

## ASSESSMENT OF RISK FACTORS INVOLVED IN BENIGN GASTROINTESTINAL PERFORATIONS

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Received: 11/10/2017

Revised: 18/11/2017

Accepted: 25/12/2017

### ABSTRACT

**Background:** Gastrointestinal perforation leading to peritonitis is a prevalent surgical emergency in India. Despite advancements in perioperative care, antimicrobial treatments, and intensive care support, perforation peritonitis remains associated with high morbidity and mortality rates. **Material & Methods:** The present study was a descriptive cross-sectional type of study which was carried out in the department of General Surgery, of our tertiary care hospital. The study duration was of six month. A sample size of 40 was calculated at 95% confidence interval at 10% acceptable margin of error. Patients diagnosed with gastrointestinal perforations and exhibiting signs and symptoms of peritonitis were included in this study.

**Results:** In the present study, out of total study participants, based on the site of perforation the stomach was the most common site of perforation, accounting for 35% (14 cases). Appendicular perforations comprised 25% (10 cases), ileal perforations 20% (8 cases), duodenal perforations 12.5% (5 cases), jejunal perforations 5% (2 cases), and colonic perforations only 2.5% (1 case). The leading cause of perforations in 19 (47.5%) cases which was followed by appendicitis in 10 (25%) cases, typhoid in 7 (17.5%) cases, trauma in 2 (5%) and tuberculosis among 2 (5%) cases. **Conclusion:** We concluded from the present study that that most common cause of perforation peritonitis was peptic ulcer disease followed by appendicitis, typhoid, tuberculosis of bowel and trauma to hollow viscus.

**Keywords:** perforation peritonitis, peptic ulcer disease, appendicitis.

### INTRODUCTION

Abnormal Gastrointestinal perforation leading to peritonitis is a prevalent surgical emergency in India. Despite advancements in perioperative care, antimicrobial treatments, and intensive care support, perforation peritonitis remains associated with high morbidity and mortality rates (1). A perforation is defined as an abnormal opening in a hollow organ or viscus, originating from the Latin word "perforatus," meaning "to bore through." Untreated perforation peritonitis can lead to severe complications such as bacteremia, generalized sepsis, multiorgan failure, and shock (2). Perforations can occur

anywhere along the gastrointestinal tract, from the esophagus to the rectum (3).

While diagnosis is often apparent clinically, radiological confirmation is usually sought prior to surgery. Factors like delayed treatment, poor clinical presentation upon admission, the type of perforation, and associated complications significantly influence outcomes (4). Risk factors for gastrointestinal perforations include infectious diseases such as typhoid, tuberculosis, Helicobacter pylori infection, HIV, as well as conditions like appendicitis, peptic ulcers, trauma, chronic alcohol use, smoking, NSAID

abuse, malignancy, and diverticulitis (5). In India, delayed hospital presentations are common, with patients often arriving with advanced generalized peritonitis, septicemia, and contamination due to prior over-the-counter medications or treatment from local practitioners (6).

Common causes of perforation peritonitis include duodenal ulcers, ileal typhoid perforations, small bowel tuberculosis, stomach perforations, and acute appendicitis. The ileum, duodenum, stomach, appendix, jejunum, and colon are among the most frequently affected structures (7). Early diagnosis, risk assessment, prognosis evaluation, and prompt treatment are essential for mitigating the effects of perforation peritonitis, particularly in low-income rural areas of India. These measures are crucial to preventing the morbidity and mortality caused by the leakage of intestinal contents. This study aims to investigate the relationship between various risk factors associated with gastrointestinal perforations.

## **MATERIALS & METHODS**

The present study was a descriptive cross-sectional type of study which was carried out in the department of General Surgery, of our tertiary care hospital. The study duration was of six month. A sample size of 40 was calculated at 95% confidence interval at 10% acceptable margin of error by epi info software version 7.3. Only those patients who matched the inclusion and exclusion criteria were enrolled in present study. Institutional Ethics Committee Clearance was obtained before start of study and written and informed consent for the procedure was obtained from all the patients. Strict confidentiality was maintained with patient identity and data and not revealed, at any point of time.

Patients diagnosed with gastrointestinal perforations and exhibiting signs and symptoms of peritonitis were included in this study. These cases involved perforations in the esophagus, stomach, small intestine, colon, rectum, and appendix. Data collection was carried out with informed consent using a standardized questionnaire, which recorded detailed medical histories, physical examinations, and findings from relevant blood and radiological investigations. All patients underwent surgical intervention, with preoperative findings compared to intraoperative observations and histopathology reports where feasible. Following initial resuscitation, patients underwent surgery, with peritoneal fluid collected for culture. Depending on the location of the perforation, procedures such as closure with Graham's omentoplasty, limited resection with end-to-end anastomosis, or appendectomy were performed. Postoperatively, patients were monitored daily until discharge or death and were administered broad-spectrum antibiotics for five days. All data were entered in the MS office 2010 spread sheet and Epi Info v7. Data analysis was carried out using SPSS v22. Qualitative data was expressed as percentage (%) and Pearson's chi square test was used to find out statistical differences between the study groups and sensitivity, specificity, positive predictive value and negative predictive value were calculated. If the expected cell count was < 5 in more than 20% of the cells then Fisher's exact test was used. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05 and highly significant if p value less than 0.01.

## **RESULTS**

In the present study, we enrolled 40 patients diagnosed with gastrointestinal perforations and

exhibiting signs and symptoms of peritonitis at our tertiary care hospital during the study duration. Only those patients who matched the inclusion and exclusion criteria were enrolled in present study. The majority of cases were observed in the 40–50 and 30-40 years age group, accounting for 30% of the total respectively. This was followed by the 20–30 age group (25%) and the 50–60 age group (15%). Out of the 40 patients, 75% were male, and 25% were female. (Table 1)

**Table 1: Distribution of study participants according to study parameters.**

Parameters		No. of patients
Gender	Male	30 (75%)
	Female	10 (25%)
Age group	20-30 years	10 (25%)
	30-40 years	12 (30%)
	40-50 years	12 (30%)
	50-60 years	6 (15%)

In the present study, out of total study participants, based on the presenting symptoms abdominal pain was reported universally across all patients (100%). Vomiting was a symptom in 32 (80%) of cases, followed by abdominal distension 30 (75%), fever 28 (70%), and constipation 22 (55%). (Table 2)

In the present study, out of total study participants, based on the site of perforation the stomach was the most common site of perforation, accounting for 35% (14 cases). Appendicular perforations comprised 25% (10 cases), ileal perforations 20% (8 cases), duodenal perforations 12.5% (5 cases), jejunal perforations 5% (2 cases), and colonic perforations only 2.5% (1 case). (Table 3)

**Table 2: Distribution of study participants according to study parameters.**

Study parameters		(n=40)
Presenting symptoms	Pain abdomen	40 (100%)
	Vomiting	32 (80%)
	Abdomen distension	30 (75%)
	Fever	28 (70%)
	Constipation	22 (55%)

**Table 3: Distribution of study participants according to study parameters.**

Study parameters		(n=40)
Site of perforation	Stomach	14 (35%)
	Appendix	10 (25%)
	Ilium	8 (20%)
	Duodenum	5 (12.5%)
	Jejunum	2 (5%)
Colon	1 (2.5%)	

**Table 4: Distribution of study participants according to study parameters.**

Study parameters		(n=40)
Etiology of perforation	Peptic ulcer	19 (47.5%)
	Appendicitis	10 (25%)
	Typhoid	7 (17.5%)
	Trauma	2 (5%)
	Tuberculosis	2 (5%)

In the present study, out of total study participants, based on the etiology of perforation peptic ulcers were the leading cause of perforations in 19 (47.5%) cases which was followed by appendicitis in 10 (25%) cases, typhoid in 7 (17.5%) cases, trauma in 2 (5%) and tuberculosis among 2 (5%) cases. (Table 4)

## DISCUSSION

In the present study, we enrolled 40 patients diagnosed with gastrointestinal perforations and exhibiting signs and symptoms of peritonitis at

our tertiary care hospital during the study duration. Only those patients who matched the inclusion and exclusion criteria were enrolled in present study. The majority of cases were observed in the 40–50 and 30–40 years age group, accounting for 30% of the total respectively. This was followed by the 20–30 age group (25%) and the 50–60 age group (15%). Out of the 40 patients, 75% were male, and 25% were female. Similar findings were reported in a study conducted by Dinesh Yadav et al among 77 patients of perforation peritonitis and reported that most common cause of perforation peritonitis was duodenal ulcer (26.4 %) and typhoid perforation (26.4 %), followed by bowel tuberculosis (10.3 %) and stomach perforation (9.2 %) and acute appendicitis (5 %) (8).

In the present study, out of total study participants, based on the presenting symptoms abdominal pain was reported universally across all patients (100%). Vomiting was a symptom in 32 (80%) of cases, followed by abdominal distension 30 (75%), fever 28 (70%), and constipation 22 (55%). Similar findings were reported in a study conducted by Sujoy Mukherjee et al among 221 patients of perforation peritonitis and reported that 62% patients presented with complaints of abdomen distension and 42% patients gave positive history of chronic NSAID intake (9).

In the present study, out of total study participants, based on the site of perforation the stomach was the most common site of perforation, accounting for 35% (14 cases). Appendicular perforations comprised 25% (10 cases), ileal perforations 20% (8 cases), duodenal perforations 12.5% (5 cases), jejunal perforations 5% (2 cases), and colonic perforations only 2.5% (1 case). Similar findings were reported in a study conducted by Ishaq Nabi et al among 1908 patients of perforation peritonitis and reported that most common cause of perforation

peritonitis was peptic ulcer disease followed by appendicitis, typhoid, tuberculosis of bowel and trauma to hollow viscus (10).

In the present study, out of total study participants, based on the etiology of perforation peptic ulcers were the leading cause of perforations in 19 (47.5%) cases which was followed by appendicitis in 10 (25%) cases, typhoid in 7 (17.5%) cases, trauma in 2 (5%) and tuberculosis among 2 (5%) cases. Similar findings were reported in a study conducted by Rajandeep Singh Bali et al among 400 patients of perforation peritonitis and reported that most common cause of perforation peritonitis was peptic ulcer disease (150 duodenal ulcers followed by 29 gastric ulcers) and appendicitis (74 patients), typhoid (48 cases), tuberculosis of bowel (40 cases), and trauma to hollow viscus (11).

## CONCLUSION

We concluded from the present study that the most common cause of perforation peritonitis was peptic ulcer disease followed by appendicitis, typhoid, tuberculosis of bowel and trauma to hollow viscus. Early identification of at-risk patients, timely surgical intervention, administration of broad-spectrum antibiotics, effective resuscitation, correction of electrolyte imbalances, and definitive treatment are essential for improving outcomes and reducing morbidity and mortality rates. These findings highlight the critical need for enhanced healthcare interventions.

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