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Original Research Article

Patients with Blunt Abdominal Trauma: Results of a prospective and hospital based study

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Abstract: Blunt abdominal trauma (BAT) has become a major health problem all around the world mainly in low and middle-income countries.The objective is to study the incidence, reasons and outcome of BAT in order to diagnose it properly and to start early intervention to decrease associated morbidity and mortality. It was a prospective study including patients who had history of blunt trauma to abdomen, presented in the Department of Surgery, MGM Medical College and Emergency Surgery and Trauma Department, M.Y. Hospital Indore from Sept., 2012 to Sept., 2014. Detailed history, mode of trauma, treatment given, extra abdominal injuries, clinical presentation, internal organ injuries, hospital stay, associated complications and morbidity parameters were studied in all the patients.A total of 134 patients were admitted during the study period, out of which 54, 50 and 30 were admitted in 2012, 2013 and 2014 respectively. There was male predominance, involving mostly patients with age group between 20-30 years. Road traffic accidents were the most common cause of BAT. Most of the patients in 2012 were treated conservatively but in 2013 and 2014 surgical intervention was required in many of patients. Injuries of head and chest were the common extra abdominal injuries, in abdomen small intestine was damaged in majority of patients. Most of the patients stayed for 7 to 12 days in the hospital and though 24 (17.91%) patients died due to severity of the trauma, 104 (77.61%) recovered without any complications.The BAT is preventable as the road accidents are the major cause. Sound judgment with effective treatment and surgical expertise can improve the survival of patients with BAT.
Keywords:blunt abdominal trauma, road traffic accidents, abdominal injuries

INTRODUCTION

Trauma especially road traffic injury is one of the major health related issue throughout the world especially in developing countries like India [1]. Road traffic accidents still remains the one of the top reason for blunt abdominal trauma (BAT), other causes of BAT include recreational accidents, fall and assault [2].

BAT is very common and the prevalence of intra-abdominal injury after BAT range from 12% to 15% [3, 4]Diagnosis of BAT can be done using physical examination, ultrasonography, computed tomography (CT), laparoscopy, laparotomy and using different laboratory tests [5].

Data from the different study had shown a high mortality in patients with BAT especially when patients is having multiple solid organ injury[6, 7]. Duringsurgery risk of deathincreases by 4.4 times in patients with solid organ injury.[7] In order to salvage patients from such abdominal trauma, rapid resuscitation is needed [6].

Several old studies have recommended an observation period of 23 hours following BAT; nevertheless, the optimal observation duration is still unknown [8].

Hence, present study was done to find out the incidence, reasons and outcome of BAT in order to diagnose it properly and to start early intervention to decrease associated morbidity and mortality.

MATERIALS AND METHODS

The present prospective study included patients who presented with history of blunt traumato

the abdomen, in the Department of Surgery, MGM Medical College and Emergency Surgery and Trauma Department, M.Y. Hospital Indorebetween Sept., 2012 to Sept., 2014.

A Written informed consent from all the patients and Ethical Committee approval was obtained before starting the study.

Detailed historyof patients including the length of delay in treatment taken and nature of trauma including weapon responsible for trauma was recorded. Conscious patients without any alcoholic and narcotic drug consumption were asked thedetailed history including all presenting symptoms and exact site of injury.

Those patients who sustained injury due to assault by fists and blows,lathi,iron rods/kicks or received accidental animal kicks over abdomen or got injured due to fall of some heavy object like log,gravel, got buried in mine or had rolled down the stairs or stumbled over some blunt object and were resuscitated in the casualty and admitted to the wards and subjected to appropriate management and the admitted patient who died during the treatment were included in the present study.

Patient who reported to hospital with history of blunt abdominal trauma but on examination showed no distant symptoms and sign of abdominal injury, and/or given conservative line of treatment, and in due course showed improvement, without any deterioration and not admitted in hospital were excluded from the present study.

If patient was in the state of shock often with presence of internal injury, his cardio respiratory status was assessed and recording of vital sign was made immediately and in order of priority, establishment of adequate ventilation, control of major hemorrhage done.

Insertion of central line and cross match for blood transfusion was done simultaneously. Rapid I.V. bolus of crystalloid solution, dextran and blood was given as required.

With respiratory and circulatory efficiency resorted, vital sign recording continued at 15 minute intervals. Detailed physical examination and local examination was performed.

The wound was covered by occlusive dressing. Foley's catheter inserted for recording hourly output and urine sampling to evaluate the integrity of urinary track.A Ryle's tube was inserted for nasogastric suction whenever necessary in abdominal injury.

Resuscitation was continued throughout the period of evaluation until a treatment plan, surgery or observation was established.

The external injury was noted in detail and finding such as surgical emphysema, active bleed peritoneal/pleural breech, evisceration, guarding& rigidity in abdomen on palpation were recorded.

Laparotomy was performed on selective patients who showed parietal peritoneal breech, evisceration of either bowel or omentum and any foreign body felt per abdomen.

All the data were analyzed using IBM SPSS-ver.20 software. Analysis was performed using chi-square test and independent sample student t test. P values <0.05 was considered to be significant.

RESULTS

The total admissions to the surgery dept. were 6204, 6794 and 5572 out of which 54, 50 and 30 patients were found to have BAT (incidence being 0.87%, 0.74% and 0.54% respectively) in 2012, 2013 and 2014 respectively.

Out of 134 BAT patients, 112 (83.58%) were male and 22 (16.42%) were female. The distribution of various factors in patients of BAT are given in table 1.The mode of trauma is given in figure 1.

DISCUSSION

BAT is still one of the major reasons of trauma admission throughout world. It also significantly leads to high morbidity and mortality [9].

In harmony with other studies done by Manohar *et al*, Asuquo *et al*, Kulkarni *et al* andChalya *et al*, most of the patients with BAT in present study were young in their second and third decade of life and involved males more as compared to female [9-12].

Patients having age between 20-30 year represents the economically active group and this is the reason why there is a high incidence of BAT in this age group. The reason behind the male predominance in present study is due high engagement of men in high-risk activities. In most of the Indian household male population are bread earners and likely to involve in such activities which can lead to injuryin pursue of attempting to earn a living.

Asuquo *et al* performed a similar study on 19 BAT patients and reported road traffic accidents as the most common cause for BAT which is consistence with the findings of present study [10, 13]. Study done by Kulkarni et al including 68 consecutive cases of blunt trauma and another study done by Jolly et al also

reported road traffic accident as the most common cause of BAT [11, 14].

Srihari et al performed a similar study and revealed that among all BAT patients most of them were managed surgically whereas only 31.6% were treated conservatively.Similarly, in present study most of the patients were treated conservativelyin 2012 but trend was shifted to surgical intervention during 2013 and 2014 which is similar to the reports by Srihari *et al*. [6].

Head injury and chest were the most common extra abdominal injuries in present study and most of the patients presented with localized tenderness which is consistence with the study performed by Chalya *et al*. [12].Damage to the visceral organ or fatal hemorrhage in BAT patients makes it one of the important types of trauma which require correct diagnosis along with early intervention. Doing so may reduce the chances of death and associated morbidity [11, 15]. In present study small intestine was the most commonly involved internal organ which is consistent with the study done by Kulkarni S 2015 [11].

Laparotomy was performed in patients to locate and repair injured organ, to clean peritoneal cavity and to look over for any other abdominal cavity injuries. In present study haemoperitonium was the most commonly observed intra-operative finding, similar results were reported by Chalya *et al.*, [12].

Srihari *et al* reported 13.33% mortality in their study and septicemia being the most common cause of death. In present study most common complication was wound infectionfollowed by septicemia, the mortality was 11.10 %, 26 % and 16.65 %in year 2012, 2013 and 2014 respectively.Similar results were reported by Naveen *et al* and Srihari *et al*., [6, 16].

In present study there was a decline in the incidence of BAT from 2012 to 2014 which may be due to combination of factors including increase in effective road safety policies and decrease in violence in urban area which is consistence with the study done by Asuquo *et al*., [10].

Table 1: Distribution of patients according to incidence of various factors of BAT

Factors		2012; n=54 (%)	2013; n=50 (%)	2014; n=30 (%)
Age	0-10	5 (9.26)	6 (12)	0 (0)
	11-20	12 (22.22)	9 (18)	7 (23.33)
	21-30	13 (24.07)	14 (28)	7 (23.33)
	31-40	11 (20.37)	11 (22)	10 (33.33)
	41-50	2 (3.70)	7 (14)	5 (16.66)
	51-60	9 (16.66)	2 (4)	0 (0)
	>60	2 (3.70)	1 (2)	1 (3.33)
Treatment	Conservative	32 (59.29)	23 (43)	12 (40)
	Operative	22 (40.71)	27 (54)	18 (60)
EAI	Head Injury	15 (27.77)	8 (16)	8 (26.66)
	Chest	16 (29.62)	13 (26)	3 (9.99)
	Facial	1 (1.85)	8 (16)	0 (0)
	Pelvis	4 (7.40)	2 (4)	1 (3.33)
	Extremity	1 (1.85)	3 (6)	0 (0)
CP	Shock	4 (7.40)	12 (24)	2 (6.66)
	P/A Guarding tenderness	16 (29.62)	20 (40)	10 (33.33)
	Respiratory distress	14 (25.92)	10 (20)	5 16.66)
	Localized tenderness	18 (33.33)	15 (30)	10 (33.33)
	Neurological sign	18 (33.33)	6 (12)	7 (23.33)
IOI	Liver	4 (7.40)	12 (24)	3 (9.99)
	Small intestine	6 (11.10)	15 (30)	6 (20)
	Spleen	4 (7.40)	9 (18)	4 (13.33)
	Hemoperitoneum	15 (27.77)	23 (46)	17 (56.61)
	KUB	2 (3.70)	4 (8)	3 (9.99)
	Other*	0 (0)	3 (6)	1 (3.33)

Data is expressed as no of patients (%), MOT; mode of trauma, RTA; road traffic accidents EAI; extra abdominal injuries, CP; clinical presentation, IOI; internal organ injuries, KUB; kidney, ureter and bladder, FBO; falling blunt object over body, *stomach,pancreas and colon

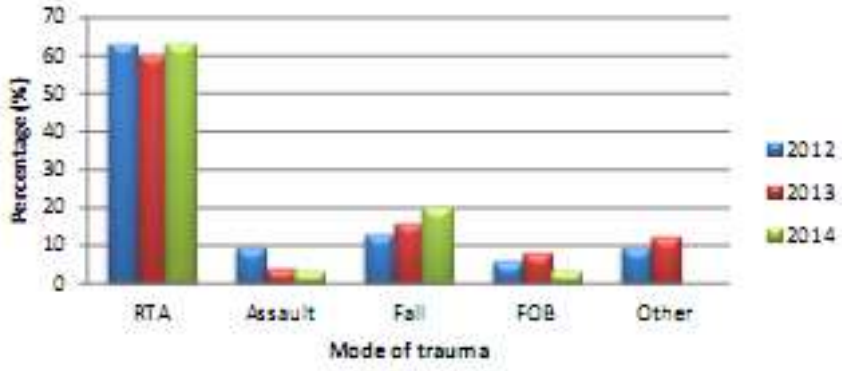

Fig-1: Mode of trauma responsible for BAT

Table 2: Distribution of patients according to other parameters

Parameters		2012; n=54 (%)	2013; n=50 (%)	2014; n=30 (%)
Hospital Stay (Days)	0-3	17 (31.48)	10 (20)	11 (36.67)
	4-6	12 (22.22)	11 (22)	3 (9.99)
	7-12	20 (37.03)	23(46)	15 (49.95)
	>12	5 (9.26)	6 (12)	1 (3.33)
LP	Liver Repair	1 (1.85)	3(6)	2 (6.66)
	ROP	6 (11.10)	10(20)	4 (13.32)
	RA	2 (3.70)	3 (6)	1 (3.33)
	Splenectomy	2 (3.70)	0 (0)	0 (0)
	EH	8 (14.8)	7 (14)	5 (16.65)
	KR & SPC	2 (3.70)	1 (2)	2 (6.66)
	Other*	0 (0)	4 (8)	1 (3.33)
Complication	WI	0 (0)	2(4)	2 (6.66)
	Septicemia	0 (0)	4 (8)	0 (0)
	Burst abdomen	0 (0)	1 (2)	0 (0)
	Other^	0 (0)	0 (0)	0 (0)
Outcome	Death	6 (11.10)	13 (26)	5 (16.65)
	IWOC	48 (88.89%)	33 (66)	23 (76.59)
	IWC	0 (0)	4 (8)	2 (6.66)

Data is expressed as no of patients (%), ROP; repair of perforation, RA; resection & anastomosis, EH; evacuation of hemoperitoneum; KR &SPC :Kidney Repair & Supra Pubic catheterization PC, WI; wound infection, IWOC; Improved without complication, IWC; improved with complication; M & M; mortality and morbidity, LP; laprotomy procedure*mesenteric/diaphragm tear repair/ ileostomy/colostomy;^ DVT, PulmComplication, Hepato/renal Complication, bed sore

In present study wound infection [4 (16.66%)] was the most common complication followed by septicemia [2 (8.33%)]. The majority of patients stayed for 7 – 12 days in the hospital. The mortality in 2012, 2013 and 2014 was 11.10 %, 26 % and 16.65 % respectively.

CONCLUSION

Average incidence of BAT in present study was 0.72% with male predominance. Most of the patients were in young age. Head injury and chest were the most common extra abdominal injuries, small intestine was mainly damaged, most of the patients stayed for 7 to 12 days in the hospital. Majority of patients recovered without any complications.Present study has few limitation of being small in size; a large randomized clinical trial is required to confirm the results.

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