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A CLINICOETIOLOGICAL STUDY AND DIAGNOSTIC EVALUATION OF PERITONITIS PRESENTING AS ACUTE ABDOMEN

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ABSTRACT

Peritonitis is a common emergency encountered by surgeons the world over. This paper aims to provide an overview of the spectrum of peritonitis encountered in asram medical college, eluru over a period of august 2014 to 2016. Studies dealing with the overall spectrum of secondary peritonitis were analyzed for the site and cause of perforation.

AIM:

1. To analyse various causes of acute peritonitis and including trauma.

2. To analyse the incidence of complications and its relation to cause.

MATERIAL AND METHODS:

100 cases of acute peritonitis due to trauma and non-traumatic causes admitted in ASRAM Hospital were included in the study.

RESULTS: *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%).*

Wound infection was most common complication (10%) seen in the post operative period. This was followed by feacal fistula (6%) and pelvic abscess (4%). In general complications septicemia (12%) was the most common.

CONCLUSION: *It was observed that perforation of duodenal ulcers was the most commonly encountered perforations. These are followed by appendicular and small bowel perforations. Colonic perforations were uncommon. Wound infection encountered in 10% cases was the most common complication encountered in post operative period.*

KEYWORDS :

INTRODUCTION:

Secondary peritonitis due to perforation of the gastrointestinal tract is one of the most common surgical emergencies all over the world and is associated with significantly morbidity and mortality. This study was conducted to evaluate the etiologies, treatment outcome and their prognostic factors altogether.

AIMS AND OBJECTIVES:

This clinical study of acute peritonitis was conducted in Asram Medical College, Eluru comprising of 100 cases of acute peritonitis. Cases collected from Asram Hospital wards attached to Department of Surgery, over a period of 2years extending from august 2014 to 2016. Our aim of study is:

1. Evaluation of relative incidence of the various causes of acute peritonitis including trauma.
2. Finding out the relative incidence of complications and its relation to the primary causes.

MATERIALS AND METHODS:

This is a descriptive cross-sectional study, comprising of 100 cases of acute peritonitis admitted during a period of 2 years in Asram Hospital, Eluru in a study period from August 2014 to August 2016.

A pre-tested proforma was used to collect the relevant information by history, clinical examination of patients, relevant investigations required and treatment given.

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

Inclusion criteria:

In this 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
2. Cases in paediatric age group (<15 years) as they come under super speciality.
3. Cases that were treated conservatively
4. Cases who refused surgery
5. 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.

Causes Of Peritonitis:

Table No 1:

Causes Of Peritonitis	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%

Symptoms and Signs
Table No 2:

	Duodenal perforation		Appendicular perforation		Ileal perforation		Others		Total	
	No of cases	%	No of cases	%	No of cases	%	No of cases	%	No of cases	%
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

Operative Procedure adopted:
Table No.3:

Operative procedure	No. of Cases	Percentage
Closure with omental graft (Graham patch)	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

Postoperative complications – Local (Table No.4)

Laboratory investigations	Duodenal perforation		Appendicular perforation		Ileal perforation		Others		Total	
	No of cases	%	No of cases	%	No of cases	%	No of cases	%	No of cases	%
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 perforation fistula	2	3.6	0	0	0	0	0	0	2	2
Burst abdomen 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

Postoperative complications – General
Table No.5:

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

RESULTS:

Analysis of Causes Of Peritonitis:

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 pre-pyloric 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.

Analysis of Symptoms and Signs:

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.

Analysis of Operative Procedure adopted:

Duodenal ulcer perforations were closed using omental patch (Graham'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. All cases underwent peritoneal lavage and drainage after surgery.

Analysis of Postoperative complications- Local

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.

Analysis of Postoperative complications – General

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 on chest x-ray.

DISCUSSION

Peritonitis has a long historical background and is conventionally divided into 3 groups. Primary peritonitis is an infection of the peritoneal cavity usually occurring in patients with preexisting ascites that is not related to diseases of the abdominal or retroperitoneal viscera.[1] Secondary peritonitis, the most common form of peritonitis, can occur due to spontaneous perforation of the gastrointestinal tract, intestinal ischemia, or following an operation.[2,3] Tertiary peritonitis is a recurrent infection of the peritoneal cavity that follows an episode of either primary or secondary peritonitis. Tertiary peritonitis develops following treatment of secondary peritonitis either due to failure of the host inflammatory response or due to superinfection.[3,4] The contamination of peritoneal cavity thus, can lead to a cascade of infection, sepsis and multisystem organ failure (MSOF) and death if not treated in a timely manner.[4,5]

Causes of Peritonitis

In the present series, 56% of cases of peritonitis were due to duodenal perforation, 16% were due to appendicular perforation, 8% were due to ileal perforation, 8% were due to intestinal gangrene, 6% were due to jejunal perforation , 4% were due to gastric perforation and 2% were due to colonic perforation. These findings were similar to the result of various other studies [6,7,8]

In a study by LA Desa, 32.29% cases were of duodenal ulcer perforation, 27.33% were ileal perforation and 18% were appendicular perforation.[10]

Kachroo reported 16.7% incidence of duodenal perforation, 41% incidence of appendicular perforation and 13.3% of ileal perforation.[11]

Symptoms and Signs

In this study pain abdomen was seen in all patients. Same was seen in study by Kachroo where it was seen in 89 patients out of 90 patients. LA Desa reported pain in only 86.96% of patients.[10,11]

Vomiting was seen in 56% of cases in this study which relates well with 53.42% seen in LA Desa series.[10]

Bowel disturbance was seen in 26% of patients in this series while it was 30.43% in LA Desa series. Distension of abdomen was seen in 36% cases while in LA desa series it was seen in 52.7% cases. Fever was present in 50% of our cases while in LA Desa series it was present in 44.1% cases. 58% of our patients had tachycardia at presentation, while 22% patients were in state of shock, In LA Desa study, 39.75% of cases came in shock.[10]

Abdominal tenderness and rigidity was present in all patients in this series and it correlates well with Kachroo series where it was same. But in study by LA Desa it was present in 85.71% of cases only.

Liver dullness was obliterated in 32% of the cases in this series, where as in LA Desa series it was obliterated in 50.93% of cases. Bowel sounds were absent or diminished in 54% cases in our study and it relates well with LA Desa series in which paralytic ileus was present in 51.5% cases. In study by Kachroo bowel sounds were absent in 44% cases.[10,11]

Investigations:

a. X-ray erect abdomen:

1. Rigler's sign: Air on both sides of the intestinal wall
2. Air in the right upper quadrant, around the liver.[4]

Late signs include:

1. Falciform ligament sign: Air outlining the falciform ligament.
2. Football sign: Air outlining the peritoneal cavity
3. Inverted V sign: Air outlining the umbilical ligaments and are seen in massive pneumoperitoneum. The supine radiograph has an overall sensitivity of 59% for free air.[12]

b. Plain x-ray Chest :

Free gas under the diaphragm is detected more readily in the chest x-ray than in the erect abdominal x-ray, provided the same preconditions are met.[2,4]

c. Contrast Studies :

X-ray abdomen after injection of 60ml of fifty percent gastrograffin into the stomach through a nasogastric tube may demonstrate the site of perforation especially in high gut perforations.

Barium is not used as it has an adjuvant effect, aggravating peritonitis.[2,3]

2.Diagnostic paracentesis :

In adults this is the most useful initial study. A positive diagnostic tap is useful; where as negative tap is not significant. Bile stained fluid indicates high gut perforation. The aspiration of clear fluid indicates an early stage, where as cloudy purulent aspirate points to well established bacterial peritonitis. Intraperitoneal hemorrhage results in bloody aspirate. The aspirate is then sent for microscopy and culture and sensitivity so as to aid in initiation of appropriate antibiotic.[15]

3. Computed Tomography :

CT scanning has been found to be significantly more sensitive than plain films for detecting small amounts of free air.

In addition it is a sensitive study for a wide variety of diagnosis including appendicitis, diverticulitis, intestinal ischemia, pancreatitis, intestinal obstruction and perforated viscus which could have precipitated the peritonitis. It is also very sensitive for intraabdominal abscess.[13]

4. Ultrasonography :

In peritonitis, ultrasonography can identify intraperitoneal fluid and ileus whether localized or diffuse. The advantages of this modality are that it has a greater sensitivity for intraabdominal abscess, it can be a bedside procedure and does not deliver ionizing radiation.[2,4,12]

In general, the role of more elaborate diagnostic studies such as computed tomography is limited to those patients presenting with abdominal pain who have no immediate compelling indication for abdominal exploration and

1) May have an extra abdominal or non surgical cause of peritonitis such as pyelonephritis .

2) May have unreliable physical evaluation as when analgesics or steroids have been administered or in the presence of altered consciousness due to head injury or metabolic encephalopathy or spinal injury.[13,14]

5. Peritoneal biopsy :

Peritoneal biopsy is used to make a diagnosis of granulomatous peritonitis. It is not a routinely done investigation.[13]

Operative procedure

56 patients of duodenal perforation cases underwent surgery in form of closure with omental patch (Grahams patch).[16] In one case of sealed ileal perforation, only peritoneal toilet was done.[17,18] In cases of appendicular perforations, appendicectomy was done. Simple closure of perforation was done in 16 cases, 6 cases were of ileal perforation, 6 were of jejunal perforation, and 4 were of gastric perforation. Resection and anastomosis was done in total 8 cases. All eight patients were of intestinal gangrene.

Post operative complications:

Patients were observed till discharge from Hospital. Wound infection was commonest complication found in 10% of cases. Six patients developed fecal fistula. Four patients were of ileal perforation, Two cases were of volvulus of intestine around fibrotic band.

Pelvic abscess, duodenal fistula, burst abdomen and prolonged paralytic ileus was present in 4%, 2%, 2% and 2% of patients respectively which are similar to results of other studies.[19,20]

In a study by LA Desa, wound infection, was commonest complication.[10]

R.Kachroo reported wound infection, paralytic ileus, and fecal fistula and burst abdomen in 20%, 12%, 2% and 1.1% of patients respectively.[11]

CONCLUSION:

Despite a better understanding of pathophysiology, advances in diagnosis, surgery, antimicrobial therapy and intensive care support, peritonitis remains a potentially fatal affliction. Secondary peritonitis due to perforation of the gastrointestinal tract is one of the most common cause with perforation of duodenal ulcers as the commonly encountered perforations, followed by small bowel and appendicular perforations. There is no controversy regarding the standard treatment that includes control of the source, definitive operative procedure and intra-abdominal lavage.

REFERENCES:

1. Jeremy Thompson. The peritoneum, omentum, mesentery and retroperitoneal space. Russell RCG,. Williams NS, Burtrode CJK. In: Bailey and Love's short practice of surgery.. New York: Arnold; 2004.p.1133-1152.
2. Wittmann DH, Schein M, Condon RE. Management of secondary peritonitis. Ann Surg. 1996; 224(1): 10-18.
3. M. A. Malangoni and T. Inui, "Peritonitis—the Western experience," World Journal of Emergency Surgery, vol. 1, no. 1, article 25, 2006.
4. Johnson CC, Baldessarre J, Levison ME. Peritonitis: update on pathophysiology, clinical manifestations, and management. Clin Infect Dis. 1997; 24(6): 1035-1045.
5. N. Agarwal, S. Saha, A. Srivastava, S. Chumber, A. Dhar, and S. Garg, "Peritonitis: 10 years' experience in a single surgical unit," Tropical Gastroenterology, vol. 28, no. 3, pp. 117–120, 2007.
6. S. Gupta, R. Kaushik, R. Sharma, and A. Attri, "The management of large perforations of duodenal ulcers," BMC Surgery, vol. 5, article 15, 2005.
7. Mandava, S. Kumar, W. F. Pizzi, and I. J. Aprile, "Perforated colorectal carcinomas," The American Journal of Surgery, vol. 172, no. 3, pp. 236–238, 1996.
8. K. Khanna and M. K. Misra, "Typhoid perforation of the gut," Postgraduate Medical Journal, vol. 60, no. 706, pp. 523–525, 1984.
9. B. di Venere, M. Testini, S. Miniello et al., "Rectal perforations. Personal experience and literature review," Minerva Chirurgica, vol. 57, no. 3, pp. 357–362, 2002.
10. Desa LA, Mehta SJ, Nadkarni KM, Bhalerao RA. Peritonitis : A study of factors contributing to mortality. Indian J Surg 1983; 45: 593-604.
11. Kachroo R, Ahmad MN, Zargar HV. Peritonitis — An analysis of 90 cases. Indian JSurg 1984;46:203-209.
12. A. Uccheddu, G. Floris, M. L. Altana, A. Pisanu, A. Cois, and S. L. F. Farci, "Surgery for perforated peptic ulcer in the elderly. Evaluation of factors influencing prognosis," Hepato-Gastroenterology, vol. 50, no. 54, pp. 1956–1958, 2003.
13. M. A. Malangoni and T. Inui, "Peritonitis—the Western experience," World Journal of Emergency Surgery, vol. 1, no. 1, article 25, 2006.
14. J. Bohnen, M. Boulanger, J. L. Meakins, and P. H. McLean, "Prognosis in generalized peritonitis. Relation to cause and risk factors," Archives of Surgery, vol. 118, no. 3, pp. 285–290, 1983.
15. Yinnon AM, Gabay D, Raveh D, Schlesinger Y, Slotki I, Attias D, Rudensky B. Comparison of peritoneal fluid culture results from adults and children undergoing CAPD. Perit Dial Int. 1999; 19(1): 51-55.
16. A. C. Dean, C. G. Clark, and A. H. Sinclair-Gieben, "The late prognosis of perforated duodenal ulcer," Gut, vol. 3, pp. 60–64, 1962.
17. A. C. Dean, C. G. Clark, and A. H. Sinclair-Gieben, "The late prognosis of perforated duodenal ulcer," Gut, vol. 3, pp. 60–64, 1962
18. G. P. Noon, A. C. Beall, and G. L. Jorden, "Clinical evaluation of peritoneal irrigation with antibiotic solution," Surgery, vol. 67, pp. 73–78, 1967.
19. M. Oheneh-Yeboah, "Postoperative complications after surgery for typhoid ileal perforation in adults in Kumasi," West African Journal of Medicine, vol. 26, no. 1, pp. 32–36, 2007.
20. Sartelli M. A focus on intra-abdominal infections. World J Emerg Surg. 2010; 5: 9.