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**Original Research Article**

# Peritonitis secondary to non-traumatic small and large bowel perforation

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## ABSTRACT

**Background:** The objective of the study was to determine the outcome of secondary peritonitis in non-traumatic small and large bowel perforation in a secondary care hospital in the region of Ha'il, Kingdom of Saudi Arabia (KSA).
**Methods:** This prospective study was conducted in a surgical unit of King Khalid Hospital, Ha'il Kingdom of Saudi Arabia, from 01 October 2013 to 30th June 2014. 30 patients were admitted through emergency room (ER). Every patient was enquired a detailed history about abdominal distension, abdominal pain, fever, constipation, vomiting, and gut motility. Clinical examination of the patient was done. Baseline investigations along with chest radiograph posterio-anterior (PA) view, abdominal radiograph with erect and supine views and ultrasound whole abdomen were included. All patients landed in the ER with peritonitis due to gastrointestinal perforation, regardless of their sex and age, were included. Peritonitis of primary cause or due to trauma, corrosive ingestion and anastomosis leak were excluded. Follow up of all the patients was done. Data was analyzed through SPSS software 16.
**Results:** Out of 30 patients, 23 (76.66%) were male and 7 (23.33%) were female. Mean age 36.28±2.3 years. 80% presented with abdominal pain. Pneumoperitoneum on chest X-Ray was found in 21 (70%) patients. Duodenal perforation was the most common reason of peritonitis in 14 patients (46.66%). Surgical site wound infection is the commonest complication in 16 patients (53.33%).
**Conclusions:** In conclusion, the outcome of secondary peritonitis in our Eastern population is perforation of the upper gastrointestinal tract and small bowel as the documented common cause, and wound infection as the commonest complication.

**Keywords:** Peritonitis, Perforation, Small bowel, Large bowel, Wound infection

## INTRODUCTION

Dealing with emergencies, surgeons come across cases of peritonitis involving gastrointestinal tract.[1] Different regions of gastrointestinal tract in which perforation is detected, behaves differently in Eastern and Western populations.[2]

Peritonitis may be classified as primary when there is disruption of abdominal viscera, or secondary which includes localized abscess and tertiary, which is caused by disturbed immune response and occurs late. Treating medically with drugs is the first line defense in cases of either primary or tertiary peritonitis while the role of

surgeons comes into play in cases of secondary peritonitis.[4,5] Peritonitis remains a debatable subject even after developments in surgery and intensive care techniques and treatments. To achieve better survival rates, efforts are being taken to fight the pathophysiology of this lethal condition.[6,7] Despite recent advances in surgical technology and investigations, mortality is seen in one-third of the patients of surgical peritonitis.[8,9] Prompt diagnosis, rehydration, proper surgical management, appropriate intravenous antibiotics and thorough peritoneal washout per operatively are the hallmarks for achieving reduced mortality and morbidity rates.[11,12]

## METHODS

This study was conducted from 01 October 2013 to 30 June 2014, in surgical unit, King Khalid Hospital, Kingdom of Saudi Arabia in Hail region and consisted of 30 patients admitted through casualty department. All data were entered in a specified proforma designed for this purpose.

Comprehensive history was given by every patient with regards to abdominal distension, generalized abdominal pain, fever, constipation, vomiting, dehydration, abdominal rigidity and gut motility. Detailed clinical examination was also done in every patient. Baseline laboratory investigations along with chest radiograph (PA View), abdominal radiograph (erect and supine) and ultrasound whole abdomen were done.

Patients having counselled for the study and written consent done were included in this study regardless of their age and sex. Patients landing in ER with trauma, corrosive ingestion and those with either primary or tertiary cause of peritonitis were excluded from the study.

Follow up visits were called one-week post discharge from the hospital. Phone contact number was also taken in case of lost to follow up visits or any other complication encountered. Data was analyzed through SPSS software version 16.0.

## RESULTS

Amongst 30 patients, males were 23 (76.66%) and females were 7 (23.33%); with a male to female ratio of 3.2:1 (Figure 1). Age range was 20 to 65 years. The mean age was 36.28±2.3 years (Table 1). Patients presented with pain in abdomen were 80% followed by abdominal distention and vomiting. Urine output (<30 ml/hr) in 3 (10%) with deranged vitals was also found (Table 2).

### *Investigations*

Pneumoperitoneum was found in 21 (70%) chest radiographs and air fluid level in 27 (90%) abdominal radiographs. Deranged profile of urea, creatinine and electrolytes was also found (Table 3).

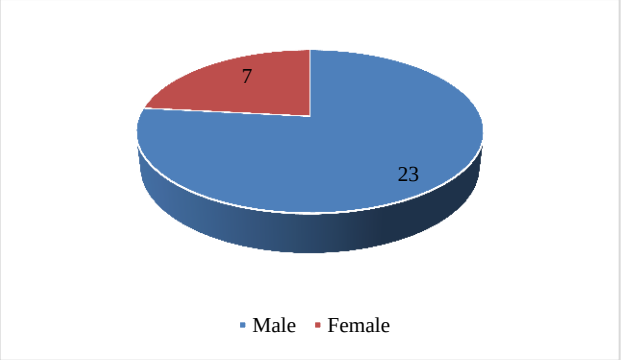


**Figure 1: Sex distribution.**

**Table 1: Age pattern.**

| Age in years | No. of patients (n=30) | % |
|---|---|---|
| **20-35** | 15 | 50 |
| **36-50** | 8 | 26.6 |
| **51-65** | 7 | 23.33 |

Means age: 36.28±2.3 years.

**Table 2: Signs and symptoms of patients.**

| Signs and symptoms | No. of patients (n=30) | % |
|---|---|---|
| **Abdominal pain** | 24 | 80 |
| **Abdominal distention** | 16 | 53.33 |
| **Altered bowel habit** | 8 | 26.66 |
| **Nausea vomiting** | 7 | 23.33 |
| **Constipation** | 8 | 26.66 |
| **Fever** | 6 | 20 |
| **Increased heart rate (pulse >110/minute)** | 5 | 16.66 |
| **Systolic blood pressure <100 mm Hg** | 3 | 10 |
| **Urine output (<30 ml/hr)** | 3 | 10 |
| **respiratory rate >20/minute** | 4 | 13.33 |
| **Septicemia** | 6 | 20 |

**Table 3: Positive findings on investigations.**

| Characteristic | No. of patients (n=30) | % |
|---|---|---|
| **Pneumoperitoneum on chest radiograph** | 21 | 70 |
| **Air fluid levels on abdominal radiograph** | 27 | 90 |
| **Potassium levels less than 2.7 mEq/l** | 18 | 60 |
| **Hyponatraemia(Na<130 mEq/l)** | 15 | 50 |
| **Raised blood urea and creatinine** | 10 | 33.33 |

***Site of perforation***

Commonest site of perforation was duodenum in 14 (46.66%) patients, followed by ileum. Rectum was the least observed site of perforation (Table 4).

**Table 4: Region of perforation.**

| Region of perforation | No. of patients (n=30) | Percentage (%) |
|---|---|---|
| **Duodenum** | 14 | 46.66 |
| **Jejunum** | 8 | 26.66 |
| **Stomach** | 1 | 3.33 |
| **Colon** | 3 | 10 |
| **Appendix** | 2 | 6.66 |
| **Caecum** | 1 | 3.33 |
| **Rectum** | 1 | 3.33 |

***Post-operative complications***

Wound infection was the most common postoperative complication found. Atelectasis in 4 (13.33%) patients. 2 patients developed abdominal collection while 2 were reopened for anastomotic leak (Table 5).

**Table 5: Postsurgical complications.**

| Complications | Number of patients (n=30) | Percentage (%) |
|---|---|---|
| **Wound infection** | 16 | 53.33 |
| **Wound dehiscence** | 8 | 26.66 |
| **Atelectasis** | 4 | 13.33 |
| **Septicemia** | 3 | 10 |
| **Abdominal collection** | 2 | 6.66 |
| **Anastomosis leak** | 2 | 6.66 |
| **Mortality** | 1 | 3.33 |

## DISCUSSION

Perforations in gastrointestinal tract leading to perforation, naturally produces morbidity and a catastrophic mortality if left untreated.[14] Resuscitation phase is very crucial in peritonitis cases, that can buy time for preliminary investigation and empirical treatment. Usually the anatomy and types of pathological organisms guides the localization of peritonitis.[15] However, in severe cases of peritonitis with diffuse spread of peritoneal contamination, it is caused by disruption of anatomy, patient related factors of age and immunodeficiency, or perforation proximal to obstruction etc.[16] Presentation of different peritonitis also differs, like duodenal perforation with a short history and generalized abdominal tenderness, while those with diverticulitis also have signs related to previous history, while appendicitis has usually a clear-cut history of right iliac fossa tenderness. Ileal perforations are usually preceded by medical history.[17-19]

A predominance of male patients was found in our study. Study of Malik also reported males (60.86%) as predominant.[20]

The age range was 20 to 65 years as in study by Singh.[21] The study of Jhobta reported the abdominal distention in 68%, vomiting in 60%, constipation in 41% cases, similarly we observed abdominal pain followed by abdominal distention and vomiting.[22]

Gas under diaphragm (pneumoperitoneum) was reported in 90% of cases when chest x-ray (postero-anterior view) was done, similarly as we reported in our study.[23]

Perforations of the stomach, duodenum and small bowel due to disease states are more common in Eastern population, as compared to western population with large bowel is the common site of perforation.[24,25] Duodenum was the most common region of gut involved having perforation in our study followed by ileum, jejunum and appendix.

In our study common complications were wound infection followed by wound dehiscence, abdominal collection and anastomosis leak, which also corresponds to a study.[13]

## CONCLUSION

To conclude, peritonitis due to duodenal and ileal perforation is the common presentation, which is followed by other gastrointestinal tract regions in our Eastern population. This trend differs from the population in Western countries which might be due to the different disease states which they present. However and hence the expected complications and sequalae of peritonitis post-surgery is wound infection and dehiscence, the manner in which the patients present. The awareness among the people is still required in our society to have treated these illnesses prior they get into the busy business of morbidity and mortality.

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