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Original Research Article

A descriptive study of emergency exploratory laparotomy cases operated at SMS hospital Jaipur

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Abstract: Despite being one of the most common urgent surgical procedures, emergency exploratory laparotomy still proves to be a challenge for the surgeons around the world. This study was done to present the clinico-demographic profile of emergency laparotomies performed in our institution, to investigate the etiological profile with the assessment clinical outcomes and to find out proportion and type of co-morbidity in abdominal emergencies and its association with clinical outcomes.
Keywords: Acute Peritonitis, Intestinal obstruction/SAIO, and Abdominal trauma.

INTRODUCTION

The group of patients with the highest mortality are those undergoing emergency exploratory laparotomy which constitute one of the high-risk groups of the patients that a surgeon need to operate and manage.

Elective laparotomy indirectly implies that there is ample time for preoperative assessment and preparation of the patient while in emergency, exploratory laparotomy procedure for which the clinical presentation, underlying pathology, anatomical site of surgery, and perioperative management vary considerably. In general terms, it is a procedure in which the abdomen is opened and the abdominal organs examined for injury or disease. Once the underlying pathology has been determined or confirmed, it is continued as a therapeutic procedure with curative or damage control intent. The variation in surgical pathology, coupled with the limited time period in which to optimize co-morbidities, contributes significantly to postoperative morbidity and mortality[1, 2].

Acute onset abdominal pain with some peculiar clinical findings may be suggestive of intra-abdominal pathology necessitating emergency surgery. Patients with clinical features of peritonitis may have pneumoperitoneum on erect chest and abdominal radiographs. Patients with vomiting, obstipation, and abdominal distension are likely to have intestinal obstruction and in abdominal radiographs these patients may reveal dilated intestinal loops and air-fluid levels. Patients with pain in the abdomen and fever may have intra-abdominal collection detected by means of ultrasonography or computed tomography (CT) and can often be diagnosed percutaneous aspirations.

Abdominal trauma with hemoperitoneum and hemodynamic instability should undergo exploratory laparotomy without any delay. They are likely to have intraperitoneal bleeding after injury to the liver, spleen, or mesentery. They may also have associated intestinal perforations that call for emergency repair[4, 5].

In patients with penetrating abdominal trauma (PAT), exploratory laparotomy was conventionally carried out to rule out intra-abdominal injury. However, now with new diagnostic tools such as laparoscopy and abdominal CT scan, emergency laparotomy is not indicated in all patients [9].

MATERIALS AND METHODS

After approval of the ethical committee, the study was conducted in department of general surgery; S.M.S hospital Jaipur Rajasthan. It was a hospital based descriptive type of observational study. This study lasted for one year with 6 month follow up period.The study was conducted on 150 subjects with 95%

confidence limit and 20% relative allowable error. Study was performed on every eligible case that was explored as laparotomy in emergency fulfilling the inclusion and exclusion criteria. All the patients who were above 12 yrs. and have given written consent for study were included in this study whereas pregnant females and the patients operated for obstructed hernia and simple appendectomy was excluded.

The treatment policy in our hospital in exploratory laparotomy was opening the abdomen from the midline and proceeding according to the situation. Standard post-operative care was provided to each patient. In case of uneventful recovery patients were discharged from hospital. If patient had complication they were managed accordingly. All the patients were followed up regularly after surgery and thereafter for six months or as per requirement.

Qualitative data was expressed in the form of percentage and proportions and quantitative data in the form of mean +S. D. Significance in difference in proportion was assessed by Chi Square test and in means by unpaired‘t’ test / ANOVA as per data yield. For significance p value <0.05 was considered significant.

RESULTS

In this study 150 patients of emergency exploratory laparotomy were included with male to female ratio of 4:1 and mean age of 41.02 years.

According to duration of symptoms in our study, patients who reported within 48 hrs were less 19(12.7%) in comparison to the patients reporting after 48 hrs 131(87.3%). Patients who reported within 48 hrs were maximum proportion in traumatic (73.6%) followed by peptic ulcer disease type of perforation followed by tubercular, appendicular, strangulation, ileal pathology.

Peptic perforation peritonitis 36(25%) was most common etiology followed by ileal perforation 25(16.7%), SAIO (due to band and adhesion) 23(15.3%), abdominal trauma 19(12.7%) and all others. Contribution of appendicular perforation / abscess (6%) gut gangrene (3.3%), ruptured liver abscess (3.3%), Koch's abdomen (3.3%) was less.

The non-traumatic patients presented late (96%) with well-established peritonitis (septicemia) and deranged vitals, dehydration, derange blood investigations causing increase mortality as well as morbidity.

Despite aseptic environment and good antibiotic coverage morbidity and mortality was still higher. Patients advancing age, late presentation, associated co-morbid condition, pre-operative shock, routine biochemical blood investigation changes, delayed diagnosis, resuscitation and treatment and fecopurulent peritoneal exudates were significantly affecting morbidity and mortality.

Table 1: Early complication associated with Different emergencies

Early Complications **Diagnosis (Total)**	**Fever**	**Cough/ pneumonia**	**Nausea / Vomiting**
A Acute Peritonitis			
1.Appendicular perforation/abscess(9)	6	1	2
2.Colonic perforation(1)	1	0	0
3.Pelvic abscess(1)	0	0	0
4.GB perforation(5)	0	2	0
5.Gut gangrene(5)	5	3	0
6.Ileal perforation(25)	15	9	6
7.Peptic perforation(36)	7	5	3
8.Ruptured liver abscess(5)	4	1	3
B. Intestinal obstruction/SAIO			
1.Band / adhesion(23)	8	10	0
2.Intussusception(4)	1	1	1
3.SAIO others(7)	2	1	2
4.Tubercular(5)	4	5	0
5.Volvulus(4)	2	1	0
C. Abdominal trauma			
1.Penetrating stab injury(3)	0	0	0
2.Visceral injury(19)	5	5	3
Total	60(40%)	44(29.3%)	20(13.3%)

In early complications, fever was significantly noticed in 60(40%) patients and respiratory complains present in 44(29%) cases. Fever noticed in all the patient of Gut gangrene with 60% noticed in ileal perforation (15) cases whereas cough mostly noticed in ileal perforation (36%) & SAIO cases due to band and adhesions (43%)

Table 2: Late complication associated with Different emergencies

Late Complications / **Diagnosis (Total)**	**Septicemia**	**Wound Infection**	**Wound dehiscence**	**Fecal fistula**	**Incisional hernia**	**Intestinal Obstruction**	**Mortality**
A Acute Peritonitis							
1.Appendicular perforation/abscess(9)	1	2	0	0	0	0	0
2.Colonic perforation(1)	1	1	1	0	1	0	0
3.Pelvic abscess(1)	0	0	0	0	0	0	0
4.GB perforation(3)	0	1	0	0	0	0	0
5.Gut gangrene(5)	4	5	5	1	1	0	1
6.Ileal perforation(25)	6	10	2	2	0	0	3
7.Peptic perforation(36)	5	15	3	1	0	0	1
8.Ruptured liver abscess(5)	3	3	3	0	0	1	1
B. Intestinal obstruction/SAIO							
1.Band / adhesion(23)	7	12	5	2	2	0	1
2.Intussusception(4)	0	0	0	0	0	0	0
3.SAIO others(7)	0	3	0	0	0	0	0
4.Tubercular(5)	3	5	4	2	2	0	2
5.Volvulus(4)	0	3	2	1	0	0	0
C. Abdominal trauma							
1.Penetrating stab injury(3)	0	0	0	0	0	0	0
2.Visceral injury(19)	4	3	3	1	2	0	3
Total	34 (22.7%)	63 (42%)	28 (18.7%)	10 (6.7%)	8 (5.3%)	1 (0.7%)	12 (8%)

Wound infection was present in almost all the cases of Koch's abdomen, in 12(52%) cases of adhesion/band in intestinal obstruction and in 40% cases of ileal perforation. Wound dehiscence was noticed in 28 patients who were mostly in intestinal perforation, gut gangrene and Koch's abdomen group.

Fecal fistula/leak of anastomosis noticed in 10 cases which were in Koch's abdomen, band/adhesion, gut gangrene and visceral injury cases with 8 cases of incisional hernia were also noted.Out of 150 patients in 12(8%) mortality was present ; two from which belong to Koch's abdomen (out of 5 patients) & three belong to operated cases of visceral injury mostly liver injury.

Table 3: Association Co-morbid condition with Morbidity and Mortality

Post-op complications with % in total patients	**COPD (20)**	**TB (12)**	**DM (10)**	**HTN (22)**	**HIV/HbsAG (8)**
Fever(40%)	13(65%)	6(50%)	5(50%)	11(50%)	3(37.5%)
Cough/ pneumonia (29.3%)	9(45%)	9(75%)	3(30%)	11(50%)	4(50%)
Nausea / Vomiting(13.3%)	2(10%)	2(16.7%)	2(20%)	2(9.1%)	3(37.5%)
Septicemia(22.7%)	8(40%)	5(41.7%)	2(20%)	8(36.4%)	2(25%)
Wound Infection(42%)	13(65%)	9(75%)	5(50%)	9(40.9%)	3(37.5%)
Wound dehiscence(18.7%)	5(25%)	5(41.7%)	2(20%)	4(18.2%)	1(12.5%)
Fecalfistula(6.7%)	2(10%)	2(16.7%)	1(10%)	2(9.1%)	0(0%)
Incisional hernia(5.3%)	1(5%)	1(8.3%)	2(20%)	2(9.1%)	0(0%)
Intestinal Obstruction(0.7%)	1(5%)	0(0%)	0(0%)	0(0%)	0(0%)
Mortality(8%)	1(5%)	2(16.7%)	1(10%)	4(18.2%)	1(12.5%)

Mortality and morbidity were very much associated with co-morbidities of patient. 33% mortality was associated with the hypertensive patients whereas in patients of COPD & TB fever, cough, septicaemia

and wound infection were noticed high. On the basis of lab investigation of patients, morbidity and mortality was higher with low haemoglobin and raised TLC and deranged RFT.

Fever was higher in COPD 13(65%); cough was associated more with TB 9(75%), HT 11(50%) and COPD 9(45%) with significant value. Septicaemia was noticed more in TB 5(41.7%), COPD 8(40%) and HT 8(36.4%); wound infection was noticed more in TB 9(75%), and COPD 13(65%); wound dehiscence and fecal fistula was noticed more in TB patients with 5(41.7%) and 2(16.7%) values respectively and only single case was noticed of intestinal obstruction in COPD 1(5%) with significant value ($p<0.05$).

DISCUSSION

Despite many advances in perioperative care, antimicrobial therapy and intensive care support, patients with emergency exploratory laparotomies still suffer high morbidity and mortality[2].

The general surgeon performing exploratory laparotomy in emergency must be aware of the diverse etiologies of the acute abdomen, the unique characteristics of each case, and their management.

The present study comprises 150 cases of emergency exploratory laparotomies, which were admitted and underwent emergency surgery in department of surgery, SMS Medical College and Hospital, Jaipur for one year with 6 months follow up period.

This study on spectrum of emergency laparotomies was carried out to know the frequency, etiology, clinico demographic profile of various types of cases, various operative procedures executed and operative outcome.

Variety of operative procedure adopted depending on patient general condition, peritoneal contamination, site of pathology, gut viability and surgeons decision. Most commonly executed operative procedure was simple closure in 63.8% cases with less execute resection anastomosis, stoma, appendicectomy and various definitive procedure in perforation cases.

All gastroduodenal perforation were managed with simple closure with omental patch (majority),and feeding jejunostomy, Billroth 1st /2nd, pancreatico duodenectomy with FJ, simple closure with triple tube decompression. In small bowel perforation simple closure, resection anastomosis with or without proximal diversion stoma and loop ileostomy was done. In appendix appendiectomy and peritoneal lavage with drain placement was done.

In cases of intestinal obstruction adhesiolysis, removal of band, wedge resection in Meckel's diverticulum, resection anastomosis in single or double layer, double barrel stoma, proximal stoma, right hemi colectomy, Hartman's procedure, malignancy total colectomy (in TB, caecal volvulus) was done.

In abdominal trauma / penetrating injury, primary repair of gut perforation, in cases of jejunal perforation primary repair and sometime feeding jejunostomy, primary repair of mesentery tear, splenectomy, splenorrhaphy, hepatectomy, suturing on lacerated liver, packing etc was done.

In our study, we divided post-op complications into early and late. Early complications included fever , respiratory infection and nausea / vomiting patients, while late complications was septecemia, wound infection, wound dehiscence, fecal fistula and anatomosis leak, incisional hernia and intestinal obstruction.

The presence of concomitant medical illness has been previously identified as a significant predictor of the risk of postoperative morbidity and mortality by several authors[16, 17].

Dr. Vishnu Prasad N. R*et al.;* [11] found male: female ratio of 7:1, mean age of the study population was 42.4 years in whom 47% patients presented after 48 hours of onset of acute symptoms. Fever was present in 123(34%) patients and 64(18%) patients gave history of taking over-the-counter analgesics.

Dr Shyam K. Gupta*;* [10] found male to female ratio was 3.25: 1 with majority of patients were in the third to sixth decade of life.

Jhoota *et al.;* [3] found site of pathologies (n=504) in which duodenal 289(57%), gastric 42(8%), jejunal 16(3%), ileal 76(15%), appendicular 59(12%), colonic 19(4%) and esophageal 3(0.5%).He noticed that male to female ratio was 5.15:1 and patients was more in younger <50yrs. age group 422(84) in comparison to old >50 yrs. age group 82(16). And post operatively found pain 495(98%), vomiting 296(59%), abdominal distension 221(44%), constipation 193(38%), fever 24(25%) and diarrhea 35(7%).

Wani *et al.;* [4] found a male to female ratio of 3:1. Afridi *et al.;* [12] noted electrolyte imbalance, hypokalemia 60%, hyponatremia 45%, raised blood urea and creatinine 9% and found wound infection 42%, wound dehiscence 26%, respiratory complications 20%, septicemia 20% and abdominal collection 11.3%. Patients of typhoid ileal perforation and ileocaecal tuberculosis who were managed by resection

anastomosis in emergency had an anastomosis leak in 1.6%, mortality in 10.6%.

Rajesh V *et al.;* [19] noticed that 37% of the study population presented beyond 24 hours. Madhumita Mukhopadhyay [20]there were 62 major injuries among 47 patients. There were also 44 injuries to the gut including 11 duodenal injury, 11 colonic injuries and 7 mesenteric injuries.

Kocer *et al.;* [13] reported that patients who were admitted after 24 hours had a 3.4 times higher morbidity risk than patients admitted before 24 hours.

K. Mulari *et al.;* [15] found mortality was significantly high in presence of pre-existing illness cardiovascular 1(14 %) and malignancy 4(50 %).

Stagnaro Green *et al.;* [14] shown patient admitted with sever hypoglycemia with and without diabetes has been associated with increased mortality.

CONCLUSION

This study showed results that were comparable to previous studies, confirming that our population of patients was representative of India (eastern world). The most important factor clearly deciding the fate of the patient is early diagnosis, resuscitation with fluid and electrolyte balance, appropriate use of antibiotics and eliminating the source of infection. Presentation of patients immediately after the first symptom and timely surgical intervention are the keys to successful battle against cases of acute abdomen.

The incidence of acute abdomen can be tackled efficiently in limited resources, by patient's awareness, education, communication (health education), by better use of health guidelines (improving patient referral system), appropriate use of prophylactic antibiotics and timely interventions of surgeons of on triage basis.

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