



Profile of Acute Surgical Abdomen and Their Management –A Prospective Study in a Teaching Hospital

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Introduction

Acute abdomen is one of the commonest causes of admission in the surgical emergency room, and it encompasses a spectrum of surgical conditions, which requires hospital admission, thorough investigations and prompt treatment in the form of surgical intervention except in few cases, where conservative management is preferred to avoid an unnecessary and difficult surgery (**Haworth IE, 1992**).

Pain, the most common presenting symptom may be located in any quadrant of the abdomen and its location is a useful starting point that should guide further workup. Similarly, character, nature and intensity of the pain also indicate indirect evidence of underlying cause of acute abdomen. Colicky pain is typically associated with obstructive processes, while pain that is continuous is usually the result of underlying ischemia or peritoneal inflammation (**Brewer RJ, Golden GT and Hitch DG, 1976**).

The pattern of radiation of pain may provide important clues as to its origin. Pain that involves the entire abdomen almost immediately after onset

is usually due to flooding of the peritoneal cavity with an irritating fluid from a perforated ulcer, or from blood and chorionic tissue in a ruptured ectopic pregnancy (**Kamin RA, Nowicki TA, Courtney DS, et al., 2003**).

The important signs of acute surgical abdomen are the abdominal guarding, rigidity and rebound tenderness. Guarding is a characteristic finding in the physical examination for an abruptly painful abdomen (an acute abdomen) with inflammation of the inner abdominal (peritoneal) surface wherein, the tensed muscles of the abdominal wall automatically go into spasm to keep the tender underlying tissues from being disturbed (**Leung AK and Sigalet DL, 2003**).

Age differences play a crucial role and are important to be considered when assessing the acute abdomen. As with age not only the incidence of certain pathologies changes but also the clinical presentation varies.

The most important tools aiding in the evaluation of the acute abdomen are a detailed patient history and an accurate physical examination. Although in most cases this is not enough to make a safe

diagnosis, which makes further laboratory and imaging studies indispensable (Silen W, 2010).

Various laboratory studies can be used as adjuncts to help narrow down the differential, or to confirm or rule out a diagnosis.

Radiologic imaging plays a key role in the evaluation and management of the acute abdomen. Plain films, ultrasonography (USG), computed tomography (CT), and magnetic resonance imaging (MRI) are the most common imaging modalities employed in the diagnostic workup of these patients.

In the evaluation of patients presenting with acute abdominal pain, the surgeon must first determine whether operative intervention is necessary, and whether it should be pursued on an immediate or emergent basis or within a few hours of a patient's arrival. Treatment algorithms are beneficial in helping to make such decisions (Hustey FM, 2005).

In some cases, a short delay to fully correct any fluid and electrolyte abnormalities may prove to be beneficial. In others, immediate operative intervention is necessary for stabilization of a patient's condition especially in intestinal ischemia or infarction, and continued hemodynamic instability despite aggressive resuscitative measures (Henderickson M and Naparst TR, 2003).

The outcomes of patients presenting with an acute abdomen are also influenced by the underlying etiology, age, co-morbid conditions, and the time to diagnosis and treatment (Flasar MH and Goldberg E, 2006)

This part of the country and our health institution is a high-volume center, as far as acute surgical abdomen, both traumatic and non-traumatic is concerned. Furthermore, majority belongs to low socio-economic status and there is paucity of literature on the subject, as far as this region is concerned. The study was undertaken to assess profile of acute surgical abdomen and management offered thereof. An attempt has been made to work out grey areas in the management available, paucity of resources and to suggest

accordingly in the better interest of the patient. The results of study are detailed herein the thesis.

Materials and Methods

The study was conducted in the Postgraduate Department of Surgery, GMC Jammu over a period of one year w.e.f. November 2015 to October 2016. Patients admitted in surgical emergency with acute surgical abdomen were included in the study by applying the following inclusion and exclusion criteria.

Inclusion Criteria

- Patients of all ages and both sexes with acute surgical abdomen requiring admission to hospital.
- Acute abdomen as a result of blunt trauma abdomen

Exclusion Criteria

- Patients with abdominal pain due to medical causes like non-biliary pancreatitis, chronic liver diseases, acute gastroenteritis and myocardial infarction.
- Patients presenting with acute abdomen that was later found to be due to gynecological conditions.

Data was collected from the hospital record file with patient's particulars, proper history, clinical examination, investigations, diagnosis and surgical procedures undertaken.

All the data was subjected to statistical analysis with the help of biostatistician of Medical College.

Results

A total number of 1224 patients, with acute surgical abdomen of all ages and both sexes admitted in surgical ward formed the basis of the study. The study included 666 (54.41%) male patients and 558 (45.59%) female patients. The observations made in the study have been detailed below.

Table 1: Age and Sex distribution of Patients

Age group (in years)	Male		Female		Total	
	No.	%	No.	%	No.	%
<10	48	3.92	24	1.96	36	5.88
11 – 20	56	4.57	76	6.20	64	10.77
21 – 30	104	8.50	128	10.45	116	18.95
31 – 40	104	8.50	115	9.40	106	17.90
41 – 50	112	9.15	88	7.19	100	16.33
51 – 60	100	8.16	52	4.25	76	12.41
61 – 70	92	7.51	48	3.92	70	11.43
71 – 80	44	3.60	24	1.96	34	5.55
>81	6	0.50	7	0.57	10	1.07
Total	666	54.41	558	45.59	1224	100.00

Table 2: Distribution of Patients according to Symptoms

Symptoms*	Total	
	No.	%
Abdominal pain	1224	100.00
Vomiting	512	41.83
Abdominal distension	408	33.33
Fever	296	24.18
Constipation	228	18.62
Jaundice	128	10.45
Hematuria	72	5.88

(*More than one symptom present in single patient)

Table 3: Distribution of Patients according to Abdominal Signs

Abdominal Signs*	Total	
	No.	%
Tenderness	1188	97.05
Guarding	684	55.88
Rigidity	358	29.24
Rebound tenderness	350	28.59

(*More than one sign elicited in single patient)

Table 4: Distribution of Patients according to Co-morbid conditions:

Co-morbid conditions	Total	
	No.	%
Hypertension	96	7.84
Diabetes mellitus	78	6.37
Respiratory illness	66	5.39
Cardiac illness	58	4.74
Past history of surgery	60	4.90

Table 5: Distribution of Patients into Traumatic and Non-Traumatic causes of acute abdomen

Causes of acute abdomen	Male	Female	Total
	No. (%)	No. (%)	No. (%)
Trauma	198 (16.17%)	80 (6.53%)	278(22.71)
Non-trauma	502 (41.01%)	444 (36.27%)	946 (77.28)

Table 6: Distribution of patients according to mode of management (n=1224)

Mode of management	Trauma		Non-Trauma	
	No.	%	No.	%
Conservative	208	74.82	508	53.70
Surgical	70	25.18	438	46.30
Total	278	100.00	946	100.00

Table 7: Distribution of Patients managed surgically in trauma related acute surgical abdomen (n=70):

Injury	Surgery offered	No of patients	%age
Spleen	Splenectomy	30	10.79
Liver	Hepatorraphy	22	7.91
Gut	Resection anastomosis	5	1.79
Mesenteric	Repair of Mesenteric tear	4	1.43
Urinary Bladder/ urethral	Repair/SPC	4	1.43
Diaphragmatic	Laparotomy with Repair	3	1.07
Pancreatic injury	Laparotomy with Repair	2	0.71

Table 8: Distribution of patients managed conservatively in trauma related acute surgical abdomen (n=208):

Diagnosis	Male		Female		Total	
	No.	%	No.	%	No.	%
Splenic Injury	60	28.84	26	12.5	86	41.34
Liver Injury	14	6.73	8	3.84	22	10.58
Renal Injury	30	14.42	15	7.21	45	21.64
Retroperitoneal Hematoma	20	9.61	12	5.76	32	15.38
No cause detected	16	7.69	7	3.36	23	11.05
Total	140	67.31	68	32.69	208	100

Table 9: Distribution of non-traumatic acute abdomen patients according to diagnosis (n=946, 77.3%)

Diagnosis	Male		Female		Total	
	No.	%	No.	%	No.	%
Acute appendicitis	86	17.13	84	18.91	170	17.96
Intestinal obstruction	58	11.50	100	22.52	158	16.70
Acute cholecystitis	84	16.73	50	11.26	134	14.16
Perforation peritonitis	130	25.90	60	13.53	190	20.08
Acute biliary pancreatitis	48	9.50	74	16.66	122	12.89
Non-specific abdominal pain	28	5.57	46	10.36	74	7.82
Ureteric colic	40	7.97	24	5.40	64	6.76
Acute urinary retention	16	3.18	0	0	16	1.69
Liver abscess	12	2.39	6	1.35	18	1.90
Total	502	100	444	100	946	100

Table 10: Distribution of non-traumatic patients managed surgically (n=438)

Surgical management	No.	%
Open appendicectomy	150	34.24
Omental patch closure of duodenal ulcer perforation	140	31.96
Exploratory laparotomy for intestinal obstruction	88	20.09
Exploratory laparotomy with primary closure of ileal perforation	25	5.70
Exploratory laparotomy with resection of unhealthy ileal segment with formation of stoma	10	2.29
Exploratory laparotomy with drainage of liver abscess	10	2.29
Suprapubic cystostomy	10	2.29
Placement of drain under local anesthesia	5	1.14
Total	438	100.00

Table 12: Various causes of intestinal obstruction that required surgical intervention (n=88)

Intestinal obstruction	No.	%
Adhesion obstruction	32	36.36
Volvulus	12	13.64
Food bolus obstruction	12	13.64
Obstructed inguinal hernia	10	11.36
Ascending /Descending/Sigmoid growth	10	11.36
Rectal growth	8	9.09
Meckel's diverticulum with fibrotic band obstruction	4	4.54
Total	88	100.00

Table 13: Distribution of patients according to complications

Complications	Surgical		Conservative	
	No.	%	No.	%
(a) Non-traumatic	(n=438)		(n=508)	
Surgical site infection	46	10.55	-	-
Wound dehiscence	22	5.02	-	-
Pleural effusion/atelectasis	20	4.56	17	3.34
Septicemia	14	3.19	10	1.96
Renal failure	8	1.82	5	0.98
Duodena blow out	5	1.14	-	-
Anastomotic leak	5	1.14	-	-
Jaundice	-	-	3	0.59
(b) Traumatic	(n=70)		(n=208)	
Pleural effusion/atelectasis	4	5.71	4	1.92
Septicemia	2	2.90	0	0.00
Renal failure	2	2.90	0	0.00
Jaundice	-	-	2	0.96

Table 14: Distribution of patients according to outcome in the study (n=1224)

Outcome	Non-Trauma (n=946)				Trauma (n=278)			
	Conservative (n=508)		Surgical (n=438)		Conservative (n=208)		Surgical (n=70)	
	No.	%	No.	%	No.	%	No.	%
Discharged satisfactorily	504	98.89	433	98.67	206	99.03	69	98.57
Expired	06	1.19	8	1.83	2	0.97	1	1.43
Total	508	100.00	438	100.00	208	100.00	70	100.00

The overall mortality of our study was 17 (1.39%) patients, which included 14 (82.35%) patients of non-traumatic cause of acute abdomen and 3 (17.64%) patients of traumatic cause of acute abdomen. Among the non-traumatic causes, perforation peritonitis has been the most common cause of mortality. A total of 3 patients of perforation peritonitis who presented late, expired while still undergoing optimization/resuscitation due to Septicemia/MODS. Whereas 3 patients of perforation peritonitis with Septicemia/MODS expired in the immediate post-operative period. Two patients each (11.76%) of duodenal blow out,

anastomotic leak and acute severe pancreatitis expired in our study.

Among the traumatic causes of mortality, 2 (11.76%) patients expired while on conservative management. One patient had hepatic injury while the other had splenic injury as the cause of mortality. And another patient of laparotomy with repair of pancreatic injury expired in the immediate post-operative period.

Discussion

A total of 1224 patients of acute surgical abdomen, both traumatic and non-traumatic causes, were included in the present study.

In our study, majority of the patients were in the age group of 21-30 years (18.95%), followed by 31-40 years (17.90%) and 41-50 years (16.33%). Whereas, age distribution in a similar study conducted by **Samir Ray et al., (2015)** in their series of 110 patients, found that majority of the patients were in the age group of 11-20 years (26.46%), followed by 21-30 years (22.81%) age group.

Our study also revealed that the rate of having co-existing medical disease in the aged patient was more than 25 % and hypertension (7.84%) was the most common comorbidity, followed by diabetes mellitus (6.37%), COPD (5.39%) and chronic heart disease (4.74%). Another study by **Chanana L et al., (2015)**, observed that comorbid conditions like diabetes mellitus, hypertension, ischemic heart disease and chronic pancreatitis were present in 15.20%, 14.80%, 2.30% and 1.90% of patients respectively.

In our study 60 (4.90%) patients had a history of abdominal surgery in the past. About 15% of patients had a past history of abdominal surgery in the study of **Chanana et al., (2015)** on a series of 264 patients. And 6.8% of patients had a history of previous abdominal surgery, in the study of **Samir Ray et al., (2015)**.

Though the majority of the patients in our study were non-traumatic acute surgical abdomen, however our hospital being a high-volume trauma center in the region, had a large number of patients being admitted for traumatic cause of acute surgical abdomen. Out of a total of 1224 patients of acute surgical abdomen, non-traumatic causes of acute surgical abdomen were 946 (77.28%) and traumatic causes of acute abdomen were 278 (22.71%). In a study by **Doumi EBA and Mohammad MI (2002)**, patients with traumatic acute abdomen constituted 11.60%, while non-traumatic acute abdomen constituted the remaining 88.40%.

Amongst all the cases of non-traumatic acute surgical abdomen in our study i.e., 946 (77.28%) patients, 508 (53.70%) patients were managed conservatively, whereas 438 (46.30%) patients

underwent surgical intervention. And out of a total of 278 traumatic acute abdomen cases, 208 (74.82%) patients were managed conservatively and 70 (25.18%) patients underwent surgical intervention. **Agboola JO et al., (2014)** in their study on 276 patients of acute surgical abdomen, observed that a total of 258 (93.48%) were non-traumatic acute abdomen cases and 18 (6.5%) patients had traumatic causes of acute surgical abdomen. Amongst the non-traumatic cases of acute abdomen in their study, a total of 109 (42.24%) patients were managed conservatively, whereas 149 (57.75%) patients underwent surgical intervention. Out of a total of 18 patients of abdominal trauma, 10 (55.55%) patients had to undergo surgery in their study while the rest were managed conservatively.

Therefore, the increased incidence of blunt trauma abdomen (22.71%) with resultant solid organ injury as well as gastro-intestinal perforation due to it, in the present series and 21% in another study by **Bose et al., (1986)** at PGIMER Chandigarh, may be due to the higher incidence of road traffic accidents.

Out of a total of 70 patients who underwent surgical intervention following blunt trauma abdomen in our study, the pattern of involvement of abdominal viscera and the surgeries performed are, splenectomy (10.79%), followed by hepatorrhaphy (7.91%), resection anastomosis of gut injury (1.79%), repair of bladder/urethral injury and mesenteric injury (1.43%) each. The pattern of involvement of abdominal viscera in our study is also comparable to the study of **Doumi EBA and Mohammed MI (2009)**, where they observed, splenic injury to be the most frequent cause (54%), followed by liver injury (32%).

Out of a total of 278 patients of trauma related acute surgical abdomen, 208 (74.82%) patients were managed conservatively. It included 86 (41.3%) patients with different grades of splenic injury (Grade I-IV), 45 (21.64%) patients with different grades of renal injury and 22 (10.58%) patients with different grades of liver injury

(Grade I-IV). Whereas, no available literature mentioned the distribution of patients of traumatic acute abdomen, being managed conservatively.

On the other hand, the most common causes of non-traumatic acute abdomen in our study was perforation peritonitis 20.08% followed by acute appendicitis 17.96% and intestinal obstruction 16.70%.

Khanna AK and Mishra MK, 2006 from Varanasi in their study of 208 cases of acute surgical abdomen, observed that exploratory laprotomy for perforation peritonitis was the most common surgical intervention, performed in 108 (51.90%) cases of ileal perforation. It was followed by omental patch closure of duodenal ulcer perforation in 58 (27.88%) patients and open appendicectomy in 19 (9.13%) patients.

While in our study, the most frequent operation performed was open appendicectomy in 150 (34.24%) patients, followed by exploratory laparotomy with omental patch closure of duodenal ulcer perforation in 140 (31.96%) patients. Whereas exploratory laparotomy for intestinal obstruction was carried out in 88 (20.09%) patients and primary closure of ileal perforation was done in 25 (5.70) patients.

Among the causes of intestinal obstruction, adhesion obstruction was the leading cause of obstruction in our study (36.36%). Followed by volvulus and food bolus obstruction, each comprising (13.64%).

In a study done by **Adhikari S in 2010** which comprised of 367 cases, showed post-operative adhesions as the most common cause of obstruction (38.6%). **Sinha S in 2002** studied 97 cases in Chandigarh and he also observed adhesions as the major cause of obstruction (32.64%).

The most common complications in the surgically managed patients in our study were surgical site infections (10.50%), followed by septicemia (5.15%) and wound dehiscence (5.02%). Whereas respiratory complications (pneumonia, atelectasis, pleural effusion or ARDS) were observed in both

surgically as well as conservatively managed patients (7.9%).

Whereas surgical site infection (6.7%) and septicemia (5.7%) were the most frequent complication in patients undergoing emergency gastro-intestinal surgery in a study conducted by **McCoy CC et al., (2015)** as a part of the American College of Surgeon's National Surgical Quality Improvement Program database.

Unacceptably high incidence of abdominal wall disruption (5.02%) in the present series was multifactorial due to delayed presentation, gross contamination of peritoneal cavity with septicemia and also the patient factors (low nutritional built, severe anemia, hypoproteinemia to name a few).

The overall mortality in our study was 17 (1.39%) patients. In non-trauma, conservatively managed group 06 patients (1.19%) died during the course of management, whereas; in surgical group 8 patients (1.83%) died after surgery. Similarly, in trauma related conservatively managed patient 2 (0.97%) died during conservative management, whereas; 1 patient (1.43%) died after surgery in trauma group.

Conclusion

The term acute abdomen designates symptoms and signs of intra abdominal diseases usually treated best by surgical intervention but not invariably by operation. Trauma as a cause of acute abdomen of late has contributed as an important cause. The proper management of patients with acute abdominal pain requires a timely decision about the need for surgery. The most appropriate therapy should then be initiated with the patients clinical status optimized. Beginning with a thorough but efficient acquisition of the patient's history and physical examination and followed by the judicious use of laboratory and radiological studies.

The data available from the study reveals that acute surgical abdomen is a disease of productive years of life and majority of patients reporting to our institution belongs to the lower socioeconomic strata, probably it being a government institution.

Most common cause of presentation in the study was perforation peritonitis followed by acute appendicitis and intestinal obstruction. Trauma related acute surgical abdomen constituted one – fourth of the patients, only 25.18% requiring surgery and rest managed conservatively. Non-trauma acute surgical abdomen constituted three-fourth of the patients and 46.30% requiring surgery. Mortality in the group was 1.39% attributed to late presentations and surgery related problems. Ours is a government run health institution and majority of the patients reported to the hospital belongs to lower socioeconomic setup, there is need to introduce minimally invasive equipments and machinery to upgrade the existing infrastructure. Also the government should focus on developing trauma as a separate speciality in view of increasing number of trauma related acute abdomen. Doctors and supporting staffs need to be trained accordingly to deal with trauma related acute surgical abdomen more effectively and efficiently.

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