

COMPARATIVE STUDY OF SALINE VERSUS METRONIDAZOLE PERITONEAL LAVAGE IN OPERATED PERITONITIS CASES

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ABSTRACT

Peritonitis is a fairly common emergency condition treated by general surgeons. Secondary peritonitis due to hollow viscous perforation, by far is the most common cause. Treatment mainstay is laparotomy, peritoneal lavage and closure of perforation. Different types of fluids like warm saline, distilled water, antibiotics like metronidazole, gentamycin, etc. have been used for lavage and abundant literature is available on their use.

In this study, patients who were operated for peritonitis were randomly allotted into saline and metronidazole lavage group. Postoperative complications like wound infection, intra-abdominal abscess, sepsis, faecal fistula and death were noted. The saline lavage group had 40% incidence of wound infection, 12% intra-abdominal abscess, 28% sepsis, 6% faecal fistula and 8% mortality. Metronidazole lavage group had 26% wound infection, 10% intra-abdominal abscess, 18% sepsis, 6% faecal fistula and 10% mortality.

There is no statistically significant difference in the outcome between the saline group and the metronidazole group.

KEYWORDS

Peritonitis, Peritoneal toilet, Metronidazole lavage.

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INTRODUCTION: Acute peritonitis a fairly common surgical emergency which is very challenging to manage. It may be caused secondary to hollow viscous perforation, transmigration of intestinal flora in case of bowel ischemia and rarely primary peritonitis.⁽¹⁾ Surgical closure of the perforation and intraoperative peritoneal lavage has been the cornerstone in the management of patients with peritonitis. Different types of fluids have been used for peritoneal lavage in peritonitis patients. These include, sterile water, warm saline, aqueous povidone-iodine, saline with antibiotics, etc.⁽²⁻⁴⁾

Peritoneal lavage reduces the bacterial load in the peritoneal cavity, reducing the sepsis and helps rapid recovery of the patient.^(5,6) Various antibiotics have been added to the lavage fluid which has been found beneficial in some studies.^(4,7-9) In this study, the effect of addition of metronidazole to the lavage fluid is compared to that of lavage with plain warm saline.

MATERIALS AND METHODS: This study was conducted in the Department of General Surgery, K.R Hospital and MMCR Mysore during the period of January 2009 to July 2010. A total of 100 patients were included in this study, out of which 86 were males and 14 were females. All patients who underwent laparotomy for peritonitis in the age group of 15- 60 years were included.

Patients presenting with clinical features of peritonitis were diagnosed with a combination of clinical examination, blood investigations, erect x-ray abdomen and ultrasound abdomen. Cases were randomly divided into two groups, each receiving plain saline peritoneal lavage and metronidazole lavage. Plain saline lavage group received intraoperative peritoneal lavage with 2 L of saline. Metronidazole lavage group received intraoperative peritoneal lavage using 2 L of saline mixed with 200 mL of metronidazole.

Cases were followed up till the discharge or death of the patient. Postoperative complications like wound infection, intra-abdominal abscess, sepsis, faecal fistula and death were noted. Postoperative hospital stay was noted. Results of both groups were compared statistically.

RESULTS: 100 cases were included in this study out of which 86 were males and 14 were females. Highest number of patients were in the age group of 21- 30 years (32%). The most common cause of peritonitis in this study was duodenal ulcer perforation (60%), followed by ileal (21%) and appendicular perforation (9%). Other causes were gastric perforation, ischemic bowel, traumatic jejunal perforation, perforated Meckel's diverticulum.

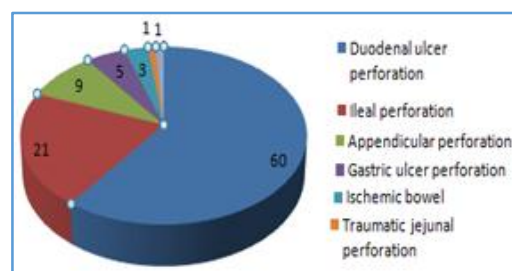


Fig. 1: Causes of peritonitis

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In most of the patients, perforation was closed primarily (78%). Out of which 60 were duodenal perforations, 12 were ileal perforations, 5 were gastric perforations and 1 was jejunal perforation. Resection and anastomosis of bowel was performed in 12 cases. (8 ileal perforations, 3 ischaemic bowels, 1 perforated Meckel's diverticulum). Appendicectomy was done in 9 cases. One patient with ileal perforation underwent ileostomy.

The saline lavage group had 40% incidence of wound infection, 12% intra-abdominal abscess, 28% sepsis, 6% faecal fistula and 8% mortality. Metronidazole lavage group had 26% wound infection, 10% intra-abdominal abscess, 18% sepsis, 6% faecal fistula and 10% mortality.

Parameter	No. Of cases	Total cases	Percentage
Wound infection	20	50	40%
Intra-abdominal abscess	6	50	12%
Sepsis	14	50	28%
Faecal fistula	3	50	6%
Death	4	50	8%

Table 1: Saline lavage group

Parameter	No. Of cases	Total cases	Percentage
Wound infection	13	50	26%
Intra-abdominal abscess	5	50	10%
Sepsis	9	50	18%
Faecal fistula	3	50	6%
Death	5	50	10%

Table 2: Metronidazole lavage group

There was a 14% reduction in the incidence of wound infection in metronidazole lavage group when compared to saline lavage group. Incidence of intra-abdominal abscess reduced by 2% in metronidazole lavage group. 10% reduction was seen in the incidence of sepsis in patients receiving metronidazole peritoneal lavage. There was no difference in the incidence of faecal fistula in either groups. Mortality was higher in metronidazole lavage group by 2%. Chi-square test did not show any statistical significance of these apparent advantages of metronidazole lavage over saline lavage.

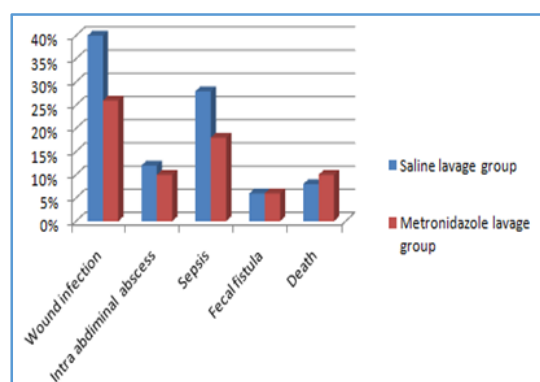


Fig. 2: Comparison between saline and metronidazole groups

DISCUSSION: In this study, it was found that maximum number of cases were in the age group of 21 to 30 years. Least number of cases were in the age group of < 20 years. Mean age of patients in this study was 37.25 years. This is comparable to the age distribution found by Dalvi et al⁽¹⁰⁾ where maximum patients were in the age group of 31-40 years. Mean age was 37 years. There was a male preponderance of cases in the present study, which is consistent with the values obtained by other studies. Duodenal perforation was the leading cause of peritonitis in this study, followed by ileal perforation and appendicular perforation. Gastric perforation, bowel ischemia, jejunal perforation and perforation of Meckel's diverticulum were the other less common causes of peritonitis.

In this study, there was 14% reduction in incidence of wound infection in the metronidazole lavage group. However, this difference is not statistically significant (P value 0.2). Similarly, Dalvi et al reported 20% reduction in incidence of wound infection, when superoxide solution was used for intra-operative peritoneal lavage (IOPL). On contrary, Schein et al^(11,12) did not find any difference in incidence of wound infection when chloramphenicol was used for IOPL.

There was a 2% reduction in the incidence of postoperative intra-abdominal abscess in the metronidazole IOPL group. However, this is not statistically significant. R. Fowler⁽¹³⁾ in 1974, reported 16% reduction in the incidence of intra-abdominal abscess when Cephaloridine was used for IOPL. In this study, there was 10% reduction in the incidence of systemic sepsis in the metronidazole IOPL group. Statistically significant difference was not found in the incidence of sepsis between either groups.

Study did not find any difference in the incidence of postoperative faecal fistula in saline lavage group or metronidazole lavage group. In contrast to this study, Dalvi et al(2009) reported 2.5% reduction in the incidence of faecal fistula in the study group, when superoxide solution was used for IOPL. This was not significant statistically.

Mortality was 2% higher in the metronidazole IOPL group in this study. But the difference is not statistically significant. Schein (1990) found no significant difference in mortality of patients treated with or without intraperitoneal lavage with chloramphenicol. Rambo (1972)(7) also found no difference in the number of deaths when intraperitoneal irrigation with cephalothin was used. On the contrary, Bhushan et al⁽¹⁴⁾ (1975) found significant reduction in mortality in patients treated with antibiotic lavage.

CONCLUSION: Peritonitis is most common in the age group of 21 to 30 years (32%). There is a male preponderance with male: female ratio of 6.14:1. Duodenal ulcer perforation (60%) is the most common cause of peritonitis, followed by ileal (21%), appendicular (9%) and gastric perforations (5%). Ischaemic bowel (3%), perforation of Meckel's diverticulum (1%) and jejunal (1%) perforations are the rarer causes. Primary closure of the perforation with omental patch is the most commonly performed operation (78%) followed by resection of the

perforated segment of the bowel and end-to-end anastomosis (12%), appendectomy (9%) and ileostomy(1%). There is no statistically significant difference in the outcome between the saline group and the metronidazole group.

REFERENCES:

1. Saha SK. Peritoneal lavage with metronidazole. *Surg Gynecol Obstet* 1985;160(4):335-338.
2. Whiteside OJH, Tytherleigh MG, Thrush S, et al. Intra-operative peritoneal lavage-who does it and why? *Ann R Coll Surg Engl* 2005;87(4):255-258.
3. Schein M, Gecelter G, Freinkel W, et al. Peritoneal lavage in abdominal sepsis. A controlled clinical study. *Arch Surg* 1990;125(9):1132-1135.
4. Myers E, Hurley M, O'Sullivan GC, et al. Laparoscopic peritoneal lavage for generalized peritonitis due to perforated diverticulitis. *Br J Surg* 2008;95(1):97-101.
5. Zhao K, Kirman I, Tschepen I, et al. Peritoneal lavage reduces lipopolysaccharide-induced elevation of serum TNF-alpha and IL-6 mortality in mice. *Inflammation* 1997;21(4):379-390.
6. Johnson CC, Baldessare J, Levison ME. Peritonitis-update on pathophysiology, clinical manifestations and management. *Clin Infect Dis* 1997;24:1035-1047.
7. Rambo WM. Irrigation of the peritoneal cavity with cephalothin. *Am J Surg* 1972;123(2):192-195.
8. Broderick T, Matthews J. Ulcer complications. In: Zinner M, Ashley S, eds. *Maingots Abdominal Operations*. Philadelphia: Mc Graw Hill Medical 2007;11th edn:253-256.
9. Schein M, Saadia R, Freinkel Z, et al. Aggressive treatment of severe diffuse peritonitis: a prospective study. *Br J Surg* 1988;75(2):173-176.
10. Davli AN, Gondhlekhar AR, Upadhye AS. Postoperative irrigation in the management of amoebic peritonitis. *J PG Med* 1987;33(2):61-64.
11. Schein M, Saadia R, Decker GA. Perforated peptic ulcer at the JG Strijdom Hospital. A retrospective study of 99 patients. *South African medical journal = Suid-Afrikaanse tydskrif vir geneeskunde* 1986;70(1):21-23.
12. Schein M, Saadia R, Decker G. Intraoperative peritoneal lavage. *Surg Gynecol Obstet* 1988;166(2):187-195.
13. Fowler R. A controlled trial of intraperitoneal cephaloridine administration in peritonitis. *J Pediatr Surg* 1975;10(1):43-50.
14. Bhushan C, Mital VK, Elhence IP. Continuous postoperative peritoneal lavage in diffuse peritonitis using balanced saline antibiotic solution. *Int Surg* 1975;60(10):526-528.