

PROSPECTIVE STUDY ON TRAUMATIC HOLLOW VISCUS INJURIES

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Abstract

Background: Trauma is a major health issue, causing 60-70% of emergency hospital admissions. Orthopaedic and neurological injuries are common, followed by abdominal traumas. Hollow viscus injuries are the most common and require emergency surgical interventions. Early diagnosis and intervention can significantly affect patient outcomes. This study aimed to analyse the mechanism of injury, organ involvement, and accompanying injuries in traumatic hollow viscus. **Materials and Methods:** This prospective, non-randomised, descriptive study included patients admitted to the surgical triage ward of the Mahatma Gandhi Memorial Government Hospital, Trichy, from January 2012 to November 2013. Detailed history and complete physical examination of all trauma patients, blood investigations (complete blood count, renal function tests), blood grouping and typing, chest x-ray PA view, x-ray abdomen erect, USG abdomen and pelvis, CT scan abdomen and pelvic CT scan, and paracentesis. **Results:** This study analysed patients aged 21-30 with the majority being male (85.42%). The most common cause of injury was blunt abdominal trauma (77.08%). The most common morbidities were a prolonged hospital stay (20.83%) and incisional hernias (10.41%). The mortality rate was lower in patients referred early to the hospital (21.05%) and in the triage ward (8.33%). The overall mortality rate was 27.08%, with 70% of the deaths occurring in polytrauma cases. There was a significant difference in the time of reference and the time of surgery between mortality groups. **Conclusion:** With early diagnosis, timely reference, early surgical intervention, and intensive postoperative care, we can save the lives of trauma patients with relatively rare injuries.

INTRODUCTION

Trauma is a major health problem in all countries, and unfortunately forms 60-70% of all emergency admissions to any hospital. Trauma patients need the most important care because they can be salvaged to the maximum. Mahatma Gandhi Memorial Government Hospital, Trichy, attached to K. A. P. V. Government Medical College, is one of the tertiary centres for trauma in Tamil Nadu, where most patients admitted to the surgical triage ward are due to trauma. Systemic evaluation of these patients revealed orthopaedic and neurological injuries to be the most common, followed by abdominal trauma, which formed the third rank next to these injuries.

In our hospital, hollow viscus injuries are the most common abdominal injuries, followed by injuries to solid organs (the liver, spleen, and kidney). Solid organ injuries can be managed with both conservative and surgical management, whereas hollow viscus injuries require emergency surgical intervention because delayed intervention has a worse prognosis. Hence, early diagnosis and intervention in these patients will significantly affect the outcomes.

Aim

This study aimed to analyse the mechanism of injury, organ involvement, and accompanying injuries in traumatic hollow viscus.

MATERIALS AND METHODS

This prospective, non-randomised, descriptive study included 74 patients admitted to the surgical triage ward of the Mahatma Gandhi Memorial Government Hospital, Trichy, from January 2012 to November 2013. The study was approved by the institutional ethics committee before initiation, and informed consent was obtained from all patients.

Inclusion Criteria

All trauma patients with abdominal injuries greater than 13 years of age and both blunt and penetrating abdominal injuries were included.

Exclusion Criteria

Patients with isolated solid organ injuries and those in the paediatric age group (<12 years) were excluded.

Detailed history and complete physical examination of all trauma patients, blood investigations (complete blood count, renal function tests), blood grouping and typing, chest x-ray PA view, x-ray abdomen erect, USG abdomen and pelvis, CT scan abdomen and pelvic CT scan, and paracentesis.

Statistical Analysis.

RESULTS

Abdominal injuries were diagnosed in 74 patients. Of these 74 patients, isolated solid organ injuries were found in 26 patients, either preoperatively or intraoperatively. Thus, they were excluded from the study, and only 48 patients were included.

Most patients were 21-30 years the youngest patient was 16 years old, and the oldest patient was 65 years of age. Regarding sex distribution, the proportion of males was 85.42, females were 14.58%, and males

were slightly higher than those seen in the study. The most common mode of injury-causing injuries was blunt abdominal trauma (77.08%), followed by penetrating abdominal trauma (22.92%). [Table 1]

Isolated perforation was the most common type of injury encountered (64.58%); hence, simple debridement of the wound edges followed by primary wound closure was performed in 77.08% of cases. The most common associated injuries were orthopaedic injuries (30.30%), followed by neurosurgical injuries (24.24%).

Respiratory infection (16.67%) was the most common complication, followed by wound infection (12.5%); the leak rate was the least common complication (2.08%). The most common morbidity was prolonged hospital stay (>14 days), accounting for 20.83%, followed by incisional hernias (10.41%). [Table 2]

Mortality was lower in patients who were referred early to our hospital, that is, within < 2 days, than in those referred late (21.05%). At < 5 h of admission, the triage ward (8.33%) was significantly higher than that in the > 5 h group (18.75%). [Table 3]

The overall mortality rate was 27.08%. Of these, 70% of deaths occurred in polytrauma cases. Mortality was lower in patients who were referred early to our hospital, that is, within two days as compared to those referred late (21.05% vs. 50%). This was proved statistically significant with a p-value of <0.05, and it was also shown that mortality was lower in patients who were taken up for surgery early, that is, within five hours of admission to the triage ward (8.33% vs. 18.75%) which was also statistically significant with a p-value of <0.001. [Table 4]

Table 1: Demographic data of the study

		Number of patients (%)
Age	11-20	3 (6.25%)
	21-30	13 (27.08%)
	31-40	11 (22.91%)
	41-50	11 (22.91%)
	51-60	5 (10.41%)
	61-70	5 (10.41%)
Sex	Male	41 (85.42%)
	Female	7 (14.58%)
Mode of injury	Blunt injury	37 (77.08%)
	Penetrating injury	11 (22.92%)
Time of reference	< 2 days	38 (79.16%)
	>2 days	10 (20.84%)
Timing of surgery	< 5 hours	32 (66.68%)
	> 5 hours	16 (33.33%)
Site of injury	Ileum	17 (35.41%)
	Ileum with mesentery	9 (18.75%)
	Jejunum	7 (14.58%)
	Stomach	6 (12.50%)
	Jejunum with mesentery	5 (10.41%)
	Ascending colon	2 (4.16%)
	Descending colon	2 (4.16%)

Table 2: Type of injury, associated injuries, surgical procedure, ventilatory support, complications, and morbidity of the study

		Number of patients (%)
Type of injury	Single perforation	31 (64.58%)
	Multiple perforations with mesenteric tear	11 (22.91%)
	Multiple perforations	6 (12.50%)
Associated injuries	Orthopaedic	10 (30.30%)
	Neurosurgery	8 (24.24%)
	Solid organ	6 (18.18%)
	Chest	4 (12.12%)
	Urology	3 (9.09%)
	Plastic	2 (6.06%)
Surgical procedure	Primary closure	37 (77.08%)
	Resection and anastomosis	9 (18.75%)
	Ostomies	2 (4.16%)
Ventilatory support	<2 days	13 (27.08%)
	>2 days	6 (12.50%)
Complications	Respiratory infections	8 (16.67%)
	Wound infections	6 (12.50%)
	Urinary tract infections	2 (4.16%)
	Abscess	2 (4.16%)
	Leak	1 (2.08%)
	Ostomy site complications	1 (2.08%)
Morbidity	Prolonged stay >14 days	10 (20.83%)
	Incisional Hernia	5 (10.41%)
	Resurgeries	3 (6.25%)

Table 3: Ventilatory support, time of reference, and time of surgery in mortality of the study

		Number of patients (%)	Mortality
Ventilatory support	<2 days	13 (4.16%)	2
	>2 days	6 (6.25%)	3
Time of reference	< 2 days	38 (21.05%)	8
	>2 days	10 (50%)	5
Time of surgery	<5 hours	32 (8.33%)	4
	>5 hours	16 (18.75%)	9

Table 4: Mortality relation in time of reference and time of surgery of the study

		Mortality		P value
		Death	Alive	
Time of reference	<2 days	8	30	<0.05
	>2 days	5	5	
Time of surgery	<5 hours	4	28	<0.001
	>5 hours	9	7	

DISCUSSION

Abdominal injuries were diagnosed in 74 patients. Of these 74 patients, isolated solid organ injuries were found in 26 patients, either preoperatively or intraoperatively. Thus, they were excluded from the study, and only 48 patients were included. This shows that traumatic hollow viscus injuries were more common than solid organ injuries (64.86% vs. 35.13%). Hence, hollow viscus injuries are more common than solid organ injuries.

In our study, we inferred that most patients belonged to the 21-30 years age group. In the study by Davis et al., most patients belonged to the 21-30 years age group.¹ Therefore, it can be concluded that the young and productive age groups are the usual victims of traumatic hollow viscus injuries.

In our study, there was a clear male predominance (85.42% vs. 14.58%). The male-to-female ratio was 5.8:1 which is slightly higher than that seen in Western studies. In India, males are the chief breadwinners of the family and are involved in outdoor activities.

In our study, the most common mode of injury-causing injuries was blunt abdominal trauma compared to penetrating abdominal trauma (77.08% vs. 22.92%). The major cause of both blunt and penetrating trauma (>90%) is road traffic accidents (RTA), followed by accidental falls. This is because of the rapid development of technology in all fields, including the automobile industry, where priority has been given to speed rather than safety. In 24.12% of the cases, a definitive preoperative diagnosis was possible, and in another 34.94% of the cases, there was only a high index of suspicion.

In our study, the most common site of hollow viscus perforation was the ileum (35.41%), followed by the combined injury of the ileum and mesentery (18.75%), compared to several studies in which the small intestine was the most common site. The descending colon was the most affected site (4.16%). Isolated perforation was the most common type of injury encountered in our study (64.58%); hence, simple debridement of the wound edges followed by primary wound closure was performed in 77.08% of cases. This is based on the concept of damage control surgery, which considerably reduces the duration of the surgery compared to resection and anastomosis. bowel and has shown an increase in the survival rate and a decreased incidence of leaks in these patients.

In our study, the most common associated injuries were orthopaedic injuries (30.30%) followed by neurosurgical injuries (24.24%), as compared to Western literature, where thoracic injuries are the most common of the associated injuries.

In our study, the overall complication rate was 41.66%. Respiratory infection (16.67%) was the most common complication, followed by wound infections (12.5%). The leak rate was the least common complication in our study (2.08%). Our study is comparable to a study by Kaoutar et al. which showed wound infection in 14% of cases.² Another study by Davis et al. showed wound infection as a complication in 15% of the cases.¹ The most common of which was prolonged hospital stay (>14 days) which accounted for 20.83%, followed by incisional hernias (10.41%). Long-term morbidity could not be studied in detail in this study. However, the effects of morbidity on the lifestyle of patients and their long-term prognosis require further follow-up.

The overall mortality rate was 27.08%. Of these, 70% of deaths occurred in polytrauma cases. Mortality was lower in patients who were referred early to our hospital, that is, within two days as compared to those referred late (21.05% vs. 50%). This was proved statistically significant with a p-value of <0.05, and it was also shown that mortality was lower in patients who were taken up for surgery early, that is, within five hours of admission to the triage ward (8.33% vs. 18.75%) which was also statistically significant with a p-value of <0.001.

CONCLUSION

The most common cause of death is associated with polytrauma, followed by septicemia due to delayed referral to our hospital due to the subtle clinical signs seen in these patients or due to misdiagnosis, severe unstable haemodynamic status at the time of presentation leading to delay in surgery for correcting the haemodynamic status, respiratory infections in ventilator support patients, Systemic Inflammatory Response Syndrome (SIRS) leading to multiorgan dysfunction syndrome (MODS), and eventually death.

To reduce mortality, the recent concept of damage control surgery must be stressed, and the feasibility and effectiveness of our setup must be studied further. Therefore, we conclude that early diagnosis, timely reference, early surgical intervention, and intensive postoperative care can save the lives of trauma patients with relatively rare injuries. Adequate knowledge regarding suspected intra-abdominal injuries and timely referral to a tertiary trauma care centre can bring a marked difference in the prognosis of these patients.

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