Original Research Article

A study of patients with abdominal trauma in a tertiary care centre with special emphasis on factors influencing outcomes

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Abstract

The aim of this study was to study the abdominal injury patients attending a tertiary care centre and its outcome influencers since this can help in early identification of negative determinants and reduce the mortality. This kind of study was not conducted in this institute earlier. **Methodology:** A prospective study of 100 patients, conveniently selected, presenting with abdominal trauma over a period of one and half year from Jan 2018 to June 2019 at SKMCH, Muzaffarpur, Bihar was undertaken. Ethical clearance was obtained from Institutional Ethical Review Board. 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 of all emergency procedures with special attention to their morbidity rates on an average was undertaken. **Results:** This study included 100 patients, 78 (78%) males and 22 (22%) females. The mean age was 32.4 years (range 5–71 years). The most common age group was 31-45 yrs of age and included 37 patients (37%). Mode of injury was penetrating in 32 patients and blunt in 68 patients. **Conclusion:** In this study, blunt abdominal injury was the most common type of injury. Splenic injury was the most common solid organ involved followed by bowel, while RTAs were the most common cause of injury. Younger people and males were commonly affected, and the most common complications were surgical site infection.

Keywords: Abdominal Trauma, Outcomes, patient.

Introduction

Trauma is the study of medical problems associated with physical injury. The injury is the adverse effect of a physical force upon a person. Trauma is the leading cause of death and disability in developing countries and the most common cause of death under 45 years of age. Countries across the world are going through major urbanization, motorization, industrialization and alteration in the socioeconomic values. India is no different to this changing trend. Due to these changes, road traffic accidents have become the most important public hazard in the world, resulting in one of the largest threats against human lives and safety[1].india is the leading country in the number of deaths due to Road traffic accidents[2].Abdomen is the third most common injured region with injuries requiring surgery in about 25% of civilian trauma victims[3].The abdomen is vulnerable to injury since there is minimal bony protection for underlying organs[4].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[4]. Abdominal trauma is traditionally classified as either blunt or penetrating[5]. Blunt abdominal trauma predominates in rural areas, while penetrating ones are more frequent in urban settings.[6] Road traffic accidents are the commonest cause of blunt abdominal trauma in civilian practice[7]. Penetrating abdominal trauma can usually be diagnosed easily and reliably, whereas blunt abdominal trauma is often missed because clinical signs are less obvious. Blunt abdominal injuries predominate in rural areas, whereas penetrating ones are more frequent in urban settings. Penetrating abdominal trauma is often subdivided into stab wounds and gunshot wounds, which require different methods oftreatment.[8] To decrease mortality in cases of abdominal trauma, risk factors for mortality need to be systematically identified and studied. In recent years, studies have identified a number of risk factors, including presence of warning signs, the length of the interval between abdominal injury and surgery, shock at the time of admission, presence of chronic disease, and haemoglobin level in addition to age[9].The aim of this study was to study the abdominal injury patients attending a tertiary care centre and its outcome influencers since this can help in early identification of negative determinants and reduce the mortality. This kind of study was not conducted in this institute earlier.

Objectives

1. To study the pattern of abdominal injury patients attending a tertiary hospital
2. To determine the factors affecting the outcome of these abdominal injury patients

Methodology: A prospective study of 100 patients, conveniently selected, presenting with abdominal trauma over a period of one and half year from Jan 2018 to June 2019 at SKMCH, Muzaffarpur, Bihar was undertaken. Ethical clearance was obtained from Institutional Ethical Review Board. 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 of all emergency procedures with special attention to their morbidity rates on an average was undertaken. Particulars of the patient with regard to age, sex, clinical features, operative details and postoperative outcome were noted down. Severity was assessed using National Injury Severity Score (NISS) into mild, moderate and severe. From these data critical evaluation was made regarding diagnosis, choice of operative procedure and prognostic indices. Clinical examination, X-ray findings, CT findings and lab investigations were emphasized

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with regard to diagnosis and prognosis. Analysis was done using SPSS v20 and analysed for frequencies, mean, SD, chi square test and multiple logistic regression. Significance was considered at p value <0.05.

Results

This study included 100 patients, 78 (78%) males and 22 (22%) females. The mean age was 32.4 years (range 5–71 years). The most common age group was 31-45 yrs of age and included 37 patients (37%) (Table 1). Mode of injury was penetrating in 32 patients and blunt in 68 patients.

Table 1: Age distribution of participants

Age (Yrs)	Number (%)
<15 yrs	5 (5)
15-30	25 (25)
31-45	37 (37)
46-60	18 (18)
61-75	15 (15)
Total	100 (100)

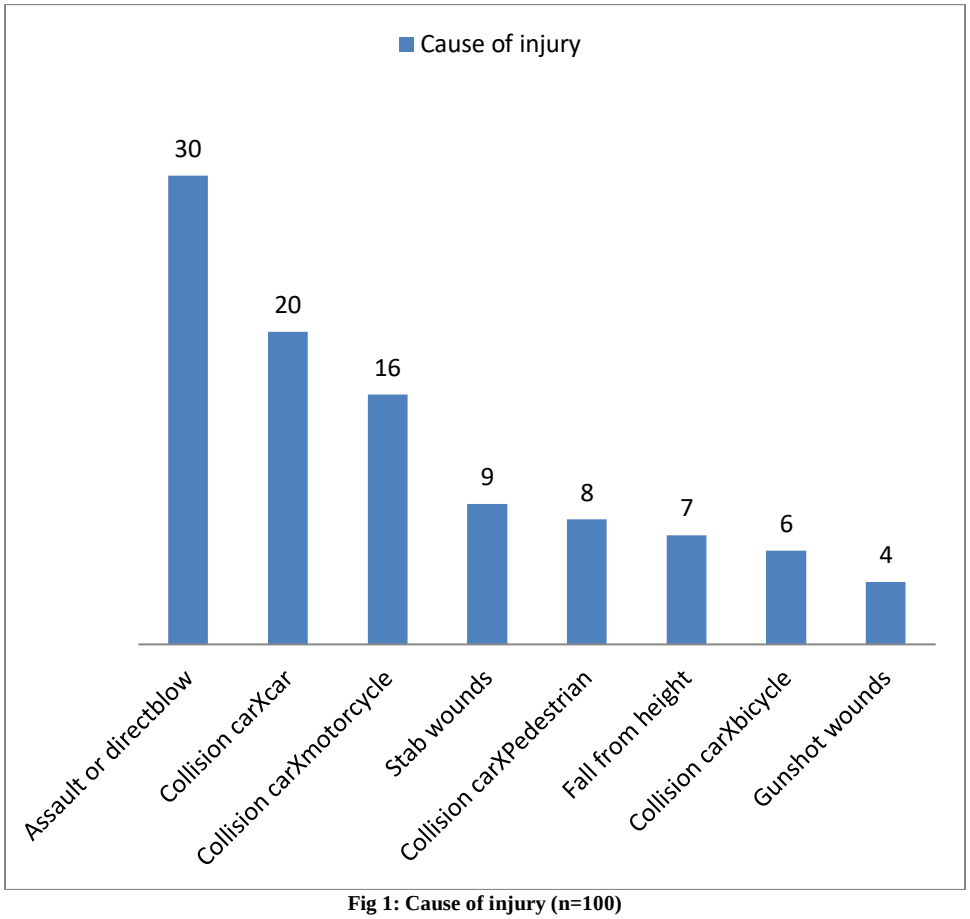

Fig 1: Cause of injury (n=100)

The spleen was the most affected solid organ, and the most affected hallow viscous was the small intestine, ileum in blunt injury and jejunum in penetrating injury (Table 2 & 3). Procedures done are explained in Table 4. Post-operative complications occurred in 66% of patients and surgical site infection was the most common one (Table 5).

Hospital stay ranged from 0 to 7 days in 58 (58%) cases and 8–15 days in 42 (42%) cases. Mean duration of stay was 6.54± 2.41 days. There were 10 deaths, of which 7 were blunt and 3 were penetrating abdominal injury patients. Table 6 shows the factors influencing the outcomes. Death was significantly higher among patients who were brought to the hospital after 6 hrs, who had severe NISS score while admission and those who were anaemic.

Table 2: Site of injury in Blunt abdominal trauma (n=68)

Site of injury	Number (%)
Spleen	15 (22.0)
Ileum	12 (17.6)
Mesenteric tear	10 (14.7)
Liver	7 (10.3)
Stomach	6 (8.8)
Ascending colon	5 (7.3)
Jejunum	3 (4.4)
Splenic flexure	3 (4.4)
Parietal wall	3 (4.4)
Lesser sac	2 (2.9)
Caecum	2 (2.9)

Table3: Site of injury in penetrating abdominal trauma (n=32)

Site of injury	Number (%)
Jejunum	13 (22.0)
Rectum & Anal canal	6 (17.6)
Spleen	5 (14.7)
Splenic flexure	3 (10.3)
Parietal wall	3 (8.8)
Transverse colon	1 (7.3)
Perineal tear	1 (4.4)

Table 4: Procedure done (n=100)

Procedure done	Number (%)
Perforation closure	35 (35)
Resection & Anastomosis	20 (20)
Spleenectomy	20 (20)
Tear ligation	13 (13)
Parietal wall defect	6 (6)
Perineal tear Hemicolectomy	3 (3)
Hemicolectomy	2 (2)
Lesser sac rent repair	1 (1)

Table 5: Post-operative complications (more than one complication possible) (n=66)

Post op complications	Number (%)
Surgical site infection	35 (53.0)
Hypovolemic shock	24 (36.3)
Urinary tract infection	23 (34.8)
Paralytic ileus	20 (30.3)
Enterocutaneous fistula	10 (15.1)
Intra abdominal abscess	10 (15.1)
Wound dehiscence	5 (7.5)

Table 6: Factors influencing outcome

Variable	Death	Alive	Total	Odds Ratio (95% CI)	P value
Age					
≤ 30 yrs	1	29	30	1	
31-60 rs	6	49	55	2.5 (0.6-11.40)	
>60 yrs	3	12	15	2.3 (0.4-16.1)	>0.05
Sex					
Males	9	69	78	1	
Females	1	21	22	0.9 (0.3-7.8)	>0.05
Type of injury					
Blunt	7	61	68	1	
Penetrating	3	29	32	0.8 (0.2-8.0)	>0.05
Time to admission					
< 6hrs	2	78	80	1	
≥6 hrs	8	12	20	3.4 (1.2-7.3)	**0.03**
NISS score					
Mild	0	15	15	1	
Moderate	1	54	55	2.8 (0.3-9.8)	
Severe	9	21	30	17.3 (3.7-21.3)	**0.004**
Duration of stay in hospital					
≤7 days	8	58	66	1	

>7 days	2	32	34	2.5 (0.2-5.5)	>0.05
Anaemia					
No	1	54	55	1	
Yes	9	36	45	3.6 (1.2-6.7)	**0.03**

Discussion

Abdominal trauma continues to be a major cause of trauma admission all over the world and contributes significantly to high morbidity and mortality[10].In agreement with other studies,[11-14] the majority of abdominal trauma patients in the present study were found to 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.

As reported by other authors,[12,15,16]more than three-quarter of patients in our study sustained blunt abdominal injuries. This observation is at variant with other studies,[11,17,18] 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. In this study, road traffic accidents were the most common cause of abdominal trauma and the majority of patients were due to motorcycle accident[12-14].This calls for urgent interventions targeting at reducing the occurrence of road traffic accidents.Other studies have shown that delayed injury arrival time highly contributes to the morbidity and mortality of trauma patients.In the present study, this observation was true; patients who were brought in more than 6 hrs after the injury had significantly higher mortality. This may cause a delay in the initiation of definitive care and thus lead to complications for patients[19-23]

The presence of associated extra-abdominal injuries causes more patients to have severe injury on the NISS and subsequently influences patients' outcomes.[18] In the present study, head injuries, chest injuries and extremity injuries were the most commonly injured parts, similar to findings in other studies.[13] This is attributed to the majority of the patients being involved in RTAs and falls from heights. Higher NISS scoring was associated with high morbidity and mortality in this study. The spleen was the most commonly injured organ, followed by bowels, in blunt abdominal injury. Repair of the bowels was the most common means of treatment, followed by the Spleenectomy. The gastrointestinal tract is commonly injured in penetrating abdominal injuries. These findings are similar to those of other studies[21,22]

Post-operative complications in our study occurred in 66 patients (66%) and was significantly higher compared other studies.[21,22] This finding has an effect on the final outcomes of these patients.With respect to logistic regression analysis, Patients with a time interval > 6 h from injury to admission had 3.4 times higher odds of mortality, Patients with severe injury on the NISS had higher odds of mortality, with OR 17.3 (3.7-21.3) (P-value 0.004). This was similar to a study done in Tanzania[23].The association of outcome with anaemia was significant and had 3.6 times higher mortality (p=0.03) as found in Chandar et al study[24]

The exclusion of patients not consented to participate, patients on conservative management, died prior to operation, patients who were operated in other health facilities and inclusion of patients only proceeded to surgery were limitations and may cause selective bias in this study.

Conclusion

In this study, blunt abdominal injury was the most common type of injury. Splenic injury was the most common solid organ involved followed by bowel, while RTAs were the most common cause of injury. Younger people and males were commonly affected, and the most common complications were surgical site infection. Mortality was highly associated with delays in coming to the hospital, and severe injuries, higher NISS score and presence of anaemia. Furthermore, larger multicentre studies are needed to evaluate the trauma care capability of health care facilities in our region and the impact of trauma to our population. We recommend early and easy availability of ambulance and bedside imaging for trauma patients to avoid longer waiting times for operations.

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