

Descriptive study of non-traumatic perforative peritonitis at a tertiary care hospital

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Abstract

Introduction: Peritonitis is defined as inflammation of the serosal membrane that lines abdominal cavity and organs contained therein. Secondary peritonitis caused due to non-traumatic hollow viscous perforation is a common occurrence in this country which requires emergency surgical intervention. In our prospective study we tried to find out the incidence of perforative peritonitis which presented to our tertiary care hospital with respect to age and gender, relative frequency of anatomical site of perforation, their causes, presentation, treatment and outcome.

Methods: The study has been based on the analysis of 98 cases of non-traumatic perforated peritonitis patients admitted to our tertiary hospital, during the study period with prior inclusion criteria.

Each patient was examined thoroughly, after taking a detailed history and social demographic factors were noted. Cases were admitted as emergency and relevant immediate investigations were done. The diagnosis was made with history, clinical features and radiology to support the diagnosis.

Out of 98 cases, 92 underwent emergency laparotomy, at laparotomy the site of perforation, its pathological conditions, the amount of peritoneal contamination were noted. Perforation site specific operative procedures were done. In post-operative period, patients were closely monitored and complications were managed appropriately.

Results: Out of 98 cases 84(85.7%) were males. 25(32.7%) of the patients were in a age group of 21-30 years. Majority (35.7%) of the cases presented after 24-48 hours to our hospital. Pain abdomen was the most consistent symptom present in all the cases. Smoking (43.12%) and NSAIDs(21.4%) were the most important risk factors. Duodenum was the most common site of perforation (43.9%) followed by ileal (24.5%) and gastric (21.4%). In postoperative period 34.3% of patients had some form of complication and death occurred in 8 patients (8.16%).

Conclusion: Non-traumatic perforative peritonitis is more common in young age group (21-30 years) with male preponderance and is more common in rural population. Smoking and NSAIDs are the most common causative factors although it is multifactorial. Peptic ulcer disease is the most common cause of perforation. Delayed presentation to the hospital is the most common cause of morbidity and mortality.

Early diagnosis, appropriate risk stratification and treatment reduces the morbidity and mortality associated with perforative peritonitis.

Keywords: Perforation, peritonitis, peptic ulcer disease

Introduction

Peritonitis can be defined in various ways. The infection of peritoneal cavity usually occurring in patients with pre-existing ascites without relation to diseases of abdominal viscera is called primary peritonitis. Perforation of bowel and intestinal ischemia leading to inflammation of peritoneum is called secondary peritonitis which is more common. The recurrent infection of peritoneal cavity that follows an episode of either primary or secondary peritonitis is called tertiary peritonitis ^[1, 2]. The management of peritonitis is still highly complex and represents a challenge for clinicians despite the great progress in intensive care support, antimicrobial therapy and surgical techniques ^[3]. With mortality of up to 20%, peritonitis is a dominant cause of death due to surgical infections ^[3].

The most important risk factors for peptic ulcer perforation include smoking and use of Non-steroidal anti-inflammatory drugs ^[4]. Non-operative management can be opted in selective cases identified to have a spontaneously sealed perforation proved by water soluble contrast gastroduodenogram. Omental patch closure is the standard operative method, but today this can be done by laparoscopic method ^[5].

Ileal perforation is a common surgical emergency in the tropical countries. Due to high incidence of enteric fever and tuberculosis it constitutes 5th commonest cause of abdominal emergencies in these countries ^[6].

Acute mesenteric ischemia, an uncommon cause of abdominal pain with overall incidence being very low (0.09 to 0.2% of all acute admissions to emergency departments) ^[7, 8, 9].

Colonic diverticula refers to sac like protrusions in the wall of large bowel. It's high prevalence in the western world is presumably due to lack of dietary fibre and lifestyle changes ^[10]. Acute diverticulitis complicated by gross perforation and peritonitis is a surgical emergency which is managed by fluid resuscitation, broad-spectrum antibiotics and laparotomy culminating in colonic resection and fecal diversion called as Hartmann procedure.

This study is being done to know the relation of various sites of perforation in GIT with respect to age, gender, risk factors, clinical presentations and outcomes.

Objectives

1. To find out the relative frequency and anatomical sites of perforation with respect to age and gender.
2. Analysis of various clinical features and also reliability of investigations like x-ray abdomen detecting the pathology.
3. Evaluation of outcome with respect to complications, morbidity/mortality along with socio-demographic factors which influence the same.

Methodology

This study has been based on the analysis of 98 cases of non-traumatic perforative peritonitis admitted to tertiary care hospital during the study period. Patient admitted with particular criteria fixed during the study period was taken and cases were selected by purposive sampling and a prospective study was undertaken.

Each patient was examined thoroughly, after taking a detailed history & socio- demographic

factors were noted. Cases were admitted as emergency and possible immediate investigations were done. The diagnosis was made with history, clinical features and X ray abdomen erect posture to support the diagnosis.

Of the 98 cases of perforation peritonitis, 92 underwent emergency laparotomy. At laparotomy the site of perforation, its pathological condition and the amount of peritoneal contamination were determined. The procedures adopted in the management were omental patch closure, primary repair, resection and anastomosis, tube cecostomy, loop ileostomy, Right hemicolectomy + ileotransverse anastomosis/end ileostomy and Hartmann's procedure as per individual case requirement.

Post operatively cases were closely monitored for optimum recovery and for development of any postoperative complications.

Results

Table 1: Age and gender

Age	Male	Female	Total
<20	4	1	5
21-30	25	7	32
31-40	13	4	17
41-50	16	1	17
51-60	17	0	17
>60	9	1	10
Total	84	14	98

Of the study population, majority were in relatively younger age group (21-30 years).

Table 2: Risk factors

Risk factors	No. of cases	Percentage
Smoking	17	17.3
Drugs	10	10.2
Alcohol	9	9.2
Smoking + alcohol	11	11.2
Smoking + drugs	11	11.2
Smoking + drugs + alcohol	5	5.1
Others	3	3.1

44 out of 98 patients were smokers, 27 patients had chronic NSAIDs usage.

Table 3: Correlation of site of perforation with gender

Site of perforation	Total no.	Male No. (percentage)	Female No. (percentage)
Duodenum	43	41(95%)	2(5%)
Gastric	21	19(90%)	2(10%)
Ascending colon	1	1(100%)	-
Caecum	1	-	1(100%)
Hepatic flexure	1	1(100%)	-
Sigmoid diverticulum	1	1(100%)	-
Ileum	24	16(67%)	8(33%)
Conservative management	6	5(83%)	1(17%)
Total	98	84	14

Chi square test: p value <0.01 statistically significant.

Peptic ulcer perforation had highest frequency of presentation (43-duodenum and 21-stomach) and majority of them were males (41/43 duodenal and 19/21 stomach). Amongst female's majority had ileum preparation (8/14).

Table 4: Correlation of duration of presentation to the hospital after the onset of symptoms with the outcome

Duration of presentation to the hospital	Expired	Discharged
<24 hours	0	16
24-48 hours	1	34
48-72 hours	2	35
>72 hours	5	15
Total	8	90

p value: <0.016 statistically significant.

Amongst eight deaths, five patients presented to our hospital after three days. None of the patients presenting to the hospital less than 24 hours after the onset of symptoms succumbed.

Table 5: Correlation of duration of stay in the hospital with post-operative complications

Duration of stay (days)	Complications present	Complications absent	Total
<5	3	1	4
6-10	9	65	74
11-15	9	3	12
>15	6	2	8
Total	27	69	8

p value: 0.001 statistically significant.

Those patients with post-operative complications had long duration of stay in the hospital. Those patients with less than five days of stay in the hospital were brought to our hospital in a state of unresuscitable shock and has succumbed.



Fig 1: Duodenal (D1) perforation



Fig 2: Modified Graham's Omental patch repair

Discussion

A total of 98 patients were included by purposive sampling according to prefixed criteria in our study.

Majority of them were males, majority of the patients had peptic ulcer perforation and they

belong to rural area. Those patients with delayed presentation had more post-operative complications.

Majority of patients were in a age group of 21-30 >40-50 in our study which was comparable to two of the previous studies shown below.

Showing peak age incidence by various authors

Authors	Peak age in years
Palanivelu <i>et al.</i> (2007)	20-30 years
Philipol Chalya <i>et al.</i> (2011)	40-50 years
Present series	21-30 years

It's the age of the patient, rather than type of surgery which influences the mortality in perforation peritonitis with lethality being high in elderly as reported by Savnes C^[11].

In our studied series 86% were males and 14% were females and the male-female ratio being 6:1. Perforation is more common in males than females, because males were subjected to more stress and strain of life and female sex hormone offer some security against perforation as claimed by Skovgaard (1997)^[12].

Showing gender incidence by various authors

Authors	Male: Female ratio
Palanivelu <i>et al.</i> (2007)	12.3: 1
Chalya <i>et al.</i> (2011)	1.3:1
Present series	6:1

With highly significant dose- response relationship, smoking increased the risk of perforation to 10 fold in the age group of 15-74 years as showed by Hermansson M and Ekedhal A *et al.*^[13]. In the west, use of NSAIDs is an important cause of peptic ulcer perforation. NSAIDs inhibit prostaglandin synthesis, so further reducing gastric mucosal blood flow^[14]. Smoking and use of non-steroidal anti-inflammatory drugs are important risk factors for perforation. In our study, 44 patients out of 98 patients were smokers and 27 had history of chronic NSAIDs usage.

Incidence of causal factors

Authors	Smoking	NSAIDs
Palanivelu <i>et al.</i> (2007)	72.5%	10%
Chalya <i>et al.</i> (2011)	64.3%	10.7%
Present series	43.12%	21.4%

Nakeeb A and Fikrya (2002) analyzed that time interval between onset of acute symptoms and surgery was less than or equal to 24 hours, mortality rate is 12% and if more than 24 hours, the mortality rate is 21%.

In our study most of morbidity & mortality was observed in those patients who reached hospital > 48 hrs after onset of symptoms. Out of 8 deaths, 7 of them presented to our hospital after 48 hours of onset of symptoms, owing to septicaemia and multi organ dysfunction syndrome.

Conclusion

1. Amongst the perforations of gastro intestinal tract, most common cause is duodenal perforation (43.9%), followed by ileal (24.5%) and gastric perforation (21.4%), which is more common in males (M:F=6:1).
2. Smoking (72.5%) and drugs (NSAIDs, 21.4%) being common causative factors, we found that perforation peritonitis is a multifactorial disease in our study.
3. Amongst the factors affecting mortality and morbidity, delayed presentation of the patient (>24hours) to the hospital is a most important factor. Proper referral mechanism and adequate health education in public can help reducing this.
4. Peritonitis and it sequel management involves lots of skill, expensive modalities of monitoring and treatment which has to be utilized judiciously based on risk stratification.

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