

## **BLUNT ABDOMINAL TRAUMA: AN EVALUATION AT CHITTAGONG MEDICAL COLLEGE HOSPITAL**

Md Minhajuddin Sajid<sup>1</sup> Md Akbar Husain Bhuiyan<sup>2</sup> MA Mushfiqur Rahman<sup>1</sup>  
Md Abdullah Al Farooq<sup>2</sup> Khurshid Alam Sarwar<sup>1</sup>

### **Summary**

*Blunt Abdominal Trauma (BAT) is a common paediatric surgical problem in Bangladesh. This retrospective study was carried out from July 2010 to June 2013 to evaluate the management of patients with BAT in the department of Paediatric Surgery of Chittagong Medical Hospital. Hospital records were analyzed regarding mechanism of injury, clinical presentations, investigations, treatment and follow up. This study was aimed at observing present management of BAT and advocate further improvement. The age range was up to 12 years. Total number of patients studied was 48, with male:female ratio of 3:1. 9 children were < 5 years of age and 39 children were > 5 years of age. Common mechanism of injury were road traffic accident (56.25%) and fall from a height(31.25%). 33 patients presented within 24 hours (68.75%) and 15 presented after 24 hours (31.25%). 5 patients (10.65%) presented with shock and 34 patients (70.83%) had signs of peritonitis. 36 patients (75%) were treated conservatively and surgical intervention was required in 12 cases (25%). After one month, 1 patient presented with Pancreatic pseudocyst and 2 patient developed intestinal obstruction.*

### **Key words**

Blunt abdominal trauma; Management; Pancreatic pseudocyst; Intestinal obstruction.

- 
1. Assistant Professor of Pediatric Surgery  
Chittagong Medical College, Chittagong
  2. Associate Professor of Pediatric Surgery  
Chittagong Medical College, Chittagong

**Correspondence :** Dr. Md Minhajuddin Sajid  
Email : minhajsajid@yahoo.com  
Cell : 01911811421

### **Introduction**

Blunt abdominal Trauma (BAT) is a leading cause of morbidity and mortality among all age groups. Identification of serious intra-abdominal pathology is often challenging. Many injuries may not manifest during the initial assessment and treatment period. The initial clinical assessment of patients with BAT is often difficult and notably inaccurate. BAT makes up 75% of all blunt traumas and is the most common example of this injury [1]. Upto 25% of pre-pubertal children with multisystem injury have significant abdominal injury. Motor vehicle crashes, auto pedestrian injury in children, bicycle injuries, all terrain injuries and child abuse also contribute [2-5].

The mortality of BAT in children is directly related to the number of structures injured: it is less than 20% in isolated liver, spleen, kidney, or pancreatic trauma; increases to 20% if the gastrointestinal tract is involved; and increases to 50% if major vessels are injured [3].

Children are more vulnerable to abdominal injury caused by blunt forces than are adults. Compared with adults, children have relatively compact torsos with smaller anterior-posterior diameters, which provide a smaller area over which the force of injury can be dissipated. In addition, they have relatively larger viscera, less overlying fat, and weaker abdominal musculature.

Unlike penetrating trauma, which is usually apparent upon inspection, BAT must be suspected from historical information, particularly the mechanism of injury, and careful physical examination [6-9]. Mechanisms of injury that are associated with intra-abdominal trauma include isolated high energy blows to the abdomen (eg, fall from a bicycle on to the handlebar), motor vehicle collisions, seat belt usage, and falls from a height greater than 20 feet [7,10-12].

This study was carried out with a keen intention to see how BAT patients were evaluated and what treatment was adopted and what the outcome was. This study will enable us to improve our management plan in future.

**Materials & methods**

This study was carried out in the department of Paediatric surgery of Chittagong Medical College and Hospital. This was a retrospective study done on the group of patients aged upto 12 years of either sex admitted in the department during the period of July 2010 to June 2013. The patients with penetrating or perforating injury abdomen were excluded from the study as well as the patients who left the hospital after admission without prior evaluation. The total number of patients studied were 48(n=48) in the recorded data which were analyzed.

The following investigations were carried out- Plain X-ray abdomen, USG of whole abdomen, IVU, Liver scan/Renal scan, and X-rays of Limbs and Skull in relevant cases. For fractures of limbs and head injuries, the patients were referred to the departments of Orthopaedics and Neurosurgery respectively. All the cases were followed up for 3 months.

**Results**

**Age and sex distribution**

There were 39 patients between 6-12 years of age and 9 patients below 6 years of age, the average age of presentation being 6 years. Number of male patients was 36 and female patients were 12 with the male: female ratio of 3:1.

**Socio-economic status**

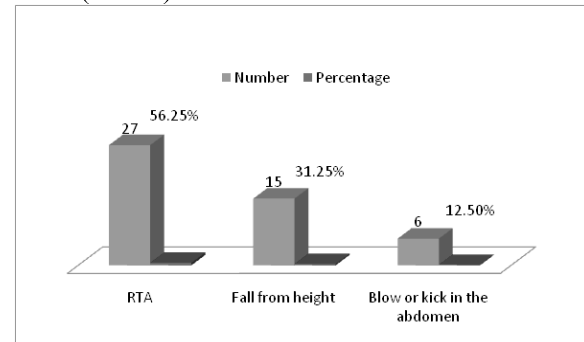
Most of the patients(30) came from low socio-economic status (62.5%) followed by 12 children (25%) from middle class and the rest of the children (6;25%) from well-to-do families.

**Table I : Socio-demographic Status**

Characteristics	Number	Percentage
<b>Age</b>		
6 to 12 Years	39	81.25%
Below 6 Years	9	18.75%
Average Age	6	
<b>Sex</b>		
Male	36	75%
Female	12	25%
<b>Socioeconomic Condition</b>		
Low	30	62%
Middle Class	12	25%
Well to do	6	13%

**Mechanism of injury**

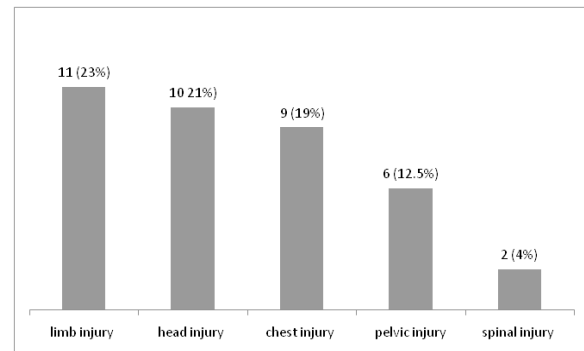
In our study, RTA was the leading cause in 27 patients (56.25%), fall from a height in 15 patients (31.25%), and blow or kick in the abdomen in 6 cases (12.5%).



**Fig 1 : Mechanism of injury**

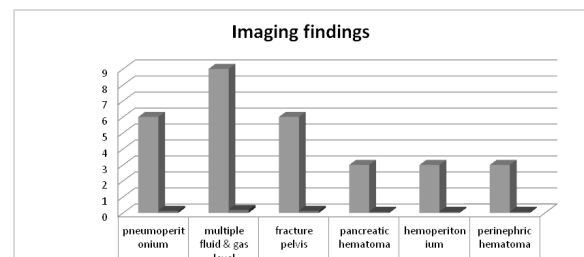
**Signs found in abdomen**

Physical signs of trauma like abdominal distension, bruise, hematoma, abrasions and lacerations were found in only 20 patients(42%). Other findings were signs peritonitis in the form of rigidity and muscle guard and absence of bowel sound.



**Fig 2 : Associated injuries found in BAT patients**

**Imaging findings**



**Fig 3 : Imaging findings in BAT patients**

### Managements

36 patients were treated conservatively (75%). Surgical intervention was required in 12 cases (25%). Among the 36 patients treated conservatively, 15 patients had liver injury, 9 patients had splenic injury, 9 patients had renal injury and 3 patients had pancreatic injury.

The patients with solid organ injury were advised to take absolute bed rest for 1 week followed by light activity at home.

Among them 12 patients that underwent surgical intervention, 9 patients had perforation in the terminal part of the ileum (18.75%) and hematoma in 'the mesentery' and sigmoid mesocolon in 3 cases (6.25%). Most of them recovered uneventfully after proper surgical toileting and repair.

**Table II : Mode of Management**

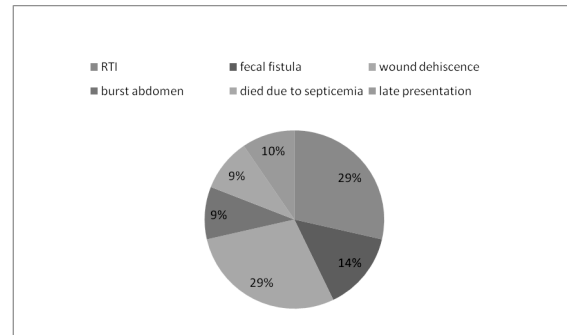
Trauma	Number	Percentage
<b>Conservatively Managed</b>		
Liver Injury	15	31.25%
Splenic Injury	9	18.75%
Renal Injury	9	18.75%
Pancreatic Injury	3	6.25%
<b>Surgically Managed</b>		
Perforation of terminal ileum	9	18.75%
Hematoma in 'the mesentery' and sigmoid mesocolon	3	6.25%

### Complications

6 patients (12.5%) developed respiratory tract infection after surgery owing to immobility and /or nosocomial infections.

3 patients developed faecal fistula (6.25%), 6 patients developed superficial wound dehiscence (12.5%), 2 patients had burst abdomen (4.16%), and 2 patients died (4.16%) after surgical intervention owing to septicaemia. These 2 patients presented late, after 48 hours.

In follow up, 6 patients presented with complications like intestinal obstruction due to bands and adhesion and pancreatic pseudocyst.



**Fig 4 : Complications of operation**

### Discussion

BAT is common incident in paediatric age group. This retrospective study was carried out in the department of Paediatric surgery, Chittagong Medical College and Hospital from July 2010 to June 2013 to evaluate paediatric patients with BAT. In the present study, the average age of presentation is 6 years and male-female ratio is 3:1 but a Nigerian study showed that the average age of presentation was 9 years with a male-female ratio of 3.8:1 which is higher to our study [13].

Majority of BAT cases were due to RTA (56.25%) and fall from a height (31.25%). Blunt trauma accounts for 90% of childhood injuries, with falls and motor vehicle crashes representing the most common mechanisms of injury [14]. Stephen Wegner S. et al showed that Motor vehicle collisions (without proper restraint and ejection from a vehicle), automobile versus pedestrian accidents, and falls are associated with the greatest increased risk of Intra-Abdominal Injuries (IAI) which is similar to our study [15-17].

Pain and distention (mild to moderate) of the abdomen was the commonest mode (34) of presentation in case of abdominal trauma (70.83%). Few patients (6) presented with head injury (12.5%) and some (5) patients with shock (10.66%) in addition to that. A study from Nigeria found abdominal pain, tenderness and hypovolaemic shock as common presentation [13]. Physical signs of trauma like abdominal distension, bruise, haematoma, abrasions and lacerations were found in only 20 patients (42%). Other findings were signs peritonitis in the form of rigidity and muscle guard and absence of bowel sound.

It indicates suspected significant intra- abdominal organ injury. Had found common abdominal signs like lap belt mark, ecchymosis, abdominal distension and peritonitis [18]

In our study, 26 patients(54%) presented with head injury(10 patients=21%), injury to the chest(9 patients =19%), pelvis(6 patients=12.5%), limbs(11 patients=23%) and spine(2 patients=4%) but, All observed associated injuries in extremities,chest, and head in 28(48%) out of 58 BAT patients [19].

Plain X-Ray abdomen were done 15 cases, X Ray Pelvis was done 6 cases, USG of whole were carried out 9 cases. It has been recommended that USG should be the imaging of choice in haemodynamically unstable patient and CT scan for stable patient as diagnosis of blunt abdominal trauma by clinical examination alone is unreliable [14].

36 haemodynamically stable patients (75%) with solid organ injury were treated conservatively and surgical intervention was required in 12 haemodynamically stable patients (25%) but Ramesh found 81% patients being treated conservatively with 19% patient underwent surgery [20].

Two patients had died during resuscitation because of late presentation. After one month follow up, 6 patients presented with complications like intestinal obstruction due to bands and adhesion and pancreatic pseudocyst.

#### Conclusion

The initial clinical assessment of patients with BAT is often difficult and sometimes inaccurate. High index of suspicion with professional acumen, use of modern imaging modalities and early intervention can save lives.

#### Disclosure

All the authors declared no competing interest.

#### References

1. Isenhour JL, Marx J (August 2007). "Advances in abdominal trauma". *Emerg Med Clin North Am* 25 (3): 713–33, ix. doi:10.1016/j.emc.2007.06.002. PMID 17826214.
2. Schafermeyer R. Pediatric trauma. *Emerg Med Clin North Am.* 1993; 11:187.

3. Cooper A, Barlow B, DiScala C, String D. Mortality and truncal injury: the pediatric perspective. *J Pediatr Surg.* 1994; 29:33.

4. Wright MS. Update on pediatric trauma care. *Curr Opin Pediatr.* 1995; 7:292.

5. Rothrock SG, Green SM, Morgan R. Abdominal trauma in infants and children: prompt identification and early management of serious and life-threatening injuries. Part I: injury patterns and initial assessment. *Pediatr Emerg Care.* 2000; 16:106.

6. Saladino RA, Lund DP. Abdominal trauma. In: *Textbook of Pediatric Emergency Medicine*, 6th, Fleisher GR, Ludwig S (Eds), Lippincott Williams and Wilkins, Philadelphia. 2010. 1271.

7. Taylor GA, Eichelberger MR, O'Donnell R, Bowman L. Indications for computed tomography in children with blunt abdominal trauma. *Ann Surg.* 1991; 213:212.

8. Holmes JF, Sokolove PE, Land C, Kuppermann N. Identification of intra-abdominal injuries in children hospitalized following blunt torso trauma. *Acad Emerg Med.* 1999; 6:799.

9. Moss RL, Musemeche CA. Clinical judgment is superior to diagnostic tests in the management of pediatric small bowel injury. *J Pediatr Surg.* 1996; 31:1178.

10. McLellan BA, Rizoli SB, Brennehan FD, et al. Injury pattern and severity in lateral motor vehicle collisions: a Canadian experience. *J Trauma.* 1996; 41:708.

11. Holland AJ, Cass DT, Glasson MJ, Pitkin J. Small bowel injuries in children. *J Paediatr Child Health.* 2000; 36:265.

12. Lutz N, Nance ML, Kallan MJ, et al. Incidence and clinical significance of abdominal wall bruising in restrained children involved in motor vehicle crashes. *J Pediatr Surg.* 2004; 39:972.

13. Ameh EA, Chirdan LB, Nmadu PT. Blunt abdominal trauma in children: epidemiology, management and management problem in a developing country.

14. National Pediatric Trauma Registry. Available at: <http://www.nptr.org>. Accessed April 29.

15. Holmes JF, Sokolove PE, Brant WE, et al. Identification of children with intra-abdominal injuries after blunt trauma. *Ann Emerg Med.* 2002;39(5):500–509.
16. Johnson C, Riveria FP, Soderberg R, et al. Children in car crashes: analysis of data for injury and use of restraints. *Pediatrics* 1994;93:960– 965.
17. Howard A, McKeag AM, Rothman L, et al. Ejections of young children in motor vehicle crashes. *J Trauma.* 2003;55:126– 129.
18. Medscape [Internet]. New York: Blunt abdominal trauma. [updated Aug 19 2014; ]. Available from: <http://emedicine.medscape.com/article/1980980-overview>.
19. Alli N. Management of blunt abdominal trauma in Maiduguri: a retrospective study. *Niger J Med.* 2005; 14(1): 17-22.
20. Ramesh BH., Sch. J. *App. Med. Sci.* 2014; 2(1C):332-335.