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A COMPARISION BETWEEN METROGYL AND NORMAL WARM SALINE INTRAOPERATIVE PERITONEAL LAVAGE IN PREVENTION OF POST OPERATIVE ABDOMEN DEHISCENSE: A PROSPECTIVE STUDY

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INTRODUCTION

Intra-abdominal sepsis is associated with high morbidity and mortality mostly arising from peritonitis caused by perforated peptic ulcer, typhoid ulcer, appendix and other causes of gangrenous gut. Peritonitis is defined as the inflammation of thin tissue layer surrounding the abdominal organs. Acute generalized peritonitis is considered as the surgical emergency. Sequestration of fluid and electrolytes result in electrolyte imbalance leading to hypovolemia and finally shock or acute renal failure. Surgeons are able to reduce systemic infection, but SSI remains a challenge where incidence still may be as high as 60-70%.[1] General supportive measures such as maintenance of hydration, correction of electrolytes imbalance and intravenous antibiotics are provided. The mainstay of the treatment in case of perforation is the surgical closure. Along with this, intraoperative peritoneal lavage plays an important role in the treatment of peritonitis.[2-4] The mode of action of this method is that it decreases the load of bacteria, thus reducing the severity of disease and hastens the recovery of the patient.[5] A study by Ahrenholz has shown that irrigation with these solutions not only dilute bacterial mass, but also impair bacterial phagocytosis because of dilution of defensive proteins like opsonins.[6] Traditionally, sterile water, warm saline and povidone-iodine are most commonly used for the purpose of peritoneal lavage. Some researchers recommend the addition of antibiotics in these fluids for better results. Among various antibiotics, metronidazole has proved to be most beneficial in treating the peritonitis.[7-9] Metronidazole is an antibiotic and antiprotozoal drug. It is used either alone or with other antibiotics to treat pelvic inflammatory disease, endocarditis, bacterial vaginosis, dracunculiasis, giardiasis, trichomoniasis and amoebiasis.[10] Despite the profound reduction in peritoneal bacterial counts the rate of post-operative sepsis, wound infection, intra-abdominal abscess and septicemia were extremely high. These results indicate that saline peritoneal lavage alone is no substitute for short-term antimicrobial prophylaxis. Still the literature regarding the advantage of using antibiotics along with sterile water for peritoneal lavage is lacking. Hence, this study is conducted to compare the effect of sterile warm water and antibiotics for the purpose of peritoneal lavage.

MATERIALS AND METHODS

This study was conducted in Department of surgery at Vardhaman Mahavir medical college and Safdarjung hospital, New Delhi from January 2016 to December 2016. One Hundred and twenty patients were included in this study, however 20 patients died therefore excluded from study. On the basis of paper slips, these cases were randomly allocated in the Group NS and Group MG consisting of 50 cases each. Only those patients who were found to have peritonitis on exploratory laparotomy were included in the study. Patients with evidence of enteric encephalopathy, liver diseases and renal diseases, history of steroid intake, heart disease and known allergy to any substance or any other immune compromised condition were excluded from the study. After proper and detailed clinical history, patients were examined for signs of peritonitis and investigated for confirmation of peritonitis. After proper resuscitation of patients with intravenous fluids, all patients were subjected to exploratory laparotomy. At the time of operation, a

sample of peritoneal fluid was collected in a sterile culture vial and transported to Microbiology Department for isolation and identification of the organism and their sensitivity to antibiotics.

INTRAOPERATIVELY

Characteristics of fluid were noted (purulent/serous), color, site, size and number of perforations were noted. Any other associated pathology was noted. Operative procedure was carried out. After the definitive surgery, patients were randomly put into two groups.

GROUP NS (Normal saline)

In this group, after doing definitive surgery for pathology the peritoneal cavity was washed with 1-2 ltr of warm saline. Then the abdominal cavity was closed after putting in drains.

GROUP MG (Metronidazole)

In the study group, after definitive surgery for pathology, the peritoneal cavity was washed with 1-2 ltr of warm saline. Then 100 ml of metronidazole solution was put in the peritoneal cavity and the abdomen was closed after putting drains. The drains were clamped for 1 h so that the metronidazole did not escape.

POST-OPERATIVE COURSE

The antibiotics given post-operatively were the same in all patients, i.e., ceftriaxone (1.5 g twice a day intravenously for 7 days), metronidazole (400 mg thrice a day intravenously for 5 days). The wound was primarily dressed with sterile surgical gauze and covered with occlusive adherent bandage. The primary dressing was removed after 24 h and daily dressing was carried out with povidone-iodine solution. The wound was inspected for signs of infection (sinus formation, seroma formation and pus formation) and dehiscence before each dressing. Swab cultures from the wound were sent for microbiological culture and antibiotic sensitivity if any signs of infection ware present. Patients were then put on antibiotics according to the culture and sensitivity report if they showed any sign of SSI. Drain output was monitored daily; amount and also its character (serous/purulent). The drains were removed when output was <50 ml daily and serous. Day of drain removal was noted. If two drains were present then day of removal of both drains was noted separately. Return of bowel sound was noted and observed by hearing 3-4 bowel sounds/min by stethoscope just right to the umbilicus. Number of days for which the patient stayed in the hospital was recorded. Stitches were removed on 10th post-operative day.

OBSERVATION AND RESULT

Table 1 shows that majority of the patients (46%) in both groups were 31-40 years of age with a mean age of 40.28 years. The mean age was 41.6 ± 13.77 and 44.9 ± 12.68 years respectively in the NS & MG group. Six patients (12%) were in the 4th and 5th decades of life in the NS group, whereas nine (18%) and five (4%) patients were in the 4th and 5th decade of life respectively in MG group. Majority of the patients were males (76/100).

Table 1: Distribution of patients according to age and gender in both groups

Demographic factor	Group NS (%)	Group MG (%)	Combined
Age			
18-30	10 (20)	12 (24)	22
31-40	24 (48)	22 (44)	46
41-50	6(12)	9 (18)	15
51-60	6 (12)	5 (11)	11
>60	4 (8)	2 (4)	6
Gender			
Male	39 (78)	37 (74)	76
Female	11 (22)	13 (26)	24

Table 2 shows that in both groups, the most common site of perforation was the ileum (50%), followed by duodenum (15%) and stomach (15%). The least common site was colon in both the groups. Ileal perforation was mainly due to enteric fever and in nine cases it was caused by trauma. Duodenal and gastric perforations were complications of peptic ulcer. Appendicular perforation was the sequel of acute appendicitis. There were 3 cases of colon perforation, 1 was sigmoid and 1 was descending colon perforations, both were due to trauma. One case of ascending colon perforation was spontaneous. (Figure 1).

Table 2: Distribution of patients according to site of perforation in both groups

Site of perforation	Group NS	Group MG	Total
Duodenal perforation	7	8	15
Gastric perforation	8	7	15
Ileal perforation	24	26	50
Jejunal perforation	4	4	8
Appendicular perforation	5	4	9

Colon perforation	2	1	3
Total	50	50	100

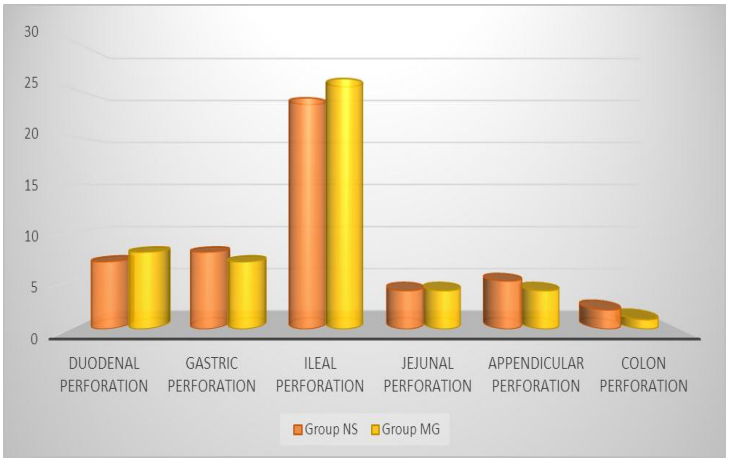
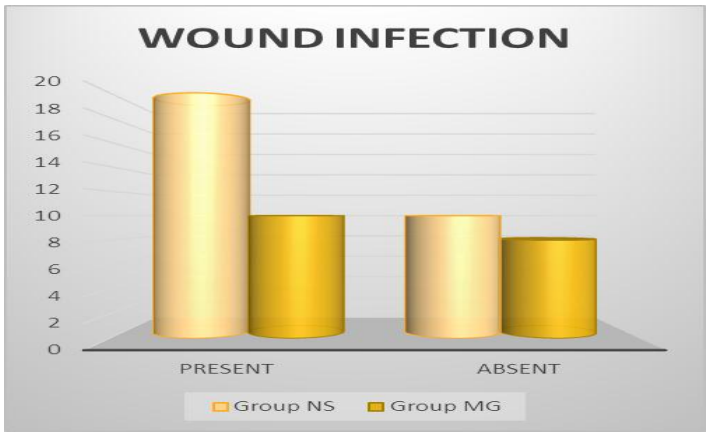


Figure 1 Distribution of patients according to site of perforation in both groups

Table 3 shows that superficial SSI rate was higher in the NS group (67%) compared to MG group (56%). The difference was statistically significant (p< 0.05). Burst abdomen was present in 20 cases in the NS group and 8 cases in the MG group. This difference is statistically significant with p value <0.05. (Figure 2 & 3).

Table 3: Prevalence of wound infection and burst abdomen in the both Groups.

Complication	Group NS (%)	Group MG (%)	p-Value
Wound infection			
Present	20 (67)	10 (56)	**p > 0.05**
Absent	10 (33)	8 (44)	
Burst abdomen			
Present	20 (40)	8 (16)	**p < 0.05**
Absent	30 (60)	42 (84)	



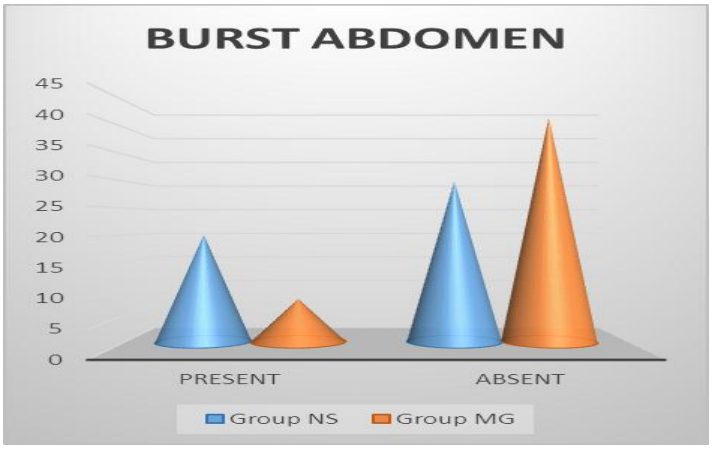


Figure 2 & 3 Prevalence of wound infection and burst abdomen in the both Groups.

DISCUSSION

Bacterial peritonitis still presents a challenge in surgical causality, carrying a high mortality and morbidity. In our setup a long delay occurs before the patients report to the hospital for treatment. Even though mortality and morbidity has been reduced drastically, due to proper use of antibiotics, pre and post-operative resuscitation and early surgery, yet the complications like wound infections, residual abscesses and paralytic ileus do occur. To decrease the incidence of such complications the idea of intraperitoneal lavage with antibiotics was introduced. Burnett et. al[11] were the first to use sulfonamides in intraperitoneal lavage with striking results. With advanced research and developments various other drugs like amino glycosides, penicillin and tetracycline have been used. With this aim, we decided to use the metronidazole which has a wide range of antibacterial activity, is highly soluble and the solution remains stable at room temperature. In majority of our cases, the cause of generalized peritonitis was perforated viscera, as was also observed by Divincenti and Cohn[12] and also by Nomikos[13] and coworkers. In this study, it was found that maximum number of cases were in the age group of 31 to 40 years. Least number of cases were in the age group of >60 year. 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. There was a male preponderance of cases in the present study, which is consistent with the values obtained by other studies. Ileal perforation was the leading cause of peritonitis in this study, followed by duodenal and gastric perforation. Appendicular, Jejunal and colonic perforation were the other less common causes of peritonitis. In this study, there was 11% reduction in incidence of wound infection in the metronidazole lavage group. However, this difference is not statistically significant (P value >0.05). 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] did not find any difference in incidence of wound infection when chloramphenicol was used for IOPL. There was a statistically significant reduction in the incidence of postoperative intra-abdominal abscess in the metronidazole group. R. Fowler[14] in 1974, reported 16% reduction in the incidence of intra-abdominal abscess when Cephaloridine was used for IOPL. Schein (1990) found no significant difference in mortality of patients treated with or without intraperitoneal lavage with chloramphenicol. Rambo[7] (1972) also found no difference in the number of deaths when intraperitoneal irrigation with cephalothin was used. On the contrary, Bhushan et al[15] (1975) found significant reduction in mortality in patients treated with antibiotic lavage. Parcel J.P et al[16] also suggest that abdominal irrigation with an antibiotic solution is superior to both normal saline and Dakin's solution.

CONCLUSION

We conclude that intraoperative peritoneal lavage with metronidazole in the patients of peritonitis is more beneficial as compared to saline.

CONFLICT OF INTEREST

Author States That “There is No Conflict Of Interest”.

REFFRENCES

1. Jhobta RS, Attri AK, Kaushik R, Sharma R, Jhobta A. Spectrum of perforation peritonitis in India – Review of 504 consecutive cases. World J Emerg Surg 2006; 1: 26.
2. Schein M, Gecelter G, Freinkel W, Gerding H, Becker PJ. Peritoneal lavage in abdominal sepsis. A controlled clinical study. Arch Surg 1990; 125: 1132-5.
3. Myers E, Hurley M, O’Sullivan GC, Kavanagh D, Wilson I, Winter DC. Laparoscopic peritoneal lavage for generalized peritonitis due to perforated diverticulitis. Br J Surg 2008; 95: 97-101.
4. Zhao K, Kirman I, Tschepen I, Schwab R, Weksler ME. Peritoneal lavage reduces lipopolysaccharide-induced elevation of serum TNF-alpha and IL-6 mortality in mice. Inflammation 1997; 21: 379-90.
5. Johnson CC, Baldessarre J, Levison ME. Peritonitis: Update on pathophysiology, clinical manifestations, and management. Clin Infect Dis 1997; 24: 1035-45.

6. Ahrenholz DH. Effect of intraperitoneal fluid on mortality of Escherichia coli peritonitis. Surg Forum 1979; 30: 483-4.
7. Rambo WM. Irrigation of the peritoneal cavity with cephalothin. Am J Surg 1972; 123: 192
8. Broderick T, Matthews J. Ulcer complications. In: Zinner M, Ashley S, editors. Maingots Abdominal Operations. 11th ed. Philadelphia, PA: McGraw Hill Medical; 2007; 253-6.
9. Schein M, Saadia R, Freinkel Z, Decker GA. Aggressive treatment of severe diffuse peritonitis: A prospective study. Br J Surg 1988; 75: 173-6.
10. Dalvi AN, Gondhalekar RA, Upadhye AS. Post-operative irrigation in the management of amoebic peritonitis. J Postgrad Med 1987; 33: 61-4.
11. BWlett WE et. al. TIle treatment ofperitonitis lIsing peritoneal lavage. Annals a/surgery 1957; 45: 175-79.
12. Divincenti FC, Cohn 1. Intraperitoneal Kanamycin in adVaI1Ced peritonitis. Am J Surg 1966; 111(1): 147-53.
13. Nomikos IN, Ketsouyanni K, Papaioannoll AN. Washing with or without chloramphenicol in the treatment of peritonitis. A prospective clinical trial. Surgery 1986; 99(1): 20-25.
14. Fowler R. A controlled trial of intraperitoneal cephaloridine administration in peritonitis. J Pediatr Surg 1975; 10: 43-50.
15. 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.
16. Parcells JP1, Mileski JP, Gnagy FT, Haragan AF, Mileski WJ. Using antimicrobial solution for irrigation in appendicitis to lower surgical site infection rates. Am J Surg. 2009 Dec; 198(6): 875-80.