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Research Paper

A Clinical Study of Acute Peritonitis

Medical Science

KEYWORDS : duodenal perforation, acute peritonitis, exploratory laparotomy.

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ABSTRACT

Back ground and objectives

In this study we have tried to find out the incidence of acute peritonitis in relation to age group and sex of the patient and evaluate the relative incidence of various causes of acute peritonitis including trauma. We have also found out the relative incidence of complications and its relation to the primary cause and analyzed the various causes of mortality and morbidity and the factors influencing it.

Methods

100 cases of acute peritonitis due to traumatic and non – traumatic causes admitted in Asram Hospital were included in this study. After detailed medical history and clinical examination the patients were taken up for treatment as per the proforma for acute peritonitis.

Results

In this series maximum number of cases was seen between the age group of 15 – 75 years with male patients accounting for 80% of cases. Mean age of patients was 36 years. Pain abdomen (100%), vomiting (56%) and fever (50%) were most common presenting symptoms in all cases of peritonitis. Tenderness and rigidity were present in all the cases.

In this series duodenal perforation was the most common cause of acute peritonitis followed by appendicular perforation (16%), ileal (8%), intestinal gangrene (8%), jejunal perforation (6%), gastric perforation (4%) and colonic perforation (2%).

All the patients were taken for surgery. Wound infection was most common complication (10%) seen in the post operative period. This was followed by fecal fistula (6%) and pelvic abscess (4%). In general complications septicemia (12%) was the most common. Mortality rate was (12%) in this study with septicemia and multi organ failure being the commonest cause of mortality.

Mean age of patients who expired was 51 years. Mortality was clearly more in patients who presented more than 24 hours duration after the onset of symptoms.

Conclusion

Duodenal perforation was the most common cause of acute peritonitis, having male predominance. Laparotomy was the treatment of choice.

MATERIALS AND METHODS

This clinical study of acute peritonitis was conducted in Asram Medical College, Eluru. Cases for present clinical study were collected from Asram Hospital wards attached to Department of Surgery, Asram Medical College, Eluru from August 2009 – 2011.

Methods

This study comprises of 100 cases of acute peritonitis coming to Asram Hospital, Eluru in a study period from August 2009 to August 2011.A pre-tested proforma was used to collect the relevant information by history, clinical examination of patients, relevant investigations required and treatment.

Patients were admitted as and when they presented with the following inclusion and exclusion criteria.

Inclusion criteria

In study, all the cases that were provisionally diagnosed with acute peritonitis and subjected to relevant investigations and underwent surgery were included.

Exclusion criteria

1. Cases who were ruled out after investigations

- Cases in paediatric age group (<15 years) as they come under superspeciality.
- Cases that were treated conservatively.
- Cases who refused surgery
- Cases unfit for surgery

Cases clinically diagnosed as peritonitis underwent x-ray erect abdomen, and blood investigations like CBC, Blood urea, serum creatinine, urine routine and microscopy. Serum amylase and widal test was done if pancreatitis or enteric fever was suspected respectively.

After stabilization, patients were taken up for surgery. Laparotomy was done under general anaesthesia or epidural anaesthesia.

Postoperatively patients were followed till discharge from hospital and

reviewed in OPD for 1 month.

Mortality in this study refers to death of the patient in the hospital during same admission as episode of peritonitis.

RESULTS

This study represents a systematic analysis of hundred operated cases of peritonitis. Period of study was from August 2009 – 2011.

Table – 1
Age Distribution

Age in years	No. of Cases	Percentage
15-25	32	32
26-35	24	24
36-45	18	18
46-55	20	20
56-65	2	2
66-75	4	4

Paediatric age group is not included in present study. Most of patients are between second and third decade of life, while majority is middle age group i.e., in third, fourth and fifth decade of life. Less patients seen in sixth and seventh decade of life.

Table -2
Sex Distribution

Sex	No. of Cases	Percentage
Male	80	80
Female	20	20

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Male patients accounted for 80% of cases while females accounted for 20% of cases. The sex ratio being 4:1.

Sex Distribution

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Table -3
Mean Age and Sex distribution

Mean age		Range
Male	37	15-74
Female	35	15-60

Mean age of patients is 36 years. Mean age in males is 37 years and mean age in females is 35 years. The youngest patient was 15 years old and eldest patient was 74 years.

Table – 4
Cause of peritonitis

Pathology	No. of Cases	Percentage
Duodenal perforation	56	56
Appendicular perforation	16	16
Ileal perforation	8	8
Gastric perforation	4	4
Jejunal perforation	6	6
Intestinal gangrene	8	8
Colonic perforation	2	2
Total	100	100

The most frequent operative finding was duodenal perforation seen in about 56% of the cases. This was followed by appendicular perforation Seen in 16% and ileal perforation seen in 8% of cases. Of the 8 cases of ileal perforation 2 were due to tuberculosis, 4 were due to enteric fever and 2 were secondary to stab injury.

Peritonitis secondary to intestinal gangrene was found in 8% of cases. 4 cases were secondary to strangulated hernia, 2 cases were secondary to volvulus and strangulation around fibrotic bands and 2 cases were secondary to volvulus around Meckels diverticulum.

6 cases showed jejunal perforation all of them were due to blunt injury abdomen. 4 cases showed gastric ulcer perforation which were prepyloric in site, none of which were found to be of malignant origin on histopathology. Colonic perforation was seen in 2 cases which were secondary to carcinoma colon.

Table – 5
Analysis of Symptoms and Signs

Symptoms & Signs	Duodenal perforation		Appendicular perforation		Ileal perforation		Others		Total	
	No	%	No	%	No	%	No	%	No	%
Pain	56	100	16	100	8	100	20	100	100	100
Vomiting	30	54	8	50	4	50	14	75	56	56
Diarrhoea	0	0	8	50	4	50	6	30	18	18
Constipation	4	7.1	0	0	0	0	4	20	8	8
Distension	18	32.7	8	50	6	66.6	4	20	36	36
Fever	28	50	12	75	4	50	6	30	50	50
Tachycardia	30	54	10	63	4	50	14	70	58	58
Hypotension	14	25	2	6.2	2	11	4	20	22	22
Tenderness	56	100	16	100	8	100	20	100	100	100
Rigidity	56	100	16	100	8	100	20	100	100	100
Obliteration of liver dullness	24	43	0	0	2	25	6	30	32	32
Absent / Diminished bowel sounds	26	46.4	8	50	8	100	12	60	54	54

Pain was found to be present in all cases of peritonitis irrespective of pathology.

Vomiting was seen with 54% of cases with duodenal ulcer perforation, 50% of cases with ileal perforation, 50% of cases with appendicular perforation. 75% of cases of peritonitis due to other causes had vomiting. In total 56% of cases had vomiting.

The next most common symptom was fever which was seen in about 50% of the total number of cases studied. Abdominal distension was seen in 36% of the cases.

Bowel disturbances were seen in 26% of cases with 8 cases of appendicular perforation and 4 cases of ileal perforation presenting with history of diarrhea.

Among the signs, tenderness including rebound tenderness, with abdominal wall rigidity was universal. 58% had tachycardia while 22% had hypotension. Hypotension was mainly seen in those cases presenting after long period of delay after the onset of symptoms.

About 54% of the cases had absent or diminished bowel sounds. In 32% of the cases the liver dullness was obliterated in the anterior axillary line.

Table – 6
Duration of Illness

Duration in hours	No. of Cases	Percentage
≥ 24	60	60
≤ 24	40	40

60% of patients had duration of illness more than 24 hours by the time they were taken for surgery. It was mainly because of late presentation to the hospital.

Table – 7
Laboratory investigations

Laboratory investigations	Duodenal perforation		Appendicular perforation		Ileal perforation		Others		Total	
	No	%	No	%	No	%	No	%	No	%
Anemia	14	25	4	25	2	22	10	50	30	30
Leucocytosis	8	14.3	8	50	2	11.1	6	30	24	24
Leucopenia	10	18	0	0	2	22.2	4	20	16	16

30% of patients had anemia which included 14 patients of duodenal perforation, 2 patients of ileal perforation and 4 patients of appendicular perforation. 50% of appendicular perforation had leucocytosis.

Table – 8
Radiological Investigation

Laboratory investigation	Duodenal perforation		Appendicular perforation		Ileal perforation	
	No	%	No	%	No	%
Air under the diaphragm	47	83.9	2	12	2	22
Dilated loops, Multiple air fluid levels	2	3.5	2	12	6	75

Around 83.9% of patients of duodenal perforation showed gas under right dome of diaphragm.

Only two patients of ileal perforation showed gas under diaph-

gram while most of patients of ileal perforation had dilated bowel loops with multiple air fluid levels.

12 patients of appendicular perfora tion i.e. 75% had normal x-ray findings while nine patients i.e.16% of duodenal perforation had normal x-ray. One case of colonic perforation showed multiple air fluid levels. All cases of gastric perforation had gas under diaphragm.

Most of the cases show findings of peritonitis on x-ray i.e. obliteration of psoas shadow and preperitoneal fat lines and generalized haze.

Table – 9
Peritoneal aspirate

Laboratory investigations	Duodenal perforation		Appendicular perforation		Ileal perforation		Others		Total	
	No	%	No	%	No	%	No	%	No	%
Seropurulent	16	28	2	12.5	6	75	4	20	28	28
Purulent	16	29	12	75	0	0	8	40	36	36
Bilious	24	43	0	0	0	0	2	10	26	26
Hemorrhagic	0	0	0	0	0	0	0	0	0	0
Feculent	0	0	2	12.5	2	25	6	30	10	10
Total	56	100	16	100	8	100	20	100	100	100

Four quadrant aspirations were done in all cases. Peritoneal tap was positive in all cases of peritonitis.
Peritoneal aspirate was found to be purulent in 36% of cases. In 16 patients of duodenal perforation and 12 patients of appendicular perforation tap was purulent. 43% of duodenal perforation patients had bilious aspirate, while purulent aspirate was predominant in appendicular perforation. Ileal perforation patients mainly had seropurulent and feculent aspirate.

Table – 10
Results of culture of peritoneal fluid

Laboratory investigations	Duodenal perforation		Appendicular perforation		Ileal perforation		Others		Total	
	No	%	No	%	No	%	No	%	No	%
Sterile	18	33	0	0	2	25	6	30	26	26
E.coli	16	28.9	10	62.5	4	50	4	20	34	34
Mixed	4	8.1	4	25	0	0	2	10	10	10
B. fragilis	6	10	2	12.5	2	25	4	20	14	14
Staphylococcus	6	10	0	0	0	0	2	10	8	8
Pseudomonas	6	10	0	0	0	0	0	0	6	6
Klebsiella	0	0	0	0	0	0	2	10	2	2
Total	56	100	16	100	8	100	20	100	100	100

E.coli was predominant organism in the aspirate culture i.e. 34% of cases. It was most common – organism cultured in all duodenal, ileal and appendicular perforation.

In 26% cases aspirate was sterile and 14% of cases had bacteroides fragilis present in the peritoneal tap.

Table – 11
Operative Procedure adopted

Operative procedure	No. of Cases	Percentage
Closure with omental graft (Graham'spatch)	56	56
Simple closure of perforation	16	16
Peritoneal toilet only	2	2
Resection and anastomosis	8	8
Transverse colostomy	2	2
Appendicectomy	16	16
Total	100	100

Duodenal ulcer perforations were closed using omental patch (Grahm's patch). .All appendicular perforation cases underwent appendicectomy. All cases of gastric perforation were closed with simple closure only. Jejunal and ileal perforations were closed with simple closure only.
one case of sealed ileal perforation was treated with peritoneal toilet. Two cases of colonic perforation underwent resection of gangrenous part and transverse colostomy figure -17. All cases underwent peritoneal lavage and drainage after surgery.

Table – 12
Postoperative complications – Local

Laboratory investigations	Duodenal perforation		Appendicular perforation		Ileal perforation		Others		Total	
	No	%	No	%	No	%	No	%	No	%
Wound infection	8	14.4	2	12.5	0	0	0	0	10	10
Fecal fistula	0	0	0	0	4	50	2	10	6	6
Pelvic abscess	4	7	0	0	0	0	0	0	4	4
Duodenal fistula	2	3.6	0	0	0	0	0	0	2	2
Burst abdomen	0	0	0	0	0	0	2	10	2	2
Paralytic ileus	0	0	0	0	0	0	2	10	2	2
Total	14	25	2	12.5	4	50	6	30	26	26

Wound infection was commonest complication seen in 10% of cases, eight cases of duodenal perforation and two cases of appendicular perforation developed wound infection. It was treated by antibiotics and regular dressings. Fecal fistula was seen in 6 cases, 4 cases were seen in ileal perforation and all 4 patients expired. Four cases of duodenal perforation developed pelvic abscess. Prolonged paralytic ileus was present in 2 cases. It was treated by nasogastric aspiration and maintaining electrolytes. Two cases of intestinal gangrene developed burst abdomen. One patient developed duodenal fistula and was treated with re-laparotomy and closure.

Table -13
Postoperative complications – General

Complications	No. of Cases	Percentage
Respiratory	4	4
Septicemia	12	12
Renal	4	4
Cardiac	2	2
Total	22	22

12% of patients had persistent septicemia in post operative period. They were managed with antibiotics, IV fluids and blood transfusions.

Four cases developed acute renal failure and needed dialysis. Two cases had cardiac complications in the form of ischemic changes

Four patients had respiratory complications. All were smokers and developed pneumonia and diagnosed clinically and on chest – x-ray.

Table -14
Mortality in relation to cause

Cause	Mortality	Percentage
Gastric perforation	0	0
Duodenal perforation	4	7.2
Jejunal perforation	0	0
Ileal perforation	4	50
Appendicular perforation	0	0
Colonic perforation	2	100
Intestinal gangrene	2	25

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Total of 12 patients expired. 8 patients died of septicemia and multiple organ failure. Mortality in duodenal perforation cases is 7.2% and in ileal perforation cases its 50%. Only 2 cases of colonic perforation present so mortality cannot be considered. 4 patients of duodenal perforation died of septicemia and multiple organ failure. Two case of colonic perforation died of myocardial infarction.

Table -15
Mortality in relation to duration of illness

Duration in hours	No. of Cases	Death	CFR%
≥ 24	60	10	16
≤ 24	40	2	5

case of colonic perforation died of myocardial infarction.

The group of patients in whom onset of symptoms was present more than twenty four hours before surgery, had higher number of deaths. Even case fatality rate was higher in this group which was 16%. It was more than double of the group in whom surgical intervention was done early.

Table -16
Mortality in relation to age of patients

No. of cases	Mean age	Range
Expired	51years	28-65
Survivors	35 years	15-74

Mean age of survivors is 35 years while mean age of patients who expired is higher i.e. 51 years.

CONCLUSION

From my study of 100 cases of peritonitis following conclusions can be drawn-

Most of the cases of peritonitis are middle aged male patients with mean age of 37 years and male to female ratio of 4:1. Abdominal pain is the most common symptom followed by vomiting and fever. Guarding, rigidity, tachycardia and absent bowel sounds are most common signs seen in peritonitis.

Duodenal ulcer perforation is the commonest cause of peritonitis followed by appendicular perforation.

Most of duodenal perforations can be detected by erect abdominal x-ray. Peritoneal tap was positive in all cases of peritonitis.

E coli were the most common organism found on peritoneal aspirate culture. Around one fourth of cases had sterile culture.

Wound infection is a most common postoperative complication.

Mortality is proportional to age, derangement of physiological parameters like hypotension, delay in surgery and as perforation site becomes distal from duodenum to colon.

SUMMARY

This study analyses 100 cases of peritonitis coming to Asram Hospital attached to Department of Surgery Asram Medical College, Eluru.

In this series highest number of patients was present between age group of twenty to fifty years. Mean age of male patients is 37 years and in female patients it is 35 years. Male patients outnumbered females by ratio of 4:1.

Pain abdomen, tenderness and rigidity were universal in present study series.

Obliteration of liver dullness was present in 43% of duodenal perforation and in total 32% percent of patients had obliteration of liver dullness.

Around 30% patients of peritonitis were anaemic. 24% had leucocytosis and 16% had leucopenia.

Most of patients had duration of symptoms for more than twenty four hours by the time, they were taken for surgery. This was mainly because of late presentation to the hospital.

Diagnostic peritoneal tap was positive in all cases of peritonitis and E. coli was the most common organism cultured in 34% of cases. In 26% of cases culture yielded no growth.

Erect abdominal x-ray was taken to detect gas under diaphragm and find out other features of peritonitis. 84% of duodenal perforation patients and all four patients of gastric perforation had gas under right dome of diaphragm.

All the patients were treated surgically. Duodenal perforation was the commonest cause of peritonitis (56%) followed by appendicular perforation (16%), ileal perforation (8%), intestinal gangrene (8%), jejunal perforation (6%), gastric perforation (4%) and colonic perforation (2%).

Duodenal perforation patients underwent closure with omental graft. 8 cases of intestinal gangrene underwent resection and anastomosis. 16 patients underwent appendicectomy. Simple closure of perforation was done in 16 cases.

Peritoneal lavage was given and drain was kept in all cases.

Wound infection was most common local complication seen in 10% of cases.

Mortality rate was 12% in this study with septicemia and multiple organ failure being the commonest cause of mortality.

Mean age of patients who expired was 51 years while those of survivors were 35 years.

Mortality was clearly more in patient in whom surgery was delayed for more than 24 hours.

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