

Etiological Spectrum of Ileal Perforation on Surgical Grounds

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ABSTRACT

Objective: The aim of this study is to determine the incidence of ileal perforation on its etiological basis. **Study design:** The data is collected prospectively and the patients are selected by consecutive sampling technique. **Sample size:** 119 patients. **Place and duration:** The study is conducted at Surgical Emergency of Allied Hospital, Faisalabad from 1st June, 2017 to 1st Dec, 2017, over the period of 6 months. **Results:** Out of 119 patients, 86 are male and 33 are female with male to female ratio of 2.61. According to the results of the study, the order of etiologies of ileal perforation is as follows: Nonspecific 66 (55.5%), Traumatic 34 (28.6%), Typhoid 14 (11.8%), Intestinal Tuberculosis 3 (2.5%), and Iatrogenic 2 (1.7%). **Conclusion:** Typhoid and Tuberculous perforation are the third and fourth most common cause of ileal perforation, respectively. Ileal perforations are more common in males.

Keywords: Etiological spectrum, ileal perforation, typhoid, tuberculosis.

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Submitted for Publication: 05-06-2018

Accepted for Publication: 10-08-2018

Article Citation: Misha Anam, Abdullah Bin Saeed, Aamir Abdullah. Etiological Spectrum of Ileal Perforation on Surgical Grounds. APMC 2018;12(3):232-5.

INTRODUCTION

In 2015, WHO estimated 21 million cases and 2, 22,000 deaths due to typhoid fever per annum, worldwide.¹ According to a study in 2013, the annual mortality rate due to typhoid fever in Pakistan was 9.3 per 100, 000 population.² This rate has been decreased by 1.5% with an average decrease of 0.1% a year, since 1990.²⁻⁴ But still the mortality rate is very high in Pakistan as compared to the rest of the world.³

Typhoid fever is a potentially fatal multi-systemic illness which leads to ileal perforation in 0.8% to 18% of the cases.^{5,6} Classically, the typhoid perforation occurs in third week of course of undiagnosed hence untreated typhoid fever. This is solitary in 85% of the cases and is due to infection of peyer's patches by Salmonella Typhi, a gram-negative non-spore forming facultative anaerobic bacillus. It results in the development of longitudinal ulcers on the anti-mesenteric border of the gut within 45cm of ileocecal valve in the majority of the cases.

In Pakistan, a 2013 survey shows that 20.6 per million people die every year from tuberculosis. The annual mortality rate has decreased by 53.3% since 1990, with an average of 2.3% per year.⁷

Tuberculosis is the most common infectious disease all over the world, approximately 1/3rd of the population of the world is infected and 3 million people die each year because of this disease.⁸ The probable route of abdominal Tuberculous infection is the involvement of other organs especially lungs and transmission of MTB through blood or swallowed sputum. Depending upon the cause of infection, MTB is of 2 types primary and secondary. Primary abdominal TB is when involvement of no other organ has been documented in the past or present. Secondary abdominal TB is when MTB elsewhere in

the body (most commonly lungs) leads to abdominal involvement. In abdomen, TB may affect the gut, peritoneum and its reflections, lymph nodes and solid viscera. The most common site for intestinal TB is ileocecal area due to abundance of lymphoid tissue around this portion of gut.⁹

The histopathology of abdominal TB shows the typical caseous granuloma with central necrosis. The case presentation depends upon the type of infection whether it is hypertrophic, ulcerative or ulcero-hypertrophic.⁹ If there is hypertrophy, there will be narrowing of lumen (by the mass effect of tuberculoma or stricture formation) and patient will present with intestinal obstruction. If it is ulcerative, patient will present with peritonitis. Occasionally, it is hard to distinguish TB from other diseases like crohn's disease because of the indolent course of MTB and late presentation. The only definitive diagnosis is with histopathology of the specimen, to avoid the dilemma of clinical presentation and non-specific investigations.

Perforation is the break in the continuity of hollow viscera leading to spillage of intraluminal contents resulting in peritonitis. Peritonitis is the inflammation of peritoneum caused by bacterial contamination of peritoneal cavity. Patient may present with local signs and symptoms of abdominal pain, abdominal tenderness, guarding / rigidity, distention, diminished bowel sounds and systemic findings like fever, tachycardia, chills or rigors, sweating, restlessness, tachypnea, dehydration, oliguria, disorientation and ultimately shock.

In middle and low-income countries, GI infections are common because of unavailability, unaffordability and inconsistency in performing blood culture for diagnostic purposes. This increased incidence means that the data provided to health policy makers is insufficient to make decisions about deployment of GI infections prevention and vaccines, and the

disease burden is poorly quantified. The present research with literature review and significant results highlights the fact that GI infections especially typhoid fever and abdominal tuberculosis are still making a bulk of surgical emergencies. This data can be used for health policy formulation and implementation in future.

METHODOLOGY

Study Design: Prospective study.

Setting: Surgical Emergency of Allied Hospital, Faisalabad

Duration of Study: 1st June, 2017 to 1st December, 2017

Methods: A total of 119 patients with ileal perforations were included in this study. The patients presented with the significant history, signs and symptoms of peritonitis with the per-operative finding of ileal perforation(s). The detailed history, clinical examination and baseline investigations of all the patients were done. After cross-matching, screening and grouping, blood was arranged in all cases. All of the patients were initially resuscitated for fluid correction and electrolyte imbalance. Nasogastric tube was passed for gastric decompression and Foley catheterization was done for output monitoring. Broad spectrum antibiotics and analgesics were given. Patients presenting in a critical condition were treated with vital system support by administration of oxygen, atropine and adrenaline infusion when found hypotensive despite of adequate fluid replacement. After resuscitation, anesthetic consultation done and prepared for operation and then all patient exposed to exploration laparotomy. Selected Operative procedures depend on the pathology of the disease suspected. The data collected is based on peroperative findings. Data collected by this study is finally analyzed by SPSS 22.0.0.0.

The cases are included in this study on the basis of the following:

Inclusion Criteria:

- All the patients with signs and symptoms of peritonitis.
- The patients who underwent surgery and peroperatively ileal perforation was confirmed.
- Patients who did not have previous surgical history of ileal repair.

Exclusion Criteria:

- Patients having peritonitis due to any other cause or due to perforation at the site other than ileum.
- Patients with significant immunosuppression (DM, steroid use, post-transplant, retro positive).
- Patients with altered mental status (head injury, toxic encephalopathy).
- Patients who previously underwent laparotomy and now presenting with the ileal perforation as a result of late postoperative complication i.e. stricture perforation.

These conditions may act as confounder and produce bias in the results.

RESULTS

The results of this study show male preponderance. Out of 119 patients, 86 are male and 33 are female with the male to female ratio of 2.61 Table 1

Table 1: Frequency table of gender of the patients.

Valid	Frequency	Percent	Valid Percent	Cumulative percent
Female	33	27.7	27.7	27.7
Male	86	72.3	72.3	
Total	119	100.0	100.0	100.0

The ileal perforations are most common in 3rd and 4th decade of life as shown in Table 2.

Table 2: Age distribution of ileal perforations.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
0 to 10 years	5	4.2	4.2	4.2
11 to 20 years	20	16.8	16.8	21.0
21 to 30 years	19	16.0	16.0	37.0
31 to 40 years	25	21.0	21.0	58.0
41 to 50 years	22	18.5	18.5	76.5
51 to 60 years	8	6.7	6.7	83.2
61 to 70 years	13	10.9	10.9	94.1
71 to 80 years	5	4.2	4.2	98.3
81 to 90 years	2	1.7	1.7	100.0
Total	119	100.0	100.0	

According to the data collected, the causes of ileal perforation in descending order are as follows: Nonspecific 66 (55.5%), Traumatic 34 (28.6%), Typhoid 14 (11.8%), Intestinal Tuberculosis 3 (2.5%), and Iatrogenic 2 (1.7%). Table 3

Table 3: Frequency table of the cases of ileal perforations on its etiological basis.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
Nonspecific Perforations	66	55.5	55.5	55.5
Traumatic Perforations	34	28.6	28.6	84.0
Typhoid Perforations	14	11.8	11.8	95.8
Tuberculous Perforations	3	2.5	2.5	98.3
Iatrogenic Perforations	2	1.7	1.7	100.0
Total	119	100.0	100.0	

The nonspecific causes (55.5%) include predisposing factors i.e. intestinal obstruction (56.25%), Gut gangrene (7.81%), obstructed hernia (9.3%), IBS (crohn's disease) 1.6%, acute appendicitis (1.64%) and acute diverticulitis (1.64%). The traumatic causes include blunt trauma (75%) abdomen, penetrating injury to the abdomen (16.6%) and firearm injury to abdomen (8.33%) leading to ileal perforation(s). Typhoid perforation (11.8%) is the 3rd most common cause of ileal

perforation. Intestinal tuberculosis leading to ileal perforation accounts for 3 cases, 2.5% of total cases.

Iatrogenic perforations 2 (1.7%) includes post D & C ileal perforation(s). Perforations as complication of previous laparotomy or laparoscopic surgery are not included in this study.

DISCUSSION

In our present research, we studied 119 cases of ileal perforation and quantified them on the basis of possible etiologies. Among those patients, male predominance is observed, as 86 of the patients were male and 33 were female, making male to female ratio of 2.61:1. This result is consistent with 2.1:1 ratio by SP Afridi et al,¹¹ 3:1 by RA Wani et al¹⁵ and 2.5:1 by umer et al.¹⁶ The male preponderance for ileal perforation due to infectious diseases is multifactorial. It happens mainly due to the sex-linked differences in hygiene practices, habitual smoking, dining out behavior and hence the environmental exposure is more. The sex receptors are present on lymphocytes, macrophages as well as Peyer's patches, which plays a significant role in cytokine response to GI infection, which is predominately pre-inflammatory in males. This discrepancy is clarified on basis of sex hormones by M. Khan et al.¹⁰

As it is mentioned in our study, the incidence of ileal perforation is higher in 3rd and 4th decade which correlates with G. Singh et al, S. Mittal et al and Agarwal S et al.¹²⁻¹⁴

Typhoid and MTB are the top most infectious diseases leading to ileal perforation and our results correlates with this statement.⁶⁻¹²

The availability of vaccine against enteric fever, MDG 7 can reduce the number of affected people in low- and middle-income countries where the disease is prevalent. If we meet the vaccination protocol, then the incidence of typhoid fever could be the same as that of western world. Multi Drug Resistant Typhoid Fever (MDRTF) is the major problem in attaining the cover against typhoid fever as explained by Zaki SA et al.¹⁷ MDRTF is the enteric fever that is resistant to the vaccination and first-line antibiotics used as the treatment including chloramphenicol, ampicillin and trimethoprim-sulfamethoxazole. The S. Typhi strains are genetically monomorphic and shows the features of highly hosts adaptive properties. Moreover, the antibiotics used in routine for the typhoid fever are usually empiric. All of the above-mentioned characteristics of S. Typhi makes the strain resistant and difficult to be wiped out of the community.

The mainstay of infectious disease prevention and control is to identify their existence and magnitude. The most robust approach to find out the incidence of typhoid fever and MTB infection is by regular, community-wide household visits to identify the patient with febrile illness, chronic cough and all the other suggestive symptoms. Blood or sputum from those patients may be obtained for confirmation. Alternatively, the incidence can also be calculated by the combination of health seeking behavior survey and sentinel health care facility based

surveillance. A much greater effort is required for the sake of infectious disease control through improvements in sanitation, greater access to safe water and food, identification and treatment of S. typhi carriers and the more widespread use of currently available vaccines in high risk population.



CONCLUSION

Typhoid perforation is the 3rd most common cause of ileal perforation followed by tuberculous perforation. The incidence of typhoid perforation is decreasing worldwide but it is still an endemic in Pakistan.

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