Original Research Paper

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General Surgery

EVALUATION OF THE ANATOMICAL SITE OF HOLLOW VISCUS PERFORATION PERITONITIS AND THEIR MICROBIOLOGICAL PROFILE.

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ABSTRACT Acute generalised peritonitis following hollow viscus perforation is a common surgical emergency worldwide and a major cause of non-traumatic deaths in the emergency ward[1]. Peritonitis is often caused by introduction of pathogens and chemical irritants into the sterile peritoneal cavity through perforated bowel[2]. A study was performed at Silchar Medical College and Hospital under the Dept of General Surgery over a period of 7 months on 30 patients who presented with hollow viscus perforation peritonitis (both traumatic and spontaneous), their site of perforations were identified and recorded, peritoneal fluids were sent for culture and antibiotic sensitivity studies. This study was performed with reference to similar studies conducted in the country and abroad.[3]

KEYWORDS :

INTRODUCTION

- On the basis of source and nature of the microbial contamination, peritonitis can be classified as primary, secondary and tertiary. Primary peritonitis is often monomicrobial, of the peritoneal fluid without visceral perforation. Secondary peritonitis arises from subsequent loss of integrity of a hollow viscous and is the most common form of peritonitis encountered. Tertiary peritonitis is either due to failure of the host inflammatory response or due to superinfection. The contamination of the peritoneal cavity thus can lead to a cascade of infection, sepsis, multi organ failure and death if not treated in a timely manner.[4]
- Peritonitis due to hollow viscous perforation is commonly encountered in surgical practice and it is defined as inflammation of the serosal membrane that lines the abdominal cavity and the organs contained therein. Peritonitis is often caused by introduction into the otherwise sterile peritoneal cavity through perforation of the bowel and introduction of a chemically irritating material such as gastric acid from a perforated ulcer[5]
- The antibiotic treatment of intra-abdominal infection has evolved for the past 30 years and is based on solid experimental and class 1 clinical data. In fact, the earliest experiment done by Weinstein et al showed that a combined therapy targeted towards both aerobic and anaerobic organisms was regarded as correct regarding survival and helped minimize abscess formation. Current therapy towards the treatment of peritonitis is directed at correction of the underlying cause, administration of systemic antibiotics and facilitating supportive therapy to prevent formation of SIRS.[8]
- The treatment can be done easily by starting a certain line of antibiotic therapy these usually include a broad-spectrum antibiotic that covers gram-positive, gram-negative and anaerobes. However, the problem now is the development of resistance to these antibiotics and results in high failure rates in the treatment.[6]
- In this study, various organisms growing in the peritoneal fluid culture of the patient presenting with perforation peritonitis and their antibiotic sensitivity and resistance pattern were analyzed, so that we can initiate early and appropriate antibiotic therapy to patients presenting hollow viscus perforation peritonitis preoperatively which can improve the outcome of the patient[7]

AIM:

The aim of this study is to evaluate the microbiological distribution and their sensitivity profile according to the anatomical site of perforation, as identified from peritoneal fluid cultures in patients of hollow viscus perforation peritonitis.

OBJECTIVES:

1. To find the common anatomical site of perforation.
2. To determine the bacterial profile of the peritoneal fluid and its culture and antibiotic sensitivity.

Source Of Data

Patients who attended the Department of General Surgery, Silchar Medical College and Hospital who were diagnosed with Hollow Viscus Perforation peritonitis from 1st April 2023 to 31st October 2023 i.e. over 7 months were included.

MATERIALS AND METHODS

Study Design

A cross-sectional study in a tertiary health care center in Silchar, Assam.

Study Setting

Department of General Surgery, Silchar Medical College and Hospital.

Study Period

The study was carried out for 7 months i.e. from 1st April 2023 to 31st October 2023.

Study Population

Patients who attended the OPD/IPD and emergency ward in the Department of General Surgery, Silchar Medical College and Hospital and were diagnosed with Hollow Viscus Perforation peritonitis.

Sample Size: 30

Inclusion Criteria:

Patients presenting with features of hollow viscus perforation peritonitis and confirmed by X-ray abdomen and USG whole abdomen.

Exclusion Criteria:

- Patients who denied participation for this study.
- Patients who refused to undergo surgery for the condition.

Data Collection

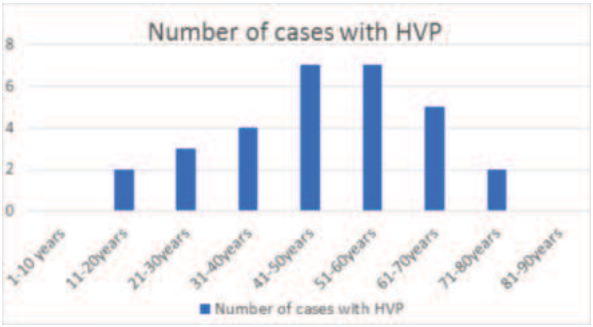
Data pertaining to the following variables were collected – age, sex, diagnostic tests, anatomical site of perforation, peritoneal fluid culture and antibiotic sensitivity study.

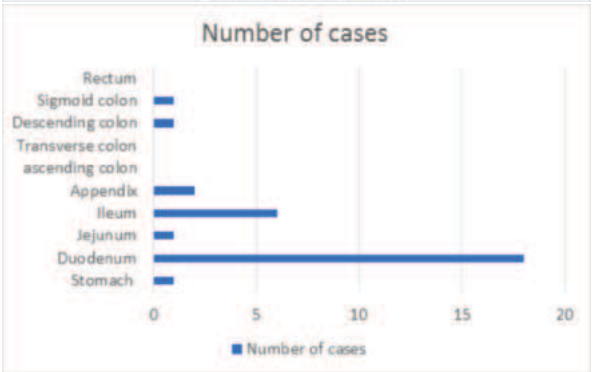
Definitions

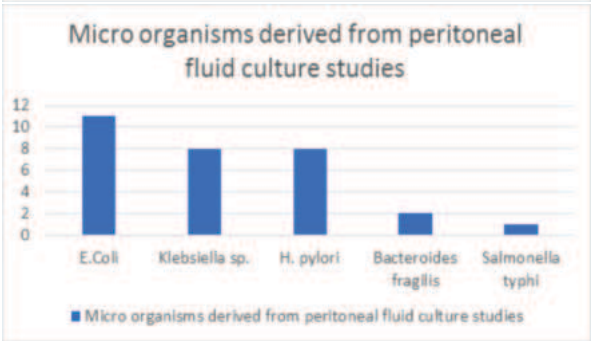
- Hollow viscus perforation is defined as loss of gastrointestinal wall integrity with subsequent leakage of enteric contents.[8]
- Peritonitis is defined as inflammation of the peritoneum with accumulation of fluid in the peritoneal space caused by pathogen either via blood or after rupture of an abdominal organ.[8]

- Culture study and antibiotic study could be defined as growing the microorganism obtained from a sample in its respective media to confirm the causative organism and antibiotic study is assessing its sensitivity to a spectrum of antibiotics and identifying the most effective antibiotic agent as per the organism.[8]

RESULTS







CALCULATIONS

Using expected frequencies, individual Chi squares, degree of freedom and two tailed P value.

Involved segment	Individual Chi^2
Stomach	3.2
Duodenum	33.8
Jejunum	3.2
Ileum	0.2
Appendix	1.8
Colon	1.8

Degree of freedom – 5
Expected frequency – 5
Two tailed **P value - <0.0001** (graphpad.com)

Using expected frequencies, individual Chi squares, degree of freedom and two tailed P value.

MICROORGANISM	INDIVIDUAL CHI^2
E.Coli	4.16
Klebsiella sp.	0.6
H. Pylori	0.6
Bacteroides fragilis	2.6
Salmonella typhi	4.16

- Degree of freedom – 4
- Expected frequency – 6
- Two tailed **P value – 0.015**(graphpad.com)

RESULTS

- Duodenum(60%) was the most common site of perforation followed by ileal perforation and the highest number of patients were seen in the group of 41-60(46.6%) years of age.
- Most of the patients presented within 48 hours (86.6%) of onset of pain.
- Laparotomy with closure of the perforation with omental patch(60%) was the commonest method of surgical repair.
- Most common organism discovered after peritoneal fluid analysis was E.coli followed by Klebsiella sp. and H. pylori.
- Highest sensitivity to antibiotics were seen with Cefoperazone – Sulbactam, Ceftriaxone, Meropenem, Metronidazole and Piperacillin-Tazobactam.

Clinical Manifestations Of Hollow Viscus Perforation Peritonitis Patients.

- The patients with spontaneous hollow viscus perforation presented with a history of sudden onset of pain which started after taking a meal with progressive distension of abdomen.
- Pain originated from the epigastric region/ right iliac fossa/ elsewhere depending on the site of perforation which progressed into generalized tenderness over the abdomen. There was initially colicky pain which further aggravated into constant burning pain.
- There was some reduction in pain once the abdominal distension started but then the pain increased and was diffuse.
- The pain was associated with regurgitant vomiting in most cases.
- There was no history of flatus or stool passage in patients once the abdominal distension started.
- Most of the patients had HYPOCRATIC FACIES – anorexic look with pinched face and cold sweat.
- Features of dehydration were prominent in the patients with sunken eyes, drawn cheeks, dry skin and reduced skin turgor.
- Patients with traumatic hollow viscus perforation presented with similar features along with a penetrating wound over the abdomen.

DISCUSSION

- The present study described 30 cases with hollow viscus perforation peritonitis with the aim to identify the site of perforation and the organism derived from the culture study of the peritoneal fluid and their antibiotic sensitivity.
- The earlier the patients presented after onset of pain, shorter was the duration of stay in the hospital.
- Incidence of spontaneous hollow viscus perforation was significantly higher than traumatic hollow viscus perforation.
- The most common site of perforation was found to be Duodenum followed by ileum and the most common age group involved was 40-60years.
- Most common organism derived from peritoneal fluid was E coli followed by Klebsiella sp. and Helicobacter pylori. And were sensitive to 3rd generation cephalosporins, metronidazole, piperacillin + tazobactam and carbapenem.
- Several studies done in the country and abroad show similar results with duodenum being the most common site of perforation overall with similar microbiota profile and antibiotic sensitivity.

CONCLUSION

- The majority of perforation peritonitis cases in this study comprises of duodenal ulcer perforation.
- The patients presented with sudden onset abdominal pain with distension and obstipation.
- The basic principles of early diagnosis, prompt resuscitation and urgent surgical interventions still form the cornerstone in management of these cases.
- Pre and post operatively the patients can be managed with 3rd generation cephalosporins and metronidazole effectively.

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