AETIOPATHOLOGICAL OBSERVATION ON SMALL BOWEL PERFORATION AND ITS MANAGEMENT AT M.K.CG. MEDICAL COLLEGE, BERHAMPUR – A PROSPECTIVE STUDY

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ABSTRACT Background: Gastrointestinal perforations constitute one of the commonest surgical emergencies encountered by surgeons in India. Gastrointestinal perforation can occur at any anatomical location from the upper oesophagus to the anorectal junction, the most common site being the small intestine. Small bowel perforation can be secondary to many factors, the most common being inflammation, infection, obstruction, trauma, or invasive surgery. Early operative procedures are highly beneficial to patients as small bowel perforation has high mortality and morbidity. Aims and objectives: To study various causes and clinical features of small bowel perforations and various surgical procedures undertaken with its impact on mortality and morbidity at M.K.C.G. Medical College and Hospital, Berhampur, Odisha. Materials and methods: All the patients of small bowel perforation of both sexes and of different ages, who were admitted in the Department of General Surgery of M.K.C.G. Medical College and hospital, Berhampur, Ganjam, Odisha during the period between July 2018, to June 2020 (including 6 months of follow up period) were included in this study. Results: Out of 52 patients in our study group,41 patients (78.84%) were male with mean age of presentation 35.76 years. Abdominal pain and distension were the most common mode of presentation(100%) followed by vomiting (44.23%), fever(36.5%) and constipation (32.7%). Perforation due to duodenal ulcer was found to be the most common aetiology(69.25%) followed by trauma (19.25%), TB (3.85%), Malignancy (3.85%) while Typhoid & Chron’s disease being the least common causes(1.9%). Majority of patients were managed by toileting & simple closure of the perforation (80.77%) while 13.47% patients required resection & anastomosis,3.84% patients by drainage only and 1 patient (1.9%) requiring ileostomy. Conclusion: Duodenal perforation is the most common cause of small intestinal perforation. Smoking and consumption of alcohol & NSAIDS are the most important risk factors for small bowel perforation. Patients mainly presented with abdominal pain and distension with features of peritonitis. Xray abdomen suggested of pneumoperitoneum in most of the patients. Resuscitation followed by closure of perforation with omental patch was the most common management procedure done.

KEYWORDS Perforation, Peritonitis, Laparotomy
Introduction

Abdominal emergencies have remained a great challenge from time immemorial. Small intestinal perforation and peritonitis are common abdominal emergencies that need the attention of all instantaneously. Intestinal perforation results from damage to the mucosa of the intestinal wall due to violation of the closed system. This exposes the structures within the peritoneal cavity to gastrointestinal contents. Bowel perforation can be secondary to many factors: inflammation, infection, obstruction, trauma, or invasive procedure.[1]

Delays in resuscitation and definitive surgery will rapidly develop into septic shock, multiple organ dysfunction, and death. Hence it should be one of the first diagnoses to be considered and excluded for all patients with acute abdominal pain.[2] Presentation to hospital in these cases varies depending upon access availability, patient awareness and, of course, economy and, in late cases, established generalized peritonitis with purulent/faecal contamination and varying degree of septicemia.[3]

In India, gastroduodenal perforation is one of the most common sites, followed by intestinal, appendicular perforations. However, the relative incidence, location, aetiology etc., of various perforations show large regional differences. Ileal perforation is another common surgical emergency in the Indian subcontinent and tropical countries. [4]

According to reports, the high incidence of enteric fever and tuberculosis in the Indian subcontinent is the fifth most common cause of abdominal emergencies. Despite the advancement of modern diagnostic facilities and treatment programs, the disease has a sudden onset, rapid decline in its course and high mortality.[5]

Various causes of small bowel perforation include; Bacterial infection (Salmonella and tuberculosis), and Chron’s, Trauma (both blunt and penetrating), viral (Cytomegalovirus), Fungal infection (Histoplasma), Parasitic (A. Lumbricoides, E vermicularis), Drugs (NSAIDS, Steroids) and Lymphoma.[6] In a significant number of cases, the cause of perforation is not known. Perforation causes gram-negative aerobic and anaerobic infection leading to peritonitis.[7]

For diagnosis, various modalities like erect X-ray abdomen, serum amylase, peritoneal tapping are performed. However, not much of the time should not be devoted to diagnosing the case, and laparotomy is the ultimate diagnostic procedure. So early operative procedures are beneficial to the patient.[8]

Various surgical procedures advocated by different authors include simple perforation closure, Resection and anastomosis, Ileostomy, Graham’s Patch Repair. Even with such a variety of procedures, small bowel perforation still has a high morbidity and mortality rate.[9]

Aims and Objectives

- To study the various causes, incidences and clinical features of small bowel perforations.
- To study the various surgical procedures and it’s the outcome.
- To study the morbidity and mortality pattern of patients having small bowel perforations.

Materials

All the patients of small bowel perforation of both sexes and of different ages, who were admitted to the Department of General Surgery of M.K.C.G. Medical College and hospital, Berhampur, Ganjam, Odisha during the period between July 2018 to June 2020 (including 6 months of follow up period) were included in this study.

Study design

Prospective observational study

- All patients were selected according to the inclusion and exclusion criteria in different categories.
- The protocol was reviewed and approved by the ethics committees of this institution. Patients were included after taking their informed consent for the study.

Source of data

All, the indoor patients of small bowel perforation.

Place of study

Postgraduate Department of M.K.C.G Medical College and Hospital, Berhampur. This study encompasses patients from all the parts of Southern Odisha, and neighbouring states referred to this hospital for proper treatment.

Ethical clearance

The present study was approved by the institutional Ethical Committee (I.E.C. NO. -710) of M.K.C.G Medical College and Hospital, Berhampur, on human subject research.

Study period

July 2018 – June 2020.

Inclusion criteria

Patients admitted with a diagnosis of small bowel perforation. Both male and female above 15 years of age.

Exclusion criteria

Patients with extreme age [>65 yrs] and less than 15 years of age. Patients with advanced cancer. Patients who are not fit for surgery.

Methods

A detailed history, particularly name, age of the patients, religion, socioeconomic status and chief complaints in chronological order with duration and progresses, personal history, marital status and family history were taken. In addition, significant history and drug history was taken.

Importance was given to symptoms, mode of onset of symptoms, duration of symptoms, association with pain, history of trauma.

Management

All the patients were undergone surgical management. Furthermore, the surgical management constituted explorative laparotomy.

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Histopathological Examination

Wherever available, the resected specimen was sent for histopathological study. The preoperative results were analyzed with the histopathological study of the resected specimen wherever available, and a conclusion was derived.

Observation

- The youngest patient in this study was 15 years old, and the oldest was 65 years of age. The mean age of presentation was found to be 35.76 years. The disease is more prevalent in patients above 26 and below 45 age group.
- In this study, a total, no of 41 male patients (78.84%) and 11 female patients (21.16%) had a male to female ratio of 3.72. The high percentage of the male population may be due to higher incidences of risk factors.

Symptoms of small bowel perforation

- The common presenting symptoms of this study was pain abdomen, distension(100%).
- Vomiting presented in 44.23% of cases, followed by fever (36.5%) and constipation (32.7%).

Signs

- Abdominal tenderness was present in all the cases.
- In 48 patients(92.3%), the bowel sound was absent
- Muscle guarding and rigidity were present in 47 patients(90.3%), and in 41 patients (78.9%), obliteration of liver dullness was elicited.

Investigations

- Routine investigations were carried out in all the cases preoperatively.
- The special diagnostic investigations were done like straight X-ray abdomen. As a result, free gas under the diaphragm was identified in 41 cases (79%), and in the USG abdomen, free fluid was found in 46 cases (88.5%).
- In 19 patients (36.5%), the Hb% were less than 10gm, and in 33 patients (63.5%), it was more than that.
- The total leucocyte count was normal or decreased in 9 patients (17.3%) and increased in 43 patients(82.7%).
- In 12 patients(23%), there was hypokalemia, and in 17 patients(34%), there was hyponatremia.

Inference

- The serum urea was increased in 14 patients(27%), and creatinine was increased in 11 patients(21%).

After the patients were admitted to an emergency, the preoperative resuscitation was taken up, and subsequently, they were subjected to laparotomy. The duration of resuscitation or preoperative treatment with the above methods was variable depending upon the general conditions of the patient and response to treatment. However, this resuscitation is essential because.

- The patient must be prepared to tolerate anaesthesia.
- Tolerate the surgical shock.
- Limit the spread of infection and toxaemia.
- Post-operative recovery must be good.

With this aim, the duration of conservative management was as follows.

- Only 7 patients (13.5%) underwent laparotomy within 6 hrs of management.
- Within 6-11 hrs, 11 patients(21.15%) underwent laparotomy, and 29 patients (55.75%) were operated on within 12-24 hrs of conservative management.
- Lastly, only 5 patients (9.6%) were operated on after 24 hrs of management.

Inference

- In this study, free peritoneal fluid was found in 46 cases (88.5%). Free gas in the peritoneal cavity was found in 41 cases (79%) due to third space fluid collection and escape of bowel gas into the peritoneum, respectively.
Table 1 Associated Operative findings

| Operative findings                | No. of Cases | Percentage |
|----------------------------------|--------------|------------|
| Free fluid in the peritoneum     | 46           | 88.5       |
| Free gas in the peritoneum       | 41           | 79         |
| Mesenteric lymphadenitis          | 2            | 3.85       |
| Thickened omentum                | 2            | 3.85       |

Table 2 Causes of Perforation

| Name of the diseases          | No of cases | Percentage |
|-------------------------------|-------------|------------|
| Duodenal ulcer                | 36          | 69.25      |
| Traumatic                     | 10          | 19.25      |
| Tuberculosis                  | 2           | 3.85       |
| Typhoid                       | 1           | 1.9        |
| Crohn’s disease               | 1           | 1.9        |
| Malignancy                    | 2           | 3.85       |
| Total                         | 52          | 100        |

Table 3 Different Surgical Procedures

| Name of operation                  | No. of Cases | Percentage |
|------------------------------------|--------------|------------|
| Only toilet and closure of perforation | 42          | 80.77      |
| Resection and anastomosis          | 7            | 13.47      |
| Only drainage                      | 2            | 3.84       |
| Ileostomy                          | 1            | 1.92       |
| Total                              | 100          | 100        |
Mesenteric lymphadenitis and thickened omentum were found in 2 cases (3.85%) due to tuberculosis and malignancy.

On exploration of the cases, we could identify the site of perforation. In 39 cases (75%) there were duodenal perforation, in 3 cases (5.75%) jejunal perforation and in 8 cases (15.4%) ileal perforation were found.

In 2 cases (3.85%) multiple perforations found.

**Inference**

From the history, clinical examination investigation and operative findings, the aetiology of perforation could be diagnosed in the naked eye examination at the time of operations.

In this study, 36 cases (69.25%) of perforation were due to peptic ulcers. Next order cases due to trauma consist of 10 cases (19.25%).

Tubercular perforation was seen in 2 patients (3.85%), and due to Crohn’s disease, only 1 case was found. Typhoid perforation was seen in 1 case. Malignant perforation was seen in 2 cases (3.85%) which were found to be gastrointestinal stromal tumours after histopathological examination.

**Clinical and histopathological diagnosis**

- The clinical diagnosis of typhoid in 1 case and malignancy in 2 cases concur with the histopathological study.
- The diagnosis was Crohn’s disease in only one case, while 2 cases were confirmed as tuberculosis from histopathology.
- So out of 52 cases, 6 cases had settled histopathological diagnosis.

**Inference**

In this present study maximum number of operations performed was toileting and simple closure of the perforation in 42 cases (80.77%), followed by resection and anastomosis in 7 cases (13.47%).

In only 2 cases (3.84%), only drainage by abdominal drain was done as the perforation was sealed, and ileostomy was done in 1 case (1.92%).

**Inference**

In the study, it is seen that all the 34 duodenal perforation simple closure was done. In only 2 cases, only drainage by abdominal drain was done as the perforation was sealed.

In the 10 traumatic cases, 8 cases underwent simple closure, and 2 cases of resection and anastomosis were done as there were multiple perforations.

The only typhoid case underwent ileostomy.

Moreover, all other resections and anastomosis were done.

**Inference**

Though the proper preoperative and post-operative care has been taken, the study shows several cases developed postoperative complications.
Table 4 Operative Procedures according to diagnosis

| Diagnosis       | No of Cases | Simple closure | Resection and anastomosis | Only drainage | Ileostomy |
|-----------------|-------------|----------------|---------------------------|---------------|-----------|
| Duodenal ulcer  | 36          | 34             | -                         | 2             | -         |
| Traumatic       | 10          | 8              | 2                         | -             | -         |
| Typhoid         | 1           | -              | -                         | -             | 1         |
| Tuberculosis    | 2           | -              | 2                         | -             | -         |
| Malignancy      | 2           | -              | 2                         | -             | -         |
| Crohn’s diseases| 1           | -              | 1                         | -             | -         |
| Total           | 52          | 42             | 7                         | 2             | 1         |

Table 5 Post-operative Morbidity

| Diagnosis       | No of cases | Burst abdomen | Fecal fistula | Wound sepsis | Death |
|-----------------|-------------|---------------|---------------|--------------|-------|
| Duodenal ulcer  | 36          | 1             | -             | 8            | 3     |
| Traumatic       | 10          | 1             | -             | 2            | 1     |
| Malignancy      | 2           | -             | 1             | 1            | 1     |
| Typhoid         | 1           | -             | -             | -            | -     |
| Tuberculosis    | 2           | -             | -             | 1            | 1     |
| Crohn’s disease | 1           | -             | -             | -            | -     |
| Total           | 52          | 2             | 1             | 12           | 6     |

Inference

- The study shows that 28 of the cases recovered in <12 days period, and 3 died in this period.
- In > 12 days period, 18 cases recovered, and 3 died.
- In this study, 52 cases of small bowel perforation due to different causes total, 6 died, showing a death rate of 11.6%.

Discussions

Age of distribution

In the present study of 52 patients, the youngest person has age 15 years, and the oldest person has age 65 years. In the 15-25 years age group, there were 13.46% patients. There were 30.77% of patients in the age group 26-35. In the age group, 36-45 total cases were 40.34%. In the age group, 46-55 total 5 patients were there, constituting 9.5%. In the 56-65 age group total of 5.77% of patients were there. It was found that the mean age of presentation is 35.76. The study conducted by Nahar et al., Jhobta et al. and Seth et al., the total number of patients are 90, 504 and 33, respectively, and the mean age of presentation was 34.37, 36.8 and 34.39, which is similar to the present study. [10,11,12]

Gender distribution

In the study population of 52 patients, it was found that the incidence of a male presenting to the Emergency department with features suggestive of small bowel perforation was 78.84%, and the incidence of females was only 21.16%. The male to female ratio was found to be 3.72:1. This suggests that small bowel perforation is more prevalent in the male gender in the Southern Part of Odisha. Nahar et al. studied 90 patients, and the male cases were 81%, and 19% were female cases. The M:F ratio was 4.26:1. [10] In the study conducted by Jhobta R S et al., 84% were male, and 16% were female, having an M: F ratio of 5.25:1, which is comparable to the present study. [11] In the study conducted by Bhanuprakash K R et al., the male patients were 90%, the remaining 10% were females, and the M: F ratio was 9:1.
Table 6 Moratility

| Duration of hospital stay | No of cases recovered | Percentage | No of cases died | Percentage |
|--------------------------|-----------------------|------------|-----------------|------------|
| <12 days                 | 28                    | 53.8       | 3               | 5.8        |
| >12 days                 | 18                    | 34.6       | 3               | 5.8        |
| Total                    | 46                    | 88.4       | 6               | 11.6       |

Table 7 Comparision of Mean age of presentation with other studies

| Mean age in years | Nahar S et al.[10] | Jhobta R S et al.[11] | Seth S et al.[12] | Present study |
|-------------------|---------------------|-----------------------|-------------------|---------------|
|                   | 34.37               | 36.8                  | 34.39             | 35.76         |
| Total cases       | 90                  | 504                   | 33                | 52            |

In this study male population was more as most of the patients belong to low socioeconomics strata, and 95% of them were the sole working member of the family. [13]

**Symptoms of small bowel perforation**

In the study conducted by Nahar et al., Seth et al., and Bhanuprakash et al., pain abdomen were present in all the cases,[10,12,13] Similarly, pain abdomen was also present in all 52 cases in the present study. Abdominal distension was present in the study conducted by Nahar et al., Seth et al. and Bhanuprakash et al. 94.44%, 100% and 74%, respectively.[10,12,13] In the present study, abdominal distension was present in 100% of the cases. Nahar et al., Seth et al., and Bhanuprakash et al. found vomiting was present in 38.88%, 15.1% and 60%, respectively.[10,12,13] However, vomiting was seen in 44.23% of the cases in the current study. The difference is due to the time elapsed before the patient to the hospital. Constipation was present in the study of Nahar et al., Seth et al. and Bhanuprakash et al. 33.33%, 84.4% and 22% of the cases, respectively.[10,12,13] In the present study, it is found to be in 32.7% of the cases, which is almost half the cases of Seth et al. as in their study, most of the cases were presented delayed to the hospital.[12] Nahar et al., Seth et al., and Bhanuprakash et al. recorded fever in 33.33%, 30.3%, and 41% of the cases, which is similar to the present study’s findings, which is 36.5% of the cases.[10,12,13]

**Signs of small bowel perforation**

In the study conducted by Nahar et al. and Bhanuprakash et al., abdominal tenderness was present in 100% of the cases, which is the same as the present findings of the study.[10,13] Muscle guarding was present in the study conducted by Nahar et al. and Bhanuprakash et al. 82.22% and 93% of the cases, respectively, which is similar to the present study.[10,13] Rigidity was present in the study conducted by Nahar et al. and Bhanuprakash et al., 82.22% and 85% cases, respectively, which is similar to the present study.[10,13] In the study conducted by Nahar et al. and Bhanuprakash et al., Absent bowel sounds were present in 86.66% and 86% of the cases, which are similar to this study which is 92.3% of the cases.[10,13] Obliteration of liver dullness was present in the study conducted by Nahar et al. and Bhanuprakash et al. 61.66% and 68%, respectively, which is also similar to the findings of this present study which is 78.9% of all the cases.[10,13]

**Investigations**

In the study conducted by Jhobta et al. and Seth et al., Hypoponatraemia was present in 29% and 21.2% of the cases, which is similar to the present study, 34% of the cases.[11,12] Jhobta et al. found that 9% of the cases were having hypokalaemia, whereas, in this study, 23% of the patients were having the same, which is due to in the latter cases the electrolyte imbalance being more.[11] Seth et al. found hypokalaemia in 21.2% of the cases, similar to the present study, which is 23%.[12] In the study conducted by Jhobta et al., they found serum urea was increased in 15% of the patients, whereas in this present study, it is found to be in 27% of the patients as in this study, more cases were with dehydration.[11] However, in the study of Jhobta et al. and Seth et al., serum creatinine was raised in 13% and 15.1% of the patients, respectively, similar to the present study.[11,12] Pneumoperitoneum in x-ray was found in the study conducted by Nahar et al., Jhobta et al., and Seth et al. as 61.11%, 67% and 51.5%, respectively, and the cases with pneumoperitoneum is on the higher side in this present study as 79% of the cases.[10,11,12] In the study conducted by Nahar et al. and Seth et al., free fluid in the peritoneal cavity was found in 77.77% and 69.6% of the cases, similar to this present study.[10,12]

**Duration of conservative management**

In the study conducted by Jhobta et al. and Seth et al., the duration of conservative management were <12hrs for the 79% and 100% of all cases, respectively and in this present study, it is 34.65% of cases for the first 12 hours as in the later cases more number of patients were not haemodynamically stable.[11,12] Jhobta et al. found that 21% of the cases were managed conservatively, but in this current study, 65.35% of cases were managed for >12 hours.[11]

**Site of perforation**

On exploration of the cases, we could identify the perforation site in 75% of cases, there was a duodenal perforation, in 5.75% cases jejunal perforation, and in 15.4% cases, ileal perforation was found.

In the study conducted by Nahar et al., Seth et al., and Bhanuprakash et al., the duodenal perforation was 56.66%, 70% and 70%, and the ileal perforation were 33.33%, 21% and 23%, respectively.[10,12,13] In this present study, there were more duodenal perforations than ileal perforation as more duodenal
Table 8: Comparison of Site of perforation with other studies

|                | Nahar S et al[10] | Seth S et al[12] | Bhanuprakash K R et al[13] | Present study |
|----------------|------------------|------------------|---------------------------|--------------|
| Duodenum       | 56.66%           | 70%              | 70%                       | 75%          |
| Ileum          | 33.34%           | 21%              | 23%                       | 15.4%        |
| Jejunum        | 10%              | 9%               | 7%                        | 5.75%        |

Table 9: Comparison of Cause of perforation with other studies

|                | Nahar S et al[10] | Seth S et al[12] | Present study |
|----------------|------------------|------------------|--------------|
| Duodenal ulcer | 54.44%           | 63.63%           | 69.25%       |
| Traumatic      | 10%              | 6.06%            | 19.25%       |
| Tuberculosis   | 6.66%            | 9.09%            | 3.85%        |
| Typhoid        | 26.66%           | 15.15%           | 1.9%         |
| Crohn's disease| 1.11%            | -                | 1.9%         |
| Malignancy     | 1.11%            | 6.06%            | 3.85%        |

ulcer cases than typhoid cases. Nahar et al., Seth et al., and Bhanuprakash et al. found jejunal perforation 10%, 9%, and 7%, respectively, which is 5.75% in the present study.[10,12,13]

Cause of perforation

In the study conducted by Nahar et al. and Seth et al., the duodenal ulcer was present in 54.44% and 63.63% of cases, similar to the present study, which is 69.25% of all the cases.[10,12] As far as the traumatic perforations are concerned, Nahar et al. and Seth et al. found 10% and 6.06% cases in their study contrary to the present study, which is 19.25% as the road traffic accidents are more in nowadays.[10,12] Nahar et al. and Seth et al. found tuberculosis of small bowel 6.66% and 9.09% in their study, and typhoid of ileum was found to be 26.66% and 15.15%, which is again very less in the present study as the infectivity is being decreased.[10,12] In the study conducted by Nahar Crohn’s, the disease was present in 1.11% of the cases, whereas, in the present study, it is present in 1.9% of the cases, which is similar to the former.[10] Nahar et al. and Seth et al. found the small bowel malignancy were 1.11 and 6.06% of the cases, respectively. The present study is 3.85%, as the malignancy risk factors are implicated differently in different study groups.[10,12]

Operative procedures

In the study conducted by Seth et al., Bhanuprakash et al. and Jain et al., only toilet and closure of the perforation was done in 63.63%, 87% and 44.2% of the cases, respectively.[12,13,14] However, in the present study, peritoneal toileting and closure did in 80.77% of the cases, which is almost twice the number of cases done by Jain et al. because the number of duodenal perforation was less in their case.[14] So far, resection and anastomosis are concerned with Seth et al., Bhanuprakash et al. and Jain et al. 12.12%, 5% and 19.3% of the cases.[12,13,14] However, in the present study, it was done in 13.47% of the patients, which is near twice the study of Bhanuprakash et al. In their cases, there was more number duodenal perforation.[13] Bhanuprakash et al. had done only drainage in sealed perforations which was 2% of the cases, and in the present study, it was found to be 3.84% which is similar.[13] In the study conducted by Seth et al. and Jain et al., an ileostomy was done in 15.15% and 25.5% of the cases. However, the present study was done only in 1.92% of cases as the number of typhoid perforations in both the studies was higher than in the present study.[12,14]

Postoperative morbidity

Though proper preoperative and post-operative care has been taken, the study shows several cases developed postoperative complications. Burst abdomen was present in 7% of the cases in Bhanuprakash et al. and 3.84% in the present study due to better abdominal muscle closure.[13] In the study conducted by Nahar et al., Bhanuprakash et al. and Jain et al., the faecal fistula was found in 4.44%, 7% and 11.5%, respectively, which is more than the present study.[10,13,14] However, as far as wound sepsis is concerned, Nahar et al., Bhanuprakash et al. and Jain et al. found 8.88%, 25% and 46.8% of the cases. The present study found to be 23.07% as the control of infectivity and wound care is different in different studies.[10,13,14]

Mortality

In this study, 3 patients died in 6-8 days period. In 9-12 days, 2 cases have died. In more than 14 days period only 1 case died. In the study conducted by Nahar et al., Seth et al. and Bhanuprakash et al., the mortality was 5.55%, 6.06% and 15%, respectively.[10,12,13] However, in the present study, the mortality rate was 11.54% which is governed by various factors such as duration of presentation, haemodynamic status and stage of peritonitis.

Conclusion

The following conclusions were drawn from the study:

- Duodenal ulcer perforation was the most common cause of perforation in small intestinal perforation.
• The highest number of patients was seen in the age group 26-45 years, irrespective of the pathological conditions. Perforation was more common in males than females. 73% male & 27% female.
• Majorities of patients belonged to rural areas with poor socioeconomic status and were unskilled workers.
• Smoking and the use of non-steroidal anti-inflammatory drugs are important risk factors for peptic ulcer perforation. Most of the patients presented within 24-48 hrs of the clinical symptoms. However, delayed hospitalization shows high morbidity & mortality.
• The presence of gas under the diaphragm confirms the diagnosis, but their absence does not exclude the diagnosis.
• Sudden onset of abdomen pain was a constant symptom. Vomiting and nausea were also seen. Tenderness, rigidity & guarding are important signs. The absence of bowel sounds is one of the early signs of perforation peritonitis.
• Resuscitation & preoperative management of the patient is as important as the surgical procedure. Risk factors for operation of perforation were old age, duration of perforation, size of perforation & presence of preoperative shock.
• Laparotomy with the perforation closure and omental patch closure is the commonest method of surgical management in perforative peritonitis.

Ethical Committee Approval
The present study was approved by the institutional Ethical Committee (I.E.C. NO. 710) of M.K.C.G Medical College and Hospital, Berhampur on human subject research.

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Conflict of interest
There are no conflicts of interest to declare by any of the authors of this study.

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