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Clinical Study of Non-Traumatic Causes and Management of Generalized Peritonitis in Adults

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ABSTRACT

Background: Non-traumatic perforation peritonitis is a common surgical emergency. Diagnosing its exact cause is difficult as various modes of presentation often mislead the diagnosis. Before venturing into abdomen, surgical planning is important. Sound knowledge of current surgical techniques is important for better case management. This study aims to find out various modes of presentation, diagnosis and management of non-traumatic perforation peritonitis.

Materials and Methods: This is a prospective study conducted in KIMS Multispecialty hospital from April-2018 to March-2019 including 50 patients presenting with perforation peritonitis of any non-traumatic cause.

Results: Majority presented with pain abdomen (100%) followed by constipation (94%), abdominal distension (80%) and vomiting (74%). Guarding and rigidity was present in all cases and obliteration of liver dullness in 92% cases. Erect abdomen X-ray showed air under diaphragm in 92% cases. Diagnostic peritoneal tap was positive in 90% cases.

Common causes are duodenal ulcer perforation (40%), ileal perforation (34%) and appendicular perforation (18%). Common surgeries employed are suture closure and omental reinforcement for gastric and duodenal perforations (76%), appendectomy for appendicular perforations (18%). Four deaths were reported. Wound infection and systemic complications were most common (14% each), followed by wound dehiscence (8%).

Conclusion: Common presenting complaints are pain abdomen, constipation, abdominal distension and vomiting. Useful investigations are erect abdomen X-ray, peritoneal tapping and abdominal ultrasonography.

Most frequent surgery employed is primary closure of perforation. Resection and anastomosis is done for intestinal perforations. Peptic ulcer perforation is the most common cause that does not need any definitive surgical intervention.

Keywords: Diagnosis, Management, Non-traumatic, Perforation, Peritonitis.

INTRODUCTION

Acute peritonitis is a frequently encountered surgical emergency that causes significant morbidity and mortality. [1,2] Though Peritonitis is a well known entity from the days of Hippocrates, Rowlison was the first to give a clear description of its signs and symptoms. [3] Later on, several studies were conducted to report the etiology, clinical features and management of perforative peritonitis. [4-6] Gastrointestinal perforation is the most common among the varied etiologies of perforation peritonitis. [7] Presenting complaints of a case of perforation peritonitis vary from mild dull aching pain, to frank guarding and rigidity with associated systemic symptoms. However, these features are less dramatic in case of posterior perforation. [8]

The investigations employed must provide a definite diagnosis in a short duration of time. After diagnosis, the method of management employed is of prime importance. Peritoneal lavage, peritoniostomy and ostomy of viscera, resection and anastomosis are

various methods employed in literature. [9-11] Modern surgical techniques, antimicrobial therapy and intensive care facilities potentially improved the surgical outcome. [12] Modification in the activity of the mesothelial cells by molecular strategies is a recent advance in treatment modalities. [13]

An early surgical intervention is always recommended than a late surgery. A delay in obtaining a surgical opinion often worsens the patient's condition. To prevent such delay, enlisting the various etiologies of perforation peritonitis and the most common among them is very important. Etiological spectrum of perforation peritonitis in India differs from its western counter parts. [14-16] Thus, good knowledge of the diverse etiology is important while managing a case of obscure perforation peritonitis.

This study aims to find out various etiologies of generalized peritonitis other than trauma and also to know its various modes of presentation, diagnosis and management.

METHODS

This is a prospective study done in the clinical settings of General Surgery department, KIMS Multispecialty hospital, Amalapuram for a period of one year i.e., from April 2018 to March 2019. Study population was made of 50 patients who presented with the clinical diagnosis of non-traumatic perforation peritonitis during the study period and underwent surgery in our hospital.

Detailed clinical history is obtained with an emphasis on presenting signs and symptoms. All the findings of clinical examination and vital signs were recorded. All the patients were examined for the presence of guarding or rigidity, rebound tenderness, liver dullness and decreased bowel sounds. An erect abdomen X-ray was done for all the cases to particularly look for presence of any gas under diaphragm. Abdominal ultrasonography was done for all the cases to rule out any other pathology.

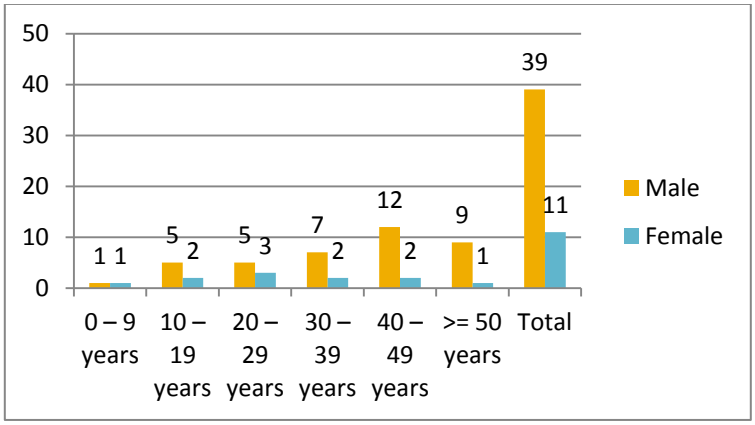
Laparotomy with an incision was employed in all the cases depending upon the probable site of perforation. The perforations were managed according to the protocol followed in our hospital. The peritoneal fluid was sent for culture and sensitivity to identity the organism and its sensitivity to antibiotics. Operative procedures employed were noted. After the surgery, a regular follow up was provided to check for any postoperative complications, and also to record morbidity and mortality rates. Patients were discharged after attaining complete stability.

All the data was collected by purposive sampling irrespective of their sex and was entered into Microsoft Excel and further statistical analysis was done using SPSS software version 16.0. The usefulness of clinical features and investigation for the diagnosis was assessed by using a chi-square test and student 't' test.

RESULTS

Mean age of the study population 35.08 years. A majority of 28% (14 cases) were aged between 40-49 years, and a minority of 4% (2 cases) were aged between 0-9 years. Study population is made of 39 males and 11 females with a male-female ratio of 3.5:1. (Figure-1).

Figure-1: Age and Sex distribution



Agriculturists are more commonly affected. There are 17 males and 3 females in duodenal perforation group, 4 males in gastric perforation group, 12 males and 5 females in ileal perforation group, 6 males and 3 females in appendicular perforation group. The association between etiology and gender was not significant.

Peritonitis due to duodenal perforation had a peak incidence in 40-49 years age group, ileal perforation in 30-39 years age group, appendicular perforation in 10-19 years age group, gastric perforation in 40-49 years age group. The association between etiology and age was highly significant. (Table-1)

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Table-1: Distribution of cases according to age and etiology

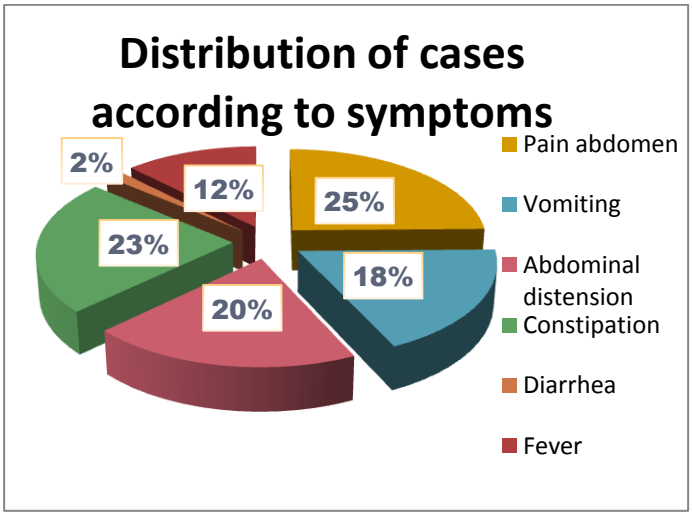
Age (years)	Duodenal perforation	Ileal perforation	Appendicular Perforation	Gastric perforation	Total
	No.	No.	No.	No	No.
0 – 9	-	-	2	-	2
10 – 19	1	2	**4**	-	7
20 – 29	3	4	1	-	8
30 – 39	3	**5**	1	-	9
40 – 49	**7**	2	1	**4**	14
>=50	6	4	-	-	10
Total	20	17	9	4	50

χ^2=34.50

p<0.001 Highly significant

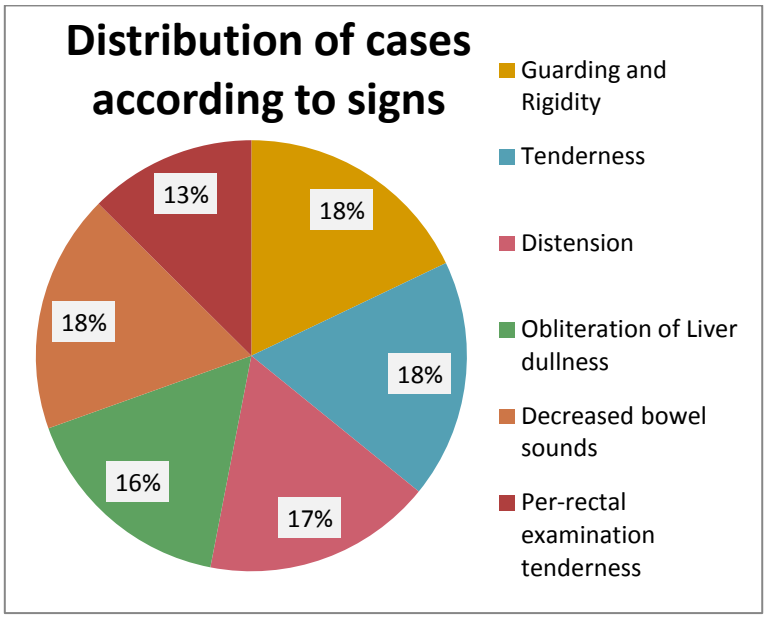
All the cases presented with pain abdomen, followed by constipation (94%), abdominal distension (80%) and vomiting (74%). (Figure-2)

Figure-2: Distribution of cases according to symptoms



All the cases presented with Guarding and rigidity, decreased bowel sounds and tenderness at relevant quadrants of abdomen. 48 cases presented with abdominal distension, 46 with obliteration of liver dullness and 35 with per-rectal examination tenderness. (Figure-3).

Figure-3: Distribution of cases according to signs



Erect X-ray of abdomen revealed gas under diaphragm in 46 cases. Peritoneal tap was positive in 45 cases (bilious in 23 cases, purulent in 16 cases and feculent in 6 cases.). Widal test was positive in 14 cases.

Relation between type of surgery (management) done and outcome

Simple closure with omental patch operation was performed in 38 cases, resection with end to end anastomosis in 2 cases, resection with ileo-transverse anastomosis in 1 case and appendectomy in 1 case. Of them, 4 were expired (10.52% mortality).

Relation between cause and type of surgery

Simple closure with omental patch operation was performed in majority of the study participants i.e., in all patients with duodenal perforation (20 patients), 14 patients with ileal perforation and 4 patients with gastric perforation. Other cases with ileal perforation underwent resection with end to end anastomosis (2 cases) or resection with ileo-transverse anastomosis (1 case). All cases with appendicular perforation underwent appendectomy.

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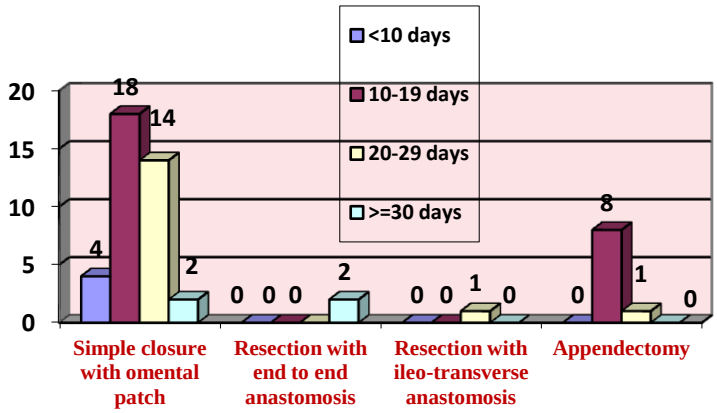
Distribution according to complications

Wound infection (7 cases) and systemic complications (7 cases) were most common complications, followed by wound dehiscence (4 cases), burst abdomen (3 cases) and fistula (2 cases).

Various local complications like wound infection, wound dehiscence, burst abdomen and fistula were noted in few cases. Systemic complications were observed in 7 patients who underwent simple closure with omental patch

Most of the patients i.e., 26 (52%) had to stay in hospital for 10 to 19 days. Among these 26 cases, simple closure with omental patch operation was performed in 18 cases and appendectomy was performed in 8 cases. (Figure-4)

Figure-4: Relation between type of surgery and hospital stay



DISCUSSION

The mean ageof the study population of this study is 35.08 years which is comparatively lower than mean age of populations of other similar studies. [17, 18]. Life style changes like smoking and alcohol consumption may be contributory.

In this study, higher incidence was seen in males with Male to Female ratio as 3.5:1. Peptic ulcer perforation is the leading cause for peritonitis and seen in 24 cases (20 cases of duodenal ulcer perforation and 4 cases of gastric ulcer perforation).Consumption of high spicy food, smoking and alcohol in this region may be contributing factors. Ileal perforation was the second leading cause for peritonitis and seen in 17 cases. Poor living conditions, illiteracy and poor sanitation prevailing in this area may be contributory.

Presenting features:

All the cases presented with abdominal pain, Guarding and rigidity, decreased bowel sounds and rebound tenderness. The severity of abdominal pain varied. Many patients presented with typical symptoms of DUP in our study, diagnosis was usually delayed in psychiatric patients. Rebound tenderness was very significant in the diagnosis and considered as cardinal sign of peritonitis. Decreased bowel sounds were considered as a sign of paralytic ileus.

Obliteration of liver dullness was seen in 92% of the cases and was a main finding in the diagnosis of pneumoperitoneum. Tenderness was the only positive finding noted in per rectal examination and was present in 70% of the patients.

Investigations:

- X-ray Erect Abdomen revealed gas under diaphragm in 92% of the patients (Figure-5A). It was absent in 4 cases of appendicular perforation.
- Diagnostic peritoneal tap was positive in 45 cases and gave fluid of probable site of perforation. Maximum yield was bilious (Figure-5B) and seen in duodenal perforation. It was purulent in appendicular perforation, and feculent in ileal perforation. This is an important investigation in diagnosing generalized peritonitis and its most probable cause.
- Abdominal ultrasonography was principally useful in diagnosing free fluid in the peritoneum. It can be used to exclude other pathologies.
- Widal test was positive in all the patients of ileal perforation.
- Culture of peritoneal fluid revealed Escherichia coli as most common organism.

Figure 5: A. Plain X-ray Erect abdomen and chest showing gas under both domes of the diaphragm B. Diagnostic peritoneal tap showing bilious fluid

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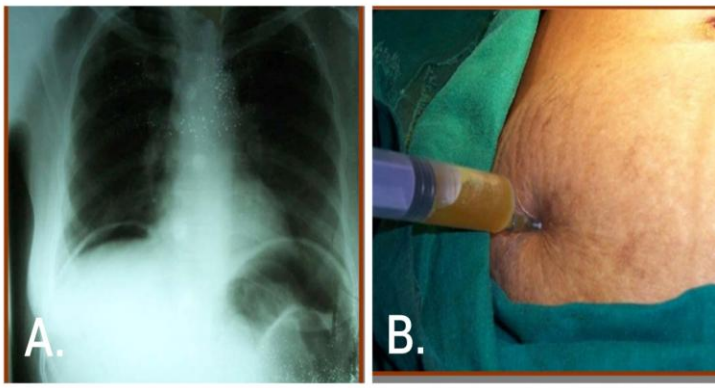


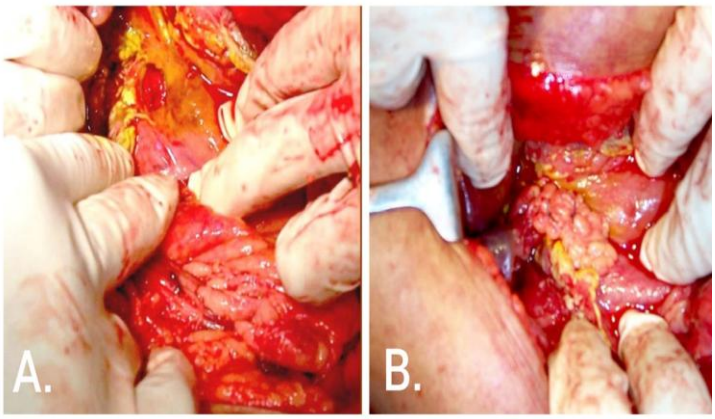
Site of perforation:

In our study, peptic ulcer perforation was the most common cause of peritonitis (24 cases). This finding signifies the consumption of spicy diet and alcohol. Ileal and appendicular perforation contributed the next major share.

Treatment:

Duodenal ulcer perforation:All patients underwent primary closure with omental patch and peritoneal lavage. None of them needed any definitive surgical procedures. Patients were started on proton-pump inhibitors for 6 weeks after surgery. This protocol is followed with the background knowledge that proton pump inhibitory are very powerful in decreasing secretion of acid and that studies have shown acceptable results with non-operative management presenting late (>24 hours) with peptic perforation. Gastric perforationwas also managed similarly and closed with suture and omental reposition (Figure-6A and 6B).

Figure-6: A. Gastric perforation, B. Primary Closure with Omental Patch of Gastric Perforation



Ileal perforation:Many authors recommended a specific procedure depending on the number, condition of the bowel, associated risk factors and patient's general condition. Few studies reported simple closure of the perforation as an effective method.

In this study 14 cases of ileal perforation were closed with primary sutures and omental patch, 2 underwent resection with end to end anastomosis and 1 case underwent resection with ileo-transverse anastomosis.

Appendicular perforation: Appendectomy is the standard treatment and was performed in all cases. Almost all cases presented with grade-2 peritonitis and so, above peritoneal lavage was given to all of them.

Postoperative follow-up*:* We started oral feed on second or third postoperative day that resulted in early modification and early recovery. Wound infection and systemic complications were found in 14% of the cases, wound dehiscence in 8%, burst abdomen in 6%, and fistula in 4% of the cases

Mortality*:* Four deaths were reported in this study. Mortality is high in patients who were taken late for the surgery. All patients with duodenal ulcer perforation died due to extensive peritonitis and septicemia. A delay in operation and extensive contamination of the peritoneum were most important causes for mortality.

CONCLUSION

Peritonitis due to non-traumatic origin is one of the most common emergency surgical conditions. Most important presenting complaint in this condition is pain abdomen; followed by distension of abdomen, constipation and vomiting. Erect abdomen X-ray, diagnostic peritoneal tapping and USG abdomen are of utmost importance in diagnosis.

Most common procedure employed for management is primary closure of perforation. Resection and anastomosis is also done for intestinal perforation. Peptic ulcer perforations do not require definitive surgery as effective acid reducing drugs are available. Most common cause of non-traumatic perforation peritonitis is peptic ulcer perforation followed by ileal and appendicular perforation.

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