EVALUATION OF MANAGEMENT OF ABDOMINAL TRAUMA

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ABSTRACT

BACKGROUND

Abdominal trauma has now become one of the leading causes of death. TAEI (Trauma and Emergency Intervention) has gained much attention recently. Abdominal trauma both blunt and penetrating injuries are common in RTA, agricultural injuries, assault and fall injuries. Early diagnosis and intervention reduce morbidity and mortality.

Aims and Objectives- This study was designed to analyse mode of injury of abdominal trauma, incidence among rural population and various investigations to confirm diagnosis.

MATERIALS AND METHODS

The descriptive study of 100 patients admitted in emergency ward with abdominal trauma of varied aetiology were grouped into blunt trauma and penetrating trauma. Their mode of injury, cause and condition on admission, investigations and management data were collected for this observational study.

RESULTS

Blunt injury abdomen due to road traffic accidents was the most common abdominal trauma followed by agriculture related injuries. Assault was the major cause for penetrating injuries followed by bull horn injuries. Mortality in these groups was found to be higher than blunt trauma, because of associated peritonitis and sepsis.

CONCLUSION

Blunt abdominal trauma is the common abdominal trauma. Road traffic accidents are found to be the major cause and associated head injuries, multiorgan injuries as indicated by revised trauma score influence the morbidity and mortality. Hollow viscous perforation followed by injury to mesentery is common in penetrating injuries in which mortality is high compared to blunt trauma, since bowel injury with associated peritonitis is common in this group.

KEY WORDS

Complications, Drains, Postoperative Pains, Seroma.

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BACKGROUND

Trauma is an accidental or intentional injury caused by energy, which is usually mechanical in nature to a victim; 1% of hospital admissions for trauma involve the abdomen. Several abdominal injuries are common in patients with multiple injuries.[1]

Trauma to the abdomen are classified as blunt and penetrating injuries. Non-penetrating is common in trauma in rural victims, mainly due to road traffic accidents.[2] Damage to organs can occur in both penetrating and non-penetrating trauma. The sudden application of pressure in non-penetrating trauma is more likely to rupture solid organ, while penetrating trauma causes more injury to hollow viscus.

The major life-threatening situation occurring following organ injury in non-penetrating trauma is haemorrhage. In hollow viscous perforation, it is associated with chemical and bacterial peritonitis.[3]

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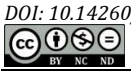


Penetrating injuries can be diagnosed more easily than blunt trauma, because of masked clinical signs in some cases. Age, sex, trauma score, associated cranial injury affect the mortality and morbidity.[4]

Principles of treatment for various organ injuries are also directed towards control of haemorrhage and peritoneal contaminations. Knowledge of the mechanism of injury together with the presence of associated injuries such as fracture ribs, fracture long bones and fracture pelvis will provide high index of suspicion of various organ involvement in abdominal injury.[5]

Aims and Objectives

Evaluation of emergency management of organ injuries and sequelae in penetrating and non-penetrating abdominal trauma in patients admitted in trauma ward of Government Chengalpattu Medical College Hospital.

Single and Multiple Organ Injuries- Incidence, Effects and Sequelae

- To know the various epidemiological factors related to trauma.
- To know the cause and mode of injury in organ injuries.

Inclusion Criteria

1. Adult patients in emergency ward admitted with abdominal trauma in both sexes.

2. MLC and Non-MLC cases irrespective of operative and non-operative management.

Exclusion Criteria

1. Patients already operated outside for abdominal trauma management.
2. Very critically injured persons, who died within few hours of admission.

MATERIALS AND METHODS

Adult patients of both sexes admitted in trauma ward, Govt. Chengalpattu Medical College, Chengalpattu, which is a suburb, caters surrounding rural population of low socio-economic group studied. Agriculture is the main source of income. Hence, in this study agriculture related abdominal trauma is included. It is a descriptive study. Physical findings on admission, revised trauma score, investigation and treatment, per-operative and post-operative follow-up all documented for analysis. This study was a descriptive study done in Chengalpattu Medical College during the period from June 2016 to May 2017 for a period of one year.

100 consecutive cases of abdominal trauma were chosen from this department. These 100 cases were classified into penetrating and non-penetrating types according to the standard classification based on history and physical findings.

Data

Data collected include mechanism of injury, initial assessment of airway, breathing and circulation, associated injuries including head and neck, chest and bony injuries. Severity of injury assessed by injury severity score, Glasgow coma scale, blood pressure and oxygen saturation. Mode of injury, surgical intervention, observation, outcome, SICU care were all documented and analysed using SPSS version 18 with p-value < 0 was considered to be a significant difference.

RESULTS

Out of 100 Consecutive Cases of Abdominal Injuries-

- 78 cases were of non-penetrating type.
- 22 cases were of penetrating type.

Thus, the ratio of non-penetrating type to penetrating types were 39: 11. The major cause in non-penetrating injuries were due to Road Traffic Accidents.

Patients' Demographic and Basic Data (n= 100)

Variable	
Male	88
Mean Age (Years)	33
Blunt Trauma	
Road traffic accidents	58
Agriculture related injuries (Tractor, Farm Equipment, Machinery injuries)	12
Fall injuries	8
Penetrating Injuries	22
Assault 20	20
Bull horn injury 02	02

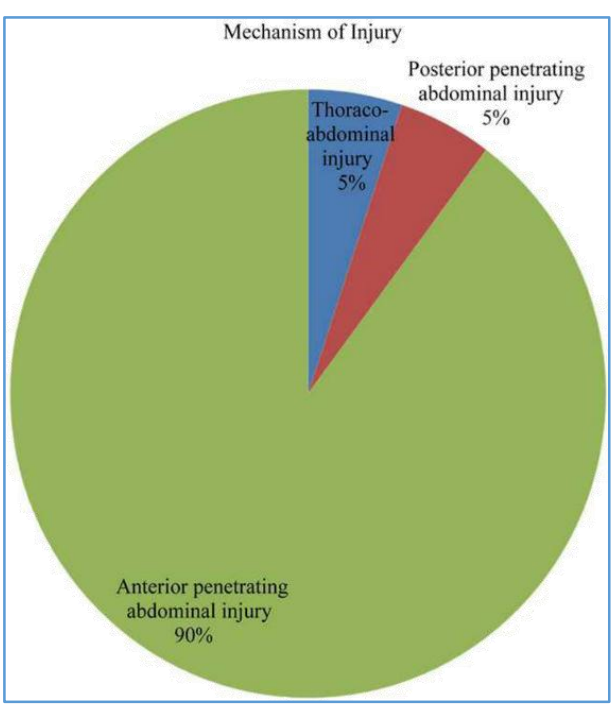
88% of the study population were males, 85.2% of blunt trauma were due to RTA. Mohamad et al of Suez Canal[6] University also reported similar incidence. Chris Nickson in his article on abdominal trauma reported that most penetrating trauma in western countries due to Gunshot injuries and assault injury.

In our study, 90% penetrating injuries was due to assault and 8% due to bull horn injuries. Head injury was the common associated. Injury in blunt trauma 46% and 21% had polytrauma like rib fracture and pelvic injury, 13% had injuries to the extremities including vascular injuries. 90% of the blunt trauma involved single solid organ in case of penetrating injuries, 98% involved hollow viscous, 18.5% of the cases had comorbid conditions with diabetes and hypertension. Males were more affected than female, consistent with Lone et al reported ratio of 4: 4.

Variables	**n=100**
Associated Injuries	**Percentage**
Head injuries	46%
Chest injuries	21%
Extremity injuries, comorbidities	13%
Single organ injury	20%

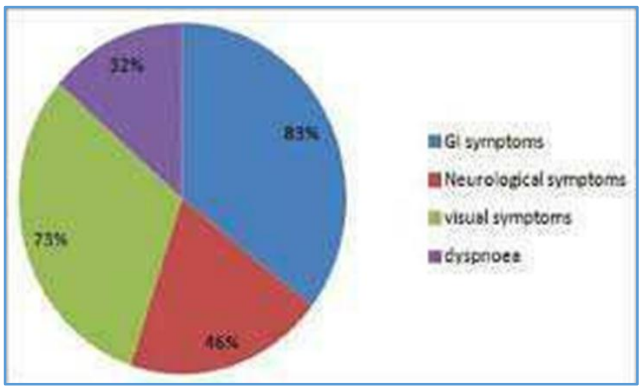
In trauma abdomen, systematic approach is used in diagnosis and management.[7] USG is useful in initial assessment. CT abdomen has more sensitivity 97% than for penetrating injury reported in many studies. FAST is useful if the abdominal cavity contains minimum of 250 mL. In case of pelvic fractures, FAST and DPL are not very reliable. FAST may miss extra-abdominal injuries.[8] Many studies concur that USG is the diagnosis of choice in haemodynamically unstable patient, but CT is the choice of investigation in stable patients. Mortality in this study was 6%, mainly due to associated head and rib injuries. 80% of the patient needed laparotomy, 2% of which was found to be negative. 12% had only minor trauma like muscle injury, haematoma of the mesentery, retroperitoneal haematoma managed conservatively. Mortality and morbidity is determined by associated injuries, mainly head injuries, chest injuries, comorbid conditions and delay in admission.[9]

Incidence of Various Organ Injury in Penetrating Trauma

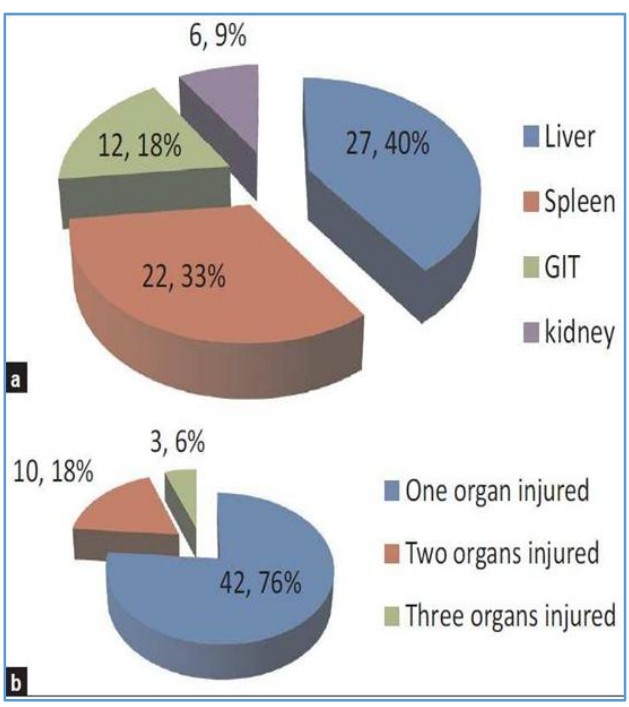


Multiple organ injuries were common than single organ injury in penetrating trauma.

Symptoms of Signs



Organs Involved	No	Pallor	Tachycardia	Hypotension	Tenderness and Guarding
Spleen	49	9	9	9	9
Liver	9	1	1	1	2
Small Bowel	3 Jejunum and 5 Ileum	2	7	1	8
Mesentery	2	0	1	0	2
Blunt Injury					



Penetrating Injuries		
The incidence of single organ injury in penetrating trauma was -		16
The incidence of multiorgan injury was	-	4
The incidence of negative laparotomy was	-	2
Thus, percentage of single organ injury was	-	77.7%
The percentage of multiorgan injury was	-	18.1%
Percentage of negative findings was	-	9%

DISCUSSION

Abdominal trauma, both blunt and penetrating involves young male patients, average age being 38 affected, which not only affect the family but also adds to the economic burden of the country. Tuma et al recorded injuries due to fall in height quite common in young males with similar incidence. Fall injuries are quite common in adults involved in construction sites. Rapid shifting of patient to hospital from accident site helps in better prognosis. In cases of blunt trauma, liver is the commonly injured organ > spleen > hollow viscous. Some authors differed that spleen is the commonly injured organ. Costa et al reported bowel injuries of 10% consistent with our findings; however, Hildebrand reported 21% bowel injuries with relatively higher incidence. 32% of blunt trauma and 100% of penetrating trauma underwent laparotomy. In case of penetrating trauma 66% found only minor trauma, 68% of blunt trauma were on observation only.

Studies	Bowel Injury	Large Bowel
Costa et al	10	6
Hildebrand	21	-
Watts et al	3	0.9
Our study		

Mortality was quite high in penetrating injuries, mainly due to peritonitis, since the involvement of hollow viscous is quite high compared to blunt trauma.[10] Incidence of septicaemia due to peritonitis in our study was 9% and Osborn et al reported sepsis only 2%. This may be due to delay in admission in some cases, referred from other hospitals in our study. In blunt trauma, mortality is mainly due to associated head injury (68%) and haemorrhage.[11] Indication for laparotomy determined by trauma series x-rays, USG, CT and FAST and DPL is rarely used now-a-days to confirm haemoperitonium.[12]

CONCLUSION

Trauma abdomen is very common in road traffic accidents. Physical examination and imaging help in diagnosis of solid and visceral injuries. Sepsis and peritonitis are the reason for morbidity and mortality in penetrating injuries. Associated head injuries increase the mortality in blunt trauma. Timely arrival to emergency room, proper investigation and appropriate intervention help to reduce mortality.

The following Conclusions were drawn from this Study-

- Non-penetrating trauma is more common than penetrating trauma.
- Solid organ injury is common in non-penetrating trauma.
- Hollow viscous injury is common in penetrating trauma.
- Spleen is the commonest organ affected in non-penetrating trauma.
- Liver injuries in this study are not very serious and they are treatable. Extensive liver injuries are potentially dangerous.
- Hollow viscous like jejunum, ileum, colon and stomach are the common organs affected in penetrating trauma.
- Mortality and morbidity depend on delay in treatment, number of organs affected, number of injuries in each organ and which organ is affected.
- Omentum is the commonest structure to be prolapsed in wound site in penetrating trauma.

- Bladder is the common organ associated with pelvic bone fractures.
- Wound infection is the common complication in the penetrating trauma.
- Young males in the productive age group of 20 - 30 years are predominantly affected.

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