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AN OBSERVATIONAL STUDY OF PATIENTS PRESENTING WITH PERFORATION PERITONITIS AT A TERTIARY CARE HOSPITAL IN CENTRAL BIHAR

General Surgery

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ABSTRACT

Objective: Peritonitis is common surgical emergency in which there occurs inflammation of peritoneum and peritoneal cavity. It is a serious condition with a mortality rate of up to 20%, and it is the third most common cause of surgical abdomen after appendicitis and intestinal obstruction. So, the aim of the study was to evaluate the clinical and etiological profile of perforation peritonitis in our hospital. **Method:** This study was conducted in a tertiary care centre of central Bihar, over a period of 1 year in which 40 patients diagnosed with perforation peritonitis were evaluated. Diagnosis was based on history, clinical examination, and required investigations. Non-traumatic perforation with regard to age, sex, causes, clinical presentation, diagnostic modalities required was evaluated. **Result:** The site of perforation was gastric 27.5%, duodenum 20%, jejunum 5%, ileum 35%, appendix 10% and colon 2.5%. Main causes included peptic ulcer 42.5%, typhoid 25% and few cases of trauma, tuberculosis, appendicitis and malignancy. Peritonitis was universal. Primary repair, resection with anastomosis, appendectomy and stoma were the operative procedures. Morbidity rate was 60.0% and mortality rate was 12.5%. **Conclusions:** Perforation peritonitis is a frequently encountered surgical emergency. Various factors like age, sex, duration, site of perforation, extent of peritonitis and delay in surgical intervention are associated with morbidity and mortality. Commonest site of perforation was gastro-duodenal while commonest cause was peptic ulcer disease. Morbidity and mortality were comparable with other studies.

KEYWORDS

Perforation; peritonitis; peptic ulcer

INTRODUCTION

The most common surgical emergency in general surgery is perforation peritonitis [1]. It is a serious condition with a mortality rate of up to 20%, and it is the third most common cause of surgical abdomen after appendicitis and intestinal obstruction [2]. Peptic perforation, appendicular perforations, typhoid, intestinal tuberculosis, Meckel's diverticulum, diverticulitis, trauma, gastrointestinal carcinomas, foreign body ingestion, gall bladder perforation secondary to gall stones, perforation due to obstruction, and iatrogenic perforation are some of the etiological conditions [3]. Because the signs and symptoms are typical, a clinical diagnosis of peritonitis is usually possible. The mainstay of treatment is adequate resuscitation, antibiotics, and surgical intervention to treat the underlying pathologic process, eliminate the source of bacterial contamination, reduce the degree of bacterial contamination in the peritoneal cavity, and prevent recurrent or residual infection [4,5]. Incidence, perforation site, and age are all varied in the developing world, and new trends are emerging. In the developing world, the etiological spectrum differs from that in the developed world [6]. Despite advances in surgical technique, antibiotic medication, and perioperative care, perforated peritonitis still has a significant morbidity and fatality rate [7]. The aim of this study to discuss clinical profile of perforation peritonitis at a tertiary care hospital in central Bihar.

METHODS

This study was conducted prospectively in the Department of General Surgery of ESICMCH Bihta on forty patients for a period of one year. Cases were enrolled on basis of random numbers. Consent was obtained and then included in the study. The demographic data pertaining to age, gender, residence and occupation were recorded. Detailed history of present illness and treatment received was noted along with past, family and personal history. Present complaints included reference to abdominal pain, vomiting, fever, trauma, abdominal distension, constipation, dyspepsia, loss of weight, jaundice, and any other symptoms. Attempt was made to determine the etiology of perforation and time interval between the event and presentation to the hospital. History of smoking, alcohol intake, drug intake and food habits were noted. Past history of diabetes, hypertension, tuberculosis, jaundice and previous surgeries was also noted.

Detailed physical examination was duly recorded. General physical examination pertained to clinical condition of the patient with special reference to dehydration and shock. Note was made of build, nourishment, pallor, icterus, lymphadenopathy, edema, clubbing, cyanosis, respiratory rate, temperature, pulse and blood pressure. In systemic examination, particular note was made of abdominal findings related to clinical signs of peritonitis and perforation. Examination details included distension, scars, visible mass and pulsations on inspection; tenderness, guarding, rigidity, palpable mass, organomegaly, distention and fluid thrill on palpation; shifting dullness and obliteration of liver dullness on percussion and bowel sounds on auscultation. Hernial sites, gentalia and rectal examination findings were included. Note was made of examination of respiratory, cardiovascular and central nervous systems.

Enrolled patients were investigated as indicated for evaluation of the clinical status, confirmation of perforation, etiology and complications suspected or observed. Laboratory investigations were carried out as per clinical relevance, including hemogram, blood sugar, electrolytes, renal function tests, liver function tests, blood culture, Widal, urine examination, erect and supine abdominal x-ray, ultrasonography and other investigations as required.

The number, size and location of perforation was recorded and operative management noted. Post-operative analysis was done. Any complication if present was noted.

The data collected in respect of various variables were statistically analysed. Mean and Standard Deviation were computed for the quantitative variables. Frequency and percentages were calculated for qualitative variables. Chi square test was applied to analyse the association between attributes. Z test of proportion and analysis of variance (ANOVA) was applied to see the difference between means of group(s). The data were recorded on Microsoft excel. The analysis was performed by using software SPSS 20.0. A p value <= 0.05 was considered as significant.

RESULTS

Age and Sex distribution

The majority of the cases, 30 (75.0%) were males while only 10 (25.0%) were females, with a male: female ratio of 3:1. The age of the patients ranged from 18 to 70 years with a mean of 37.63±14.26 years.

Table 1: Age and gender wise distribution of patients.

Age (years)	Gender				Total (N = 40)	
	Male (n = 30)		Female (n = 10)			
	n	%	n	%	n	%

≤19	2	6.7	2	20.0	4	10.0
20-39	12	40.0	7	70.0	19	47.5
40-59	13	43.3	1	10.0	14	35.0
≥60	3	10.0	0	0.00	3	7.5

Chi square = 6.135; p = 0.105; non-significant.

Table 2: Mean age of patients.

Gender	n	Mean±SD
Male	30	40.53±14.78
Female	10	28.90±8.07
Total	40	37.63±14.26
p value		0.023; significant

The mean age of males was 40.5±14.8 years, while that of females was 28.9±8.1 years, and this was statistically significant (p=0.023). The maximum number of cases was in the age group of 20-39 (47.5%) while the least number was in the age group of ≥61 (7.5%).

Site and characteristics of perforation

The site of perforation was ileum 35.0% gastric, 27.5% and duodenum, 20.0%, gastro-duodenal 47.5%. Perforation of appendix and large intestine were less common. Gastric and duodenum perforations were mainly in males, 94.7% whereas at the other sites males were 57.1%. Age distribution showed that there was no statistical difference between site of perforation and various age groups.

Table 3: Sex distribution in relation to site of perforation.

Site of perforation	Gender				Total (N = 40)	
	Male (n = 30)		Female (n = 10)			
	n	%	n	%	n	%
Gastric	11	36.7	0	0.00	11	27.5
Duodenum	7	23.3	1	10.0	8	20.0
Jejunum	0	0.00	2	20.0	2	5.0
Ileum	10	33.3	4	40.0	14	35.0
Appendix	2	6.7	2	20.0	4	10.0
Colon	0	0.00	1	10.0	1	2.5

Table 4: Age distribution in relation to site of perforation.

Site of perforation	Age (years)								Total (N = 40)	
	≤19		20-39		40-59		≥60			
	n	%	n	%	n	%	n	%	n	%
Gastric	1	25.0	4	21.1	4	28.6	2	66.7	11	27.5
Duodenum	1	25.0	3	15.8	4	28.6	0	0.00	8	20.0
Jejunum	1	25.0	1	5.3	0	0.00	0	0.00	2	5.0
Ileum	1	25.0	8	42.1	5	35.7	0	0.00	14	35.0
Appendix	0	0.00	2	10.5	1	7.1	1	33.3	4	10.0
Colon	0	0.00	1	5.3	0	0.00	0	0.00	1	2.5

The exact location of perforation at different sites shows a wide area of involvement. However, in gastric perforation the majority were in the pre-pyloric region (9 out of 11 cases, 81.8%). Similarly, most of the perforations in the duodenum were in the 1st part (6 out of 8 cases, 75.0%). Ileal perforations were widely distributed but were more in the terminal ileum within 30 cm from the ileo-caecal junction (8 out of 12 cases, 75.0%, in single perforations).

Almost all the cases in the present series had a single perforation (37 cases, 92.5%). Two or more perforations were seen in only 3 cases of ileal perforation, including a case with 2 perforations and another two cases with multiple perforations.

The size of perforation was small, less than 1 cm maximum diameter, in 14 cases (35.0%) while it was of medium size, i.e., 1cm to less than 2 cm, in another 13 cases (32.5%). Large perforation of 2 cm or more was noted in 13 cases (32.5%). The size varied with the site of perforation. Gastric perforation was small in almost half of cases, 45.5% (5/11) compared to ileum where small perforations constituted only 14.3% (2/14). Most of the large perforations ,53.8% (7/13) were in the ileum.

Table 5: Location of perforation at different sites.

Location of perforation	No. of cases
Stomach	
Antrum	1
Anterior wall	1
Pre-pyloric	9
Duodenum	
1st part	6
2nd part	1
3rd part	1
Ileum (distance from IC junction)	
10 cm	3
10-30 cm	5
>30 cm	4
Multiple	2
Large intestine	
Ascending colon	1

Table 6: Site of perforation in relation to etiology.

Site of perforation	Etiological factors						Total (N = 40)
	Gastric (n = 11)	Duodenum (n = 8)	Jejunum (n = 2)	Ileum (n = 14)	Appendix (n = 4)	Colon (n = 1)	
Peptic ulcer	10 (62.5)	7 (43.8)	0	0	0	0	17 (42.5)
Typhoid	0	0	0	10 (100)	0	0	10 (25.0)
Trauma	1 (33.3)	1 (33.3)	0	1 (33.3)	0	0	3 (7.5)
Tuberculosis	0	0	2 (100.0)	0	0	0	2 (5.0)
Appendicitis	0	0	0	0	4 (100)	0	4 (10.0)
Malignancy	0	0	0	0	0	1 (100)	1 (2.5)
Volvulus	0	0	0	1 (100)	0	0	1 (2.5)
Non-specific infection	0	0	0	2 (100)	0	0	2 (5.0)

Figures in parentheses indicate percentages

Etiology of perforation

The etiological background dictated the site of perforation. Peptic ulcer disease was the cause of perforation in 42.5% (17 cases) involving the stomach in 10 cases and duodenum in 7 cases. Typhoid accounted for 25.0% (10 cases), all in the ileum. Acute appendicitis resulted in perforation of the appendix in 4 cases (10%) while trauma and tuberculosis accounted for 3 and 2 cases respectively. There was 1 case each with malignancy and volvulus. Two cases had non-specific infection.

Outcome

The mortality rate in this study was 12.5% (5 cases). Of the deaths, 3 occurred in patients with ileal perforation. One case had gastric perforation and another had complicated appendicitis with extensive gangrene and sepsis. All these patients expired within 7 days of admission and 3 of the 5 cases expired within 3 days indicating the serious clinical condition at presentation.

DISCUSSION

Age and sex distribution

The majority of the cases were males, with a male: female ratio of 3:1. The male preponderance has been uniformly reported especially from the developing world, with wide variation of 3.3:1 to 9:1.5,6 The age of the patients in this study ranged from 18 to 70 years with a mean of 37.6±14.3 years. The mean age of males was higher than that of females, and this was statistically significant (p=0.023).

Site and characteristics of perforation

The site of perforation in this study was ileum, in 35.0%, gastric, 27.5% and duodenum, 20.0%. Perforation of appendix and large intestine were less common. Gastric and duodenum perforations were mainly in males, 94.7%, whereas at the other sites males constituted 57.1%. In a retrospective analysis of 250 patients with peritonitis over a decade at a referral surgical unit in New Delhi, Dorairajan et al also

revealed that perforations of the upper gastrointestinal tract occur in the majority unlike the west where perforations of the lower gastrointestinal tract predominate. Batra et al found that the site of perforation was gastroduodenal, small bowel, appendix, colon, rectum in 80.3%, 14.1%, 3.8%, 1.3% and 0.6% respectively.[7,8]

Almost all the cases, 92.5%, had a single perforation. Two or more perforations were seen in only 3 cases out of the 14 cases of ileal perforation, i.e., 78.6% of ileal perforations were single. This is consistent with the observation of Freeman, who studied 41 cases of ileal perforation and found that the majority of cases, 78%, had a single perforation.[9]

Clinical features

In this study the common symptoms were consistent with the typical complaints or abdominal pain, vomiting, constipation and abdominal distension in various combinations. The commonest chief complaint was acute abdominal pain which was seen in as many as 95.0% cases, leaving only 2 cases with trauma who had other overwhelming presenting features. Nausea/vomiting was reported in 50.0% while obstipation and abdominal distension was complained of in 27.5% and 30.0% patients respectively.

The typical physical signs of intestinal perforation, accompanied by peritoneal fluid collection viz. abdominal distension, tenderness, guarding and rigidity, absent bowel sounds and free fluid in the abdominal cavity were elicited in all cases.

Etiology of perforation

Peptic ulcer disease was the cause of perforation in 40.0% involving the stomach in 10 cases and duodenum in 7 cases. Typhoid accounted for 27.5%, all in the ileum. Acute appendicitis resulted in perforation of the appendix in 10% while trauma and tuberculosis accounted for 3 and 2 cases respectively. There was 1 cases each with malignancy and volvulus. Two cases had non-specific infection.

These studies find the ileum to be the most common site of involvement. The distribution in western countries showing a predominance of lower gut perforation appears to be a reflection of decreasing incidence of peptic ulcer disease and resultant perforation of duodenum and stomach. Typhoid, the major cause of ileum perforation in countries like India, is hardly a cause in the West. On the other hand, malignancy, particularly of the large intestine, emerges as a common cause of perforation in the latter

Mortality

In Indian studies, a large series of 260 cases by Agarwal et al10 reported an overall mortality of 10%, while it was found to be 7% in a retrospective study on 400 patients by Bali et al, 11.5% of 260 cases by Shrestha et al and 13% out of 77 cases by Yadav et al.10,11,12

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