlated. A total of 119 cases were studied. **Results:** In 39.5% of cases studied, clinical and autopsy findings were congruent. In 34.45% of cases, there were marginal discrepancies in detecting injuries. In 26.05%, discrepancies were obvious and potentially fatal. **Conclusion:** From the above study it is found that potentially fatal injuries are missing in trauma. To avoid this we need aggressive evaluation of all trauma patients especially in the area of maximum undetected fatal injuries, there by to improve the management of trauma patients.

INTRODUCTION

Severe injury is the leading cause of death among children, adolescents, and young adults (ages 1-44), and represents the third most common cause of death for all ages after cardiovascular diseases and cancer. Frequent causes of death in trauma fatalities are at first injuries to the central nervous system (40-50%), followed by hemorrhage (20-40%) and multiple organ failure (MOF), accounting for a further 2-10%.

Trauma is recognized as a serious public health problem. Trauma strikes down a society's youngest and potentially most productive members. Now a days injury is considered as disease. An injury affects more than just the injured person; it affects everyone who is involved in the injured person's life.

In the last decades, numerous clinical implementations, scoring systems and guidelines for improving quality of treatment in polytrauma patients such as the Advanced Trauma Life Support-(ATLS)-Programme, Pre hospital trauma life support -(PHTLS) Programme have been set up.

Review of autopsy data is also used as part of process of improving quality of trauma management. Autopsies can uncover some of the hidden injuries that are not accounted during the time of patient management. So by analyzing the autopsy data we can reach in a final conclusion without much uncertainty there by improving our trauma management.

Aims of the Study

The principal aims of conducting this study were

1. To compare clinically detected injuries and injuries detected by autopsy of trauma fatalities admitted in general surgery department of Govt. medical college Thrissur.
2. To find out whether they are congruent or having marginal / obvious discrepancies.
3. If discrepancies are there compare the frequency of different missed injuries.
4. To find out the commonest fatal missed injury that might have caused death of the patient.

MATERIALS AND METHODS

Study Design

Retrospective descriptive study

Study Setting

Department of General surgery, Government medical College, Thrissur.

Department of Forensic medicine, Government medical College, Thrissur

Duration of study

1st April 2012 to 31st March 2013

Subjects

Fatal cases of trauma admitted in general surgery unit of Govt. medical College, Thrissur.

Inclusion Criteria

All trauma fatalities occurred in general surgery unit of Medical College Thrissur from 1st April 2012 to 31st March 2013 were selected.

Exclusion Criteria

- Trauma fatalities that did not have an autopsy performed are excluded.
- Brought dead cases are excluded.
- Patients in the pediatric age group (0-13 yrs)

Methodology

When the patient has expired following a trauma case sheet was collected and the patient details and a short history were recorded. Then the injuries which are detected by clinical examination and by investigations were analysed. After that a cause of death which was detected clinically was identified and recorded.

The autopsy findings and the cause of death by autopsy of the same patient was collected from the department of forensic medicine and they were analyzed and compared to clinical findings.

Ethical Clearance and Conflict Of Interest

Study proposal was cleared by institutional research board prior to beginning of data collection. Expense of study was met by principal researcher. There was no conflict of interests involved.

Analysis of Data

After collection of data Cases are classified into 3 groups- congruent, marginal discrepancies or obvious discrepancies

- Congruent cases are defined as cases where clinical and autopsy findings do not differ.
- Marginal discrepancies are defined as unsuspected or non matching findings at autopsy when compared to clinical records that do not directly contribute to the patient's death but likely would have an impact on the patient's treatment or hospital course.
- Obvious discrepancies are defined as autopsy findings that are clinically unsuspected, incorrect or interpreted differently when compared to the clinical records, the latter present different

Table 1: Comparison of Clinical and Autopsy Findings

Percentage	Frequency	Table 3 Group
39.50%	47	Congruent
34.45%	41	Marginal difference
26.05%	31	Obvious difference
100%	119	Total

Table 2: Injuries Missed by Anatomical Region

Region	No of Injuries missed	Percentage
Head	59	30.26
Neck	10	5.13
Thorax	85	43.59
abdomen	23	11.79
Pelvis	4	2.05
Spine	4	2.05
Long Bone	10	5.13
TOTAL	195	100

Table 3: Missed Fatal Injuries by Region

Region	Number	Percentage
Head	34	44.74
Neck	6	7.89
Chest	22	28.95
Abdomen	10	13.16

pathophysiological pathways contributory to death of the patient.

After analysis of data the percentage of cases having marginal and obvious discrepancies were calculated. Frequency of different missed injuries were also calculated.

Most common missed injuries that might have caused the death of the patient were identified.

RESULTS

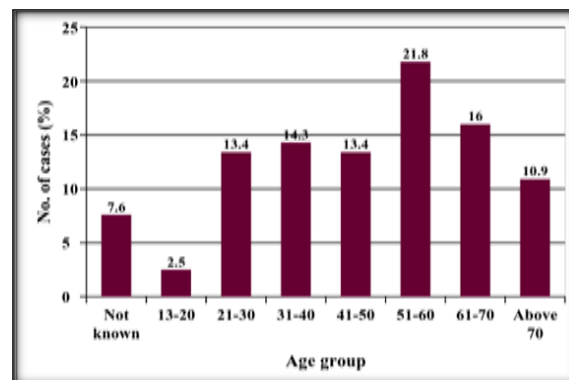


Figure 1: Age Wise Distribution of Trauma Fatalities

Total Number of Cases included in the study was 119. Maximum trauma fatalities was found in age group of 51 – 60 years.

Comparison of Clinical and Autopsy Findings.

After comparison of injuries detected clinically and autopsywise it is found that 39.5% are congruent, 34.45% cases are of marginal difference and 26.05% cases are of having obvious difference.

Pelvis	4	5.26
Total	76	100

Table 4: Frequency of Individual Fatal Missed Injuries in Cases Having Obvious Discrepancy

No of cases in which this injury is missed	Injury missed in cases having obvious difference	
7	SDH	HEAD
6	Brain contusion & hematoma	
10	Brain edema	
1	Brain stem bleed	NECK
6	Cervical spine injury	
5	Hemothorax	THORAX
1	pneumothorax	
1	Collapse lung	
3	Lung contusion	
5	Aspiration & Lung consolidation	
2	Laceration lung	
1	Cardiac contusion	
2	LV laceration	
1	Thoracic aorta rupture	
1	CAD	
8	Liver laceration	
1	Splenic laceration	
1	Retroperitoneal hematoma	
5	Laceration kidney	
3	Si joint # separation	PELVIS
1	Pelvic hematoma	

Table 5: Frequency of Probable Cause of Fatality Undetected In Obvious Cases

NO: OF CASES	PROBABLE CAUSE OF FATALITY UNDETECTED
8	TRAUMATIC BRAIN INJURY ALONE
1	TBI WITH LUNG ASPIRATION
1	TBI WITH LUNG CONTUSION
1	TBI WITH HEMOTHORAX
1	TBI WITH SPINAL CORD INJURY
3	SPINAL CORD INJURY
1	ACUTE CORONARY SYNDROME
2	PELVIC INJURY WITH HEMATOMA
3	LUNG CONTUSION/CONSOLIDATION
2	LEFT VENTRICLE INJURY
2	LIVER LACERATION
6	MULTIPLE-HEAD/SPINAL CORD/CHEST/ABDOMEN
31	TOTAL

Table 6: Survival Time in Three Different Groups

Group	Mean survival time in hours	Standard Error
Congruent	106.06	21.39
Marginal	90.96	18.87
Obvious	75.09	32.24
All cases	92.78	13.50

F = 0.414
P = 0.662

DISCUSSION

21.8% of trauma fatalities belonged to 51-60 years of age, followed by 61-70 year group (16%) [Figure4]

After comparing injuries detected clinically and autopsywise in fatal trauma cases, 39.5% are having congruent findings. 34.45% of cases are of have marginal discrepancies and 26.05% are having obvious discrepancies.[Table 3][Figure6] In cases of marginal discrepancies, injuries were missed clinically, but they did not alter the final outcome of the patient. In obvious cases, missed injuries are the fatal ones causing the death of the patient.

Of all the missed injuries analysed chest injuries formed majority, 43.59% followed by head injury 30.26% [Table2]

After analysis of individual missed injuries in all non congruent cases, it was found that fracture ribs are the commonest ones undetected followed by aspiration and lung contusion and brain edema. Commonest individual abdominal injury missed was liver laceration Of all potentially fatal injuries missed, 44.74% are in head region followed by 28.95% in thorax and 13.16% are in abdomen.[Table3]

The most potentially fatal individual injury clinically undetected in case with obvious discrepancy was brain edema followed by liver laceration. Fatal thoracic injury missed was

aspiration with lung consolidation and hemothorax. In abdomen it was liver laceration. [Table 4]

After analysis of 31 cases with obvious discrepancies, eight patients probably expired due to undetected severe traumatic brain injury alone. [Table 5] 3 patients, expired in emergency room itself before a CT scan was taken. One patient was treated as a blunt trauma abdomen and underwent laparotomy, but had a severe traumatic brain injury in the form of subdural hematoma and multiple brain contusion which was undetected. Another case was evaluated with a CT brain and reported as having no traumatic brain injury, but was detected to have significant brainstem bleed on autopsy. One case was managed as a long bone fracture. CT was not taken in view of good GCS. He suddenly expired and was found to have severe brain edema and subarachnoid hemorrhage. One case managed as having chest injury with tube thoracostomy and endotracheal tube, CT scan was not taken. He expired in emergency room and was found to have multiple brain contusion on autopsy. Another was managed as chest injury with ICD tube, CT was not taken but was found to have severe head injury in autopsy in addition to chest injury.

One among the 31 cases succumbed due to aspiration following head injury. Head injury was detected partially, but aspiration component was clinically undetected. One case was managed as head injury and rib fracture but succumbed due to extensive lung contusion which was undetected. One case was managed as right-sided hemothorax, but had undetected left hemothorax and severe head injury. Another case was treated as chest injury, CT head was reported as normal. On autopsy he was diagnosed as having spinal cord injury, #C1, #C2, atlanto axial dislocation and severe TBI [Table 5]

3 cases among the 31 were found to have succumbed to spinal cord injury which was clinically missed. [Table 8]. One case was diagnosed as head injury and its complication expired suddenly and was found to have acute coronary syndrome in autopsy. [Table 8]

2 among 31 cases had missed pelvic injury [Table 5] One case was managed as head injury alone, but had undiagnosed fracture dislocation sacro iliac joint with massive retroperitoneal hematoma. Another managed as head injury with chest injury suddenly developed hypotension and expired was found to have a missed fracture separation of pubic symphysis with hematoma.

3 among 31 cases are found to have fatal non-detection of contusion lung with consolidation. [Table 5]. One case was managed as head injury but was found to have missed severe right lung contusion.

One case was managed as head injury but autopsically expired due to bilateral severe lung contusion. [Table 5]. Another case managed as head injury, but expired due to undiagnosed bilateral severe lung contusion.

Out of 31 cases, 2 cases expired suddenly due to left ventricle laceration. [Table 5]. One case was managed as suspicious head injury had sudden death in ER was found to have left ventricle laceration. Another was managed as chest injury with bilateral ICD, expired suddenly and autopsy revealed lacerated wound in apex of left ventricle.

2 of 31 cases expired because of missed liver laceration. [Table 5]. One case was on treatment for DAI, suddenly developed hypotension, was managed as ACS, but autopsy revealed multiple liver laceration. Another case was a sudden death in an hour was found to have multiple liver laceration.

6 among the 31 cases, was found to have missed head, neck, chest and abdominal injuries. [Table 5]. One case presented with fracture long bone and suspicious chest injury, suddenly collapsed in ER was managed as left ventricular failure in view of old IHD, expired in 5 hours, but was found to have brain edema, cervical spine injury left ventricle contusion and massive retroperitoneal hematoma on autopsy. 3 other cases expired in emergency room, 2 of them within one hour of presentation.

After analysis of above 31 cases we found that some fatalities are due to injuries missed in specific region and some are due to combination of injuries in different areas. If categorized, it is found that maximum fatalities (8 cases) are due to missing severe traumatic brain injury alone. [Table 5]

After comparing the survival time in 3 groups it was noticed that mean survival of patients with obvious incongruity was 75.09 hours (SE 32.34) were as those with marginal discrepancy was 90.96 hours (SE 18.87), and those with no incongruity 106.06 hours (SE 21.39). But this value was not statistically significant. [Table 6].

CONCLUSION

Majority of trauma fatalities in trauma patients admitted in Department of General Surgery, Government Medical College, Thrissur were males. Mortality is highest in 51-60 year age group.

In 39.5% of cases studied, clinical and autopsy findings were congruent. In 34.45% of cases, there were marginal discrepancies in detecting injuries. In 26.05%, discrepancies were obvious and potentially fatal.

Majority of clinically missed injuries were thoracic injuries. Single most common injury missed was rib fractures.

Most common potentially fatal missed injury were head injuries. Single most common potentially fatal head injury was severe brain edema. No statistically significant difference was detected in survival time in all three groups.

From the above study it is found that potentially fatal injuries are missing in trauma. To avoid this need aggressive evaluation of all trauma patients especially in the area of maximum undetected fatal

injuries; there by to improve the management of trauma patients.

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