



Emergency Treatment of Patients of Thoraco Abdominal Trauma in Surgical Ward According to Advanced Trauma and Life Support (ATLS)

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Authors' contributions

This work was carried out in collaboration among all authors. Author AAL designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors SS, SA, MAS, GAM, GAK and AA managed the analyses of the study and managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Objective: To determine the emergency treatment of Patients of Thoraco abdominal trauma in surgical ward according to Advance trauma and life support (ATLS).

Methodology: Prospective observational study was conducted for two years from April 2018 to March 2020 at Liaquat university of Medical and Health Sciences Jamshoro/Hyderabad Hospital. The study comprises 50 patients. All were admitted from Emergency department. The patients

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were evaluated fully after history & clinical examinations. Results were analyzed by using statistical package for social sciences (SPSS) version 23.

Results: In this study of 50 patients of Thoraco abdominal trauma, the maximum numbers of patients were in age group 15-70 years. Out of 50 patients 25 patients were presented with Trauma in Thorax, in which 5 patients were presented with penetrating injury & 20 patients were presented with Blunt trauma, 10 patients were presented with combine Thoraco abdominal trauma in which 2 patient were presented with penetrating injury & 8 patients were presented with Blunt trauma. Related to chest trauma 10 patients were treated needle thoracotomy with chest intubation, 5 patients were treated endotracheal intubation, 3 patients were treated thoracotomy and 2 patients were treated cardiocentesis, 5 patients were treated cricothyroidotomy. Better out were seen in 45 patients and mortality were seen in 5 patients.

Conclusion: Advance trauma and life support (ATLS) has a vital role in thoraco abdominal trauma intervention. 90% of successful interventions were obtained using advance trauma and life support.

Keywords: Advanced trauma life support; emergency treatment; Thoraco abdominal trauma.

1. INTRODUCTION

Thoraco abdominal trauma is a common traumatic injury all over the world. Traumatic injury not asses and manage properly patients can die within seconds, minutes and hours. Thoracic trauma is one of the lethal injury patients having simple or tension pneumothorax, or open pneumothorax, hem thorax, flail chest, tracheobronchial injury, blunt esophageal rupture, pulmonary contusion, diaphragmatic injury, aortic injury and cardiac tamponed [1]. Thoracic trauma associated with or without abdominal trauma either blunt, penetrating involve the spleen, liver, intestine, kidney, pan crease and bladder injuries. Traumatic patient can present with other injuries i-e Head injuries, spinal cord injuries, musculoskeletal injuries, pelvic bone fracture. Injured patient can presented with altered Glasgow coma scale (GCS) Normal GCS 15/15. Airway obstruction upper or lower air way obstruction, hypoxia, hypercarbia acidosis, breathing problems, chest pain, respiratory distress, tachycardia, hypotension, neck vein distention, bleeding, skin color, tachypnea, muffled heart sounds, oliguria. Hypothermia or hyperthermia [2]. Whatever type of injury patient can manage According to Advanced trauma & life support protocol making a plan of resuscitation before hospital, in hospital. Required equipment's are laryngoscope and tubes, stethoscope, sphangomanometer, pulse oximeter, urinary catheter, nasogastric tube IV cannula, Crystalloid and colloid fluid, injection of tetanus [3]. Examiner apply role of triage means sort out patient based on their injury, identify injured and dead casualties on the basis of voice. Please raise the hand who receiving the voice. Start Primary survey airway, breathing, circulation, disability & exposure.

Maintenance air way with cervical spine protection, breathing and ventilation, circulation with hemorrhage control, disability neurologic status and exposure environmental control. Resuscitation, adjuncts to primary survey and resuscitation, consider the need of patient transfer [4]. Secondary survey head-to-toe evaluation and patient history, allergies, medications currently used, past illness /pregnancy, last meal and events environment related to history, adjuncts to the secondary survey, continued post resuscitation monitoring, reevaluation and definitive care. Management based on advanced trauma & life support protocol. Principals guide lines, assessment, resuscitation and judgment necessary for definitive procedure. General survey, conscious ness, blood pressure, pulse rate, respiratory rate, pattern of breathing, movement of chest, chest percussion note ,breath sounds, neck veins , abdominal bruise & distention , superficial and deep tender ness, rectal, vaginal, and urethral examination. Secondary survey, level of consciousness, pupillary size and response, lateralizing sign need of necessary investigations [5]. X-Ray cervical spine, X -ray chest, abdomen, pelvis and long bones and joints, (FAST) focused assessment sonographey in trauma of chest, abdomen and pelvis pulse oximetry, arterial blood gases, electrocardiogram, echocardiography, Computed Tomography, chest and abdomen, diagnostic peritoneal lavage, magnetic resonance image of chest and abdomen, bronchoscopy uretherogram [6] cystoscopy thoracoscopy, laparoscopy. Then send necessary investigation in emergency department before or after life saving procedure, blood complete picture, blood urea, blood sugar, serum electrolyte HBSAG, HCV, HIV, COVID 19, blood grouping, liver function test, prothermobin

time, activated partial thromboplastin time international normalized ratio INR. Indication of life saving procedure according to primary survey correct the upper airway with cervical spine protection, remove the foreign bodies, patients need endotracheal intubation before intubation. Assessment for difficult intubation i.e. look externally, evaluate the rule 3-3-2, of Mallampati, obstruction and neck mobility. Chin lift maneuver, jaw thrust maneuver, oropharyngeal airway, endotracheal intubation, needle cricothyroidotomy, surgical cricothyroidotomy correct the breathing problem, needle thoracocentesis, chest intubation, three sided dressing in case of open pneumothorax, pericardiocentesis in case of cardiac tamponade [7]. Correct circulation pass wide bore I v cannula, cut down tube, central venous pressure line, intraosseous puncture, restore blood volume according to estimated blood loss less than 750 to 1500 ml, more than 1500 to 2000 ml blood loss, transfused crystalloid and colloid fluid, blood, fresh frozen plasma. If patient is stable keep under observation. If patient is unstable needs surgical interventions: Shift the patient in trauma center with coordination of trauma team. Treat according to systemic involvement. Try to avoid life threatening complications, hypothermia, acidosis, disseminated intravascular coagulation, Systemic inflammatory response syndrome, multiple organ dysfunction syndrome and multiple organ dysfunction failure [8].

Objective of this study is to determine the emergency treatment of Patients of Thoraco abdominal trauma in surgical ward according to Advance trauma and life support (ATLS).

2. METHODOLOGY

It was a prospective study carried out of surgical emergency department and surgical ward of Liaquat University of medical & health sciences Hyderabad / Jamshoro May 2018 to April 2020. The study comprises 50 patients. All patients were admitted from Emergency department. Patients were fully evaluated & Assessed on the protocol of ATLS includes preparation of plan of pre hospital trauma life support (PHTLS) and hospital phase need of American college of surgeons committee on trauma, a triage, primary survey airway, breathing, circulation, disability, and environment. Secondary survey (History and Head-to-toe evaluation emergency resuscitation

and specific investigation were taken. If patient stable x-ray cervical spine, chest Thoracic spine, Lumbosacral spine and pelvis. FAST of chest abdomen, CT chest and abdomen. MRI chest, Diagnostic peritoneal lavage, ECG Echocardiography, Thoracoscopy, bronchoscopy, urethrogram, Cystoscopy, Laparoscopy, Arterial blood gases ABGS, complete blood picture, blood sugar, blood urea, serum creatinine liver function test, Prothromboplastin time PT, Activated partial thromboplastin time (APTT), International normalized ratio INR. Evaluated patients were evaluated fully after history, Clinical examinations & specific investigations and treatment options were recorded on a preform designed for the study. Statistical package for social sciences SPSS version 23 was used for statistical analysis of the data.

3. RESULTS

This was a hospital based case series study of 50 patients of Thoraco abdominal trauma, the maximum number of patients were in age group 15-70 years. 25 patients belong to age groups 15 to 40 years, 13 patients were in age groups 41 to 55 years, 12 patients were in age groups 56 to 70 years (Table 1). Out of 50 patients 25 patients were presented with thoracic trauma. In which 5 patients presented with penetrating injury & 20 patients were presented with blunt chest trauma, 10 patients were presented with combined Thoracoabdominal trauma. In which 2 patients were presented with penetrating injury & 8 patients were presented with blunt trauma, 15 patients were presented with abdominal trauma. In which 3 patients were presented with penetrating injury & 12 patients were presented with blunt trauma (Table 2). Related chest trauma. 10 patients were treated by needle thoracotomy with chest intubation, 5 patients were treated with cricothyroidotomy, 5 patients were treated with endotracheal intubation, 3 patients were treated with thoracotomy and 2 patients were treated with pericardiocentesis (Table 3). 25 patients were presented with Thoraco abdominal trauma in which 4 patients were treated with splenectomy, 4 patients were treated with intestinal repair, 3 patients were treated with liver repair, 5 patients were treated with combined laparotomy and chest intubation, 9 patients were found with no internal injury treated conservatively (Table 4). Better outcomes were seen in 45 patients and mortality was seen in 5 patients (Table 5).

Table 1. Age distributions (n=50)

Age	No. of patients	Percentage
15 to 40 years	25	50.0%
41 to 55 years	13	26.0%
56 to 70 years	12	24.0%

Table 2. Traumatic distribution (n = 50)

Traumatic distribution	No. of patients	Percentage
Trauma in Chest in which 5 Penetrating & 20 Blunt trauma	25	50.0%
Thoraco Abdominal trauma in which 2 Penetrating & 8 Blunt trauma	10	20.0%
Abdominal trauma in which 3 Penetrating & 12 Blunt trauma	15	30.0%

Table 3. Treatment options of chest trauma (Airway Breathing) (n=25)

Procedure	No. of patients	Percentage
Needle thoracosentesis with chest intubation	10	20.0%
Cricothyroidotomy	5	10.0%
Endotracheal intubation	5	10.0%
Thoracotomy	3	6.0%
Cardiocentesis	2	4.0%

Table 4. Treatment options of Thoraco abdominal trauma n=25

Types of Abdominal trauma	Surgical procedure	No. of patients	Percentage
Traumatic liver injury	Liver repair and packing	3	6.0%
Traumatic splenic injury	Splenectomy	4	8.0%
Traumatic gut injury	Intestinal repair	4	8.0%
Bruise over			
Thoraco abdominal injury	Laparotomy & chest intubation	5	10.0%
Bruise over chest & abdomen	Conservatively	9	18.0%

Table 5. Outcome of treatment of patients combine Chest and Abdomen (n=50)

Types of Chest and Abdomen injury	No of patients	Percentage
Outcome	45	90 %
Mortality	5	10%

4. DISCUSSION

Traumatic injury is a serious and critical problem all over the world. Trauma may be blunt/penetrating trauma, trauma can occur over thorax, abdomen, head & neck and musculo skeleton system. Any critical injury not diagnose, treat on spot. Patient can die within minutes, seconds and hours. Traumatic patient can present with loss of consciousness, change of behavior, hypoxia, hypercarbia, acidosis. Dyspnea, chest pain, cyanosis, bleeding, sign and symptoms of shock depend on amount of blood loss, superficial and deep tenderness positive over chest and abdomen, hypotension, tachycardia, tachypnea, oliguria [9]. Traumatic

patient can manage according to the protocol of ATLS, Planning the treatment and assessment. Initial assessment includes preparation, Triage, Primary survey, Resuscitation, Adjuncts to primary survey and resuscitation, Consideration of the need for patient transfer, Secondary survey head-to-toe evaluation and patient history, Adjuncts to the secondary survey, Continued post resuscitation monitoring and reevaluation and Definitive care. Best judgment of dead and alive patient on triage. Followed by primary survey clear the air way with cervical spine protection either upper or lower air way with good response of command/voice, without respiratory distress, breathing pattern clear airway without compromising circulatory system,

shock, hypotension, tachycardia, tachypnea, altered level of consciousness and hypothermia after complete the primary survey patient is vitally stable perform secondary survey thorough examination and investigation. X-ray, MRI of cervical, Thoracic spine, lumbo sacral spine, chest and pelvic bone [10]. Some routine investigations Complete blood picture, blood urea, blood sugar, serum creatinine, serum electrolyte, LFT, HBSAG, HCV, HIV & COVID 19. Treatment according to ATLS i-e, clear the airway with cervical spine protection, endotracheal intubation, cricothyroidotomy, needle thoracocentesis, chest intubation, and three sided sealed dressing, pericardiocentesis. Pass bilateral wide bore I v cannula no 16, CVP line, transfused crystalloids or colloids fluid, blood transfusion pain killer tetanus prophylaxis [11]. If patient is vitally unstable means patient still bleed needs surgical intervention. If patient stable can treat conservatively Began J et al. [12] in his study showed majority of patient with isolated thoraco abdominal trauma arriving alive and without severe head injury managed conservatively without thoracotomy or laparotomy most solid organ managed non operatively. Meera TH, Nabachandra H et al. [13], in his study majority of the cases were in the age group of 21-30 years followed by the age group of 31-40 year, majority of blunt thoracoabdominal injuries were due to vascular accident. Ameh EH et al. [14] in his study showed commonest cause of blunt abdominal trauma was vehicular accident. Mason JK, et al. [15], in his study showed minor abrasions, bruises to ragged lacerations and de gloving injuries seen. Chamatal P, et al. [16], in his study 78 patients were injured in liver trauma. Denetriades D et al. [17], in his study Showed traumatic patient treated without surgery. Van vugt R et al. [18], in his study showed Mortality rate increased in during class 111 or 1V type of shock require surgical intervention. Naskala L et al. [19], in his study showed 27 patients had thoracoabdominal step injury, 5 had gunshot injury, 14 patients had left sided injury and 18 patients had right sided injury. The incidence of diaphragmatic injury was 37.5%. In this Study 50 patients were observed of Thoraco abdominal trauma, the maximum numbers of patients were in age group 15-70 years. 25 patients were belonging to age groups 15 to 40 year. 13 patients were in age groups 41 to 55 years. 12 patients were in were in age groups 56 to 70 year. Out of 50 patient 25 patients were presented with thoracic trauma. In which 5 patients were presented with penetrating injury &

20 patients were presented with blunt trauma. 10 patients were presented combine Thoraco abdominal trauma. In which 2 patients were presented with penetrating injury & 8 patients were presented with Blunt trauma. 15 patients were presented abdominal trauma, in which 3 patients were presented with penetrating injury & 12 patients were presented with Blunt trauma. In related chest trauma, 10 patients were treated needle thoracotomy with chest intubation, 5 patients were treated cricothyroidotomy, 5 patients were treated endotracheal intubation, 3 patients were treated thoracotomy and 2 patients were need pericardiocentesis. 12 patients were presented with Thoraco abdominal trauma in which 4 patients were treated splenectomy, 4 patients were treated intestinal repair. 3 patients were treated by liver repair, 5 patients were treated with combine laparotomy and chest intubation, 9 patients were treated conservatively. Better outcome were seen in 45 patients and mortality were seen in 5 patients.

5. CONCLUSION

Advance trauma and life support (ATLS) has a vital role in thoraco abdominal trauma intervention. 90% of successful interventions were obtained using advance trauma and life support. To get more reliable results more studies on cohort group are required.

CONSENT

Informed consent was taken and preserved by the authors.

ETHICAL APPROVAL

Research Ethics Committee of Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro, Sindh, Pakistan gave the approval to conduct the study.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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