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Abdominal Trauma in adults - its outcome - a prospective study in a teritiary health care centre in Andhra Pradesh

KEYWORDS: abdominal trauma, aetiology, Site of injury,Mode of injury, treatment, outcome,

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ABSTRACT *Abdominal trauma continues to be a major cause of trauma admissions all over the world and contributes significantly to high morbidity and mortality. A descriptive prospective study was conducted at SVRRGG hospital,Tirupathi to describe our experience on the management of abdominal trauma outlining the causes, injury characteristics and treatment outcome of these patients. A total of 100 patients were studied. Male to female ratio was 4: 1. The most common age group affected was 31-45years. 62% of patients sustained blunt abdominal injuries. Road traffic accidents (RTAs) were the most common cause of injury. The spleen was the most common injured organ in blunt abdominal trauma occurring in 20% of patients while in penetrating injury; Jejenum was the most common in 40% of patients.*

Introduction

Trauma continues to be a major public health problem worldwide and it is associated with high morbidity and mortality in every country, regardless of the level of socioeconomic development [15] Trauma is reported to be the leading cause of death, hospitalization, and long-term disabilities in the first four decades of life (16). Globally, approximately one third of trauma patients have abdominal trauma and it accounts for a large fraction of tragic loss of life and unrecognized abdominal injury remains a distressing frequent cause of preventable death (Hemmila &Wahl, 2008). Abdomen is the third most common injured region with injuries requiring surgery in about 25% of civilian trauma victims[17].The abdomen is vulnerable to injury since there is minimal bony protection for underlying organs [18]. In developing countries , trauma in general and abdominal trauma in particular is increasing at a fast rate due to increase in urbanization, motorization, civil violence, wars and criminal activities [18].

The etiological spectrum and mechanism of injury of abdominal trauma which have been reported in literature vary from one part of the world to another partly because of variations in infrastructure, civil violence, wars and crime[19]. Abdominal trauma is traditionally classified as either blunt or penetrating [15]. Blunt abdominal trauma predominates in rural areas, while penetrating ones are more frequent in urban settings (Hemmila &Wahl, 2008). Road traffic accidents are the commonest cause of blunt abdominal trauma in civilian practice [20,21,22]

Abdominal trauma poses a diagnostic challenge to trauma and general surgeons practicing in resource-limited countries where advanced diagnostic tools such as Focused Assessment Sonography for Trauma (FAST) and CT scan are not available[3,4,5,18] Whereas penetrating abdominal trauma can usually be diagnosed easily and reliably, the diagnosis of blunt abdominal trauma is a real challenge even for experienced trauma surgeons. The clinical findings are usually not reliable. Many injuries such as fractures of lower chest ribs, contusion and abrasions of the abdominal wall, presence of fractured lumbar vertebrae with retroperitoneal hematoma, and reduced level of consciousness may not manifest during the initial assessment and treatment period. Mechanisms of injury often result in other associated injuries that may divert the physician's attention from potentially life-threatening intra-abdominal pathology (Abbas & Upadhyay, 2004). The management of patients with abdominal trauma has several important elements: adequate pre-hospital care, rapid transport to a specialized centre, complex in-hospital care and rehabilitation. The pre-hospital phase of management is the most important interval in determining the ultimate outcome of these patients. Lack of advanced pre-hospital care in our environment coupled with ineffective ambulance system for transportation of patients to hospitals are major challenges in providing care for trauma patients and have contributed significantly to poor outcome of these patients due to delay in definitive management.

In recent years many abdominal injuries especially those involving solid organs are managed non-operatively. This has been made possible by the invention of imaging techniques like ultrasonography, computerized tomography (CT) scan and magnetic resonance imaging (MRI) which shows the site and extent of injury. The injured organ can then be observed over time as it heals [23,24,25].

However, in resource-limited countries like ours, these modern diagnostic facilities are lacking making non-operative treatment a major challenge. Most of abdominal injuries are preventable. Establishment of preventive strategies as well as treatment guidelines requires a clearer understanding of the causes, injury characteristics and treatment outcome of these patients. However, such data are lacking in our environment. It is on this background that this study, seeks to describe our own experience on the management of this condition outlining the causes, injury characteristics and treatment outcome as seen in our institution and to have a baseline data for future comparison.

Materials and Methods

A prospective study of 100 patients, presenting with abdominal trauma over a period of 1 year from July 2014 to June 2015 at S.V.R.R. Govt General hospital, Tirupati was undertaken. All cases of abdominal trauma treated by surgery in one year were included in the study. Patients with other injuries were excluded from this study .An analysis

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of all emergency procedures with special attention to their morbidity rates on an average was undertaken .For the purpose of study particulars of the patient with regard to age ,sex , clinical features , operative details and postoperative outcome were noted down. From these data critical evaluation was made regarding points in diagnosis,choice of operative procedure and prognostic indices. Clinical examination ,X- ray findings and lab investigations were emphasized with regard to diagnosis and prognosis.

Results :

Table 1 Age in years

Age (in years)	Number
15-30	32
31-45	46
46-60	14
61-75	05
76-90	03
	100

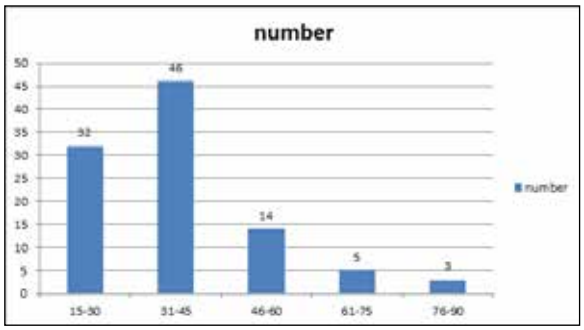

Figure 1 : Age in years

Table 1 : 100 patients with abdominal trauma were admitted in 2014. The commonest age group affected was 31-45 yrs. 46% patients were included in this group

Table 2 Sex distribution

Sex	Number
Male	80
Female	20
	100

Table 2: Of 100 patients ,80% were male and 20% were female.

Table 3 Mode of injury

Mode of Injury	Number
Penetrating Injury	38
Blunt Injury	62
	100

Table 3: 38% had penetrating injury and 62% had blunt injury.

Table 4 Site of injury in penetrating injury

Site of Injury	Number	%
Jejenum	15	40
Rectum and Anal canal	6	16
Spleen	5	12
Splenic Flexure	3	8
Parietal wall	3	8
Transverse Colon	3	8
Perineal Tear	3	8
	38	100

Table 4: Among penetrating injuries, 40% had injury to jejenum and 16% had injury to rectum and anal canal.

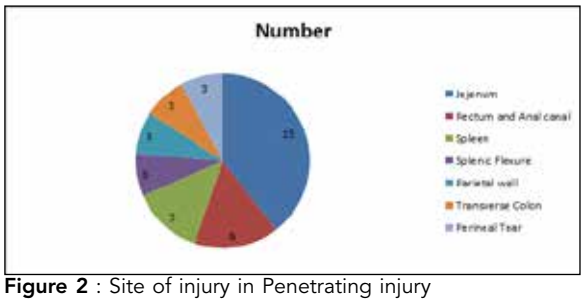

Figure 2 : Site of injury in Penetrating injury

Table 5 Site of injury in Blunt injury

Site of Injury	Number	%
Jejenum	3	5
Mesentery Tear	10	16
Ileum	11	17
Ascending Colon	5	8
Spleen	13	20
Splenic Flexure	3	5
Parietal Wall	3	5
Stomach	4	6
Lesser Sac	2	3
Cecum	2	3
Liver	6	11
	62	100

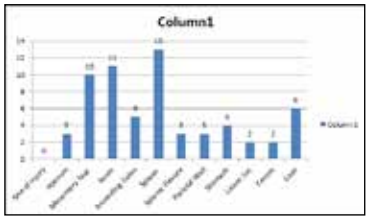

Figure 3 : Site of injury in blunt injury

Table 5 : Among the blunt injury patients , Spleen is the most common organ injured and Ileum is the second most organ affected .

Table 6: Procedures done

Procedure done	Number
Perforation closure	35
Tear ligation	13
Lesser sac rent repair	02
Parietal wall defect	06
Spleenectomy	18
Perineal tear	03
Hemicolectomy	03
Resection and Anastomosis	20
	100

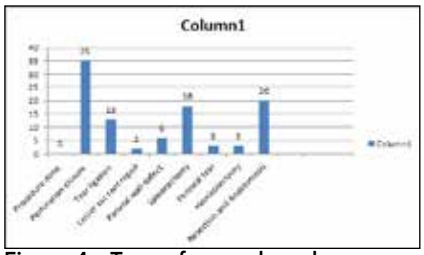

Figure 4 : Type of procedure done

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Table : 7 Post operative complications

Post operative complications	Number
Surgical site infection	35
Hypovolemic shock	20
Enterocutaneous fistula	10
Intraabdominal abscess	05
Paralytic ileus	10
Wound dehiscence	05
Urinary tract infection	10
	100

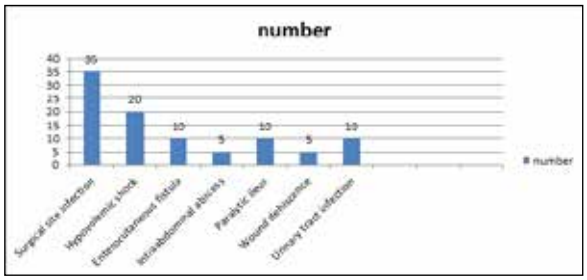

Figure 5 Post operative complications

Discussion

Abdominal trauma continues to be a major cause of trauma admission all over the world and contributes significantly to high morbidity and mortality [1]. In agreement with other studies[2,3,4,5] the majority of abdominal trauma patients in the present study were foundto be young in their third decade of life and tended to affect more males than females. This group

represents the economically active age and the reason for the high incidence of abdominal trauma in this age group reflects their high activity levels and participation in high-risk activities. The fact that the economically productive age-group was mostly involved demands an urgent public policy response. Male predominance in the current study is due to their increased participation in high-risk activities. Males are the bread earners in most households, and are probably more involved in activities that predispose them to injury in the process of trying to earn a living. Identification of risk taking behaviour among trauma patients has potential significance for the prevention of injuries. Trauma in general and abdominal trauma in particular has been reported to be more prevalent in people with low socio-economic status [6], As reported by other authors [3,7,8], more than three-quarter of patients in our study sustained blunt abdominal injuries. This observation is at variant with other studies[2,9,11] which reported penetrating abdominal trauma as the most common mechanism of abdominal trauma. The high incidence of blunt abdominal trauma in this study can be explained by the fact that those patients who had blunt injuries were mostly involved in road traffic accidents; another common feature of increased motorization in this environment. Blunt abdominal trauma is more likely to be missed because clinical signs are less obvious[10].

Road traffic accidents remain a leading cause of trauma and admissions to the A&E departments of most hospitals in Tanzania and contributing significantly to high morbidity and mortality [3,4,5]. In this study, road traffic accidents were the most common cause of abdominal trauma and the majority of patients were due to motorcycle accident[3,4,5] Findings from this study calls for urgent interventions targeting at reducing the occurrence of road traffic accidents and subsequently reduce the incidence of these injuries in this region.

Abdominal injuries are commonly associated with other injuries and these may complicate the management and affect the outcome.[11] In this study the head/neck and musculoskeletal were the most frequently injured regions which is in agreement with findings from other studies done elsewhere[3,4,5]. In the present study, the presence of associated injuries was found to be significantly associated with both mortality and length of hospital stay (morbidity). Early recognition and treatment of associated injuries is important in order to reduce mortality and morbidity associated with abdominal injuries.

As reported by other studies[11,12] the spleen was the most commonly injured organ among the patients who had exploratory laparotomy. Despite being protected under the bony ribcage, the spleen remains amongst the most vulnerable organs sustaining injury from amongst the abdominal trauma cases in all age groups. In this study, the spleen was found to be the most commonly injured intra-abdominal organ in blunt abdominal injuries, whereas gastrointestinal tract was injured most in penetrating abdominal injuries. The findings in this study conform to previous studies elsewhere that confirmed that the gastrointestinal tract is injured most in penetrating than blunt injuries [13]. Injury to the gut in blunt abdominal injury is uncommon but not a rarity [13]. Splenectomy was the commonest means of treatment of splenic injuries. This agrees with the previous study by Chalya *et al.* (2012) in which the majority of patients with splenic injuries were treated operatively with most of them subjected to splenectomy. This is in contrast with other centres in the world where the success of conservative strategies on the injured spleen has been complemented with CT scan and angiographic embolization for splenic injury to control haemorrhage [14] Currently non operative treatment is attempted in 60 – 90% of patients with splenic injuries [14] The tendency of treating splenic injuries by splenectomy can be attributed to limited access to CT scan expertise as well as lack of treatment guidelines in imaging such injuries.

The primary management of blunt liver trauma includes perihepatic packing, omental packing ,finger fracture method with direct suture ligation, resectional debridement ,anatomical resection, angiographic embolisation. [26]. In this study, we practiced finger fracture method with direct suture ligation and application of gelfoam.

Conclusion

Abdominal Trauma remains a major cause of mortality in our environment, road traffic accidents being the most common cause. It is apparent from this report that increased efforts to repair early are likely to reduce the incidence and mortality. In addition research aimed at finding ways to identify injury to abdominal organs at an early phase reduces mortality. For affected patients, high quality surgical expertise coupled with sound clinical judgement and early surgery when needed will greatly improve survival.

Furthermore a general improvement in health care infrastructure especially in the rural communities could further reduce mortality as patients may then present early.

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