



## Intraoperative Lavage in Patients Undergoing Emergency Laparotomy for Prevention of Wound Infection: A Comparitive Study between Normal Saline and Metronidazole

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### Abstract

*Intraoperative peritoneal lavage plays an important role in a treatment of peritonitis. Sterile water, warm saline, and povidone-iodine are most commonly used for the purpose of peritoneal lavage. But now, the addition of antibiotics in these fluids is supposed to give better results. Among various antibiotics, metronidazole has proved to be most beneficial in treating the peritonitis.*

**Materials and Methods:** 271 patients who got admitted through SOPD, casualty or transferred from other departments and underwent emergency laparotomy during the period of study were included in the study irrespective of the age and sex. Patients were randomly distributed into two groups.

*One received intraoperative peritoneal lavage with 5 litres of normal saline and others received lavage with 5 litres of normal saline along with 100ml of metronidazole.*

*Post operative wound infections were recorded. Results of both the groups were analyzed statistically with the help of chi square test. P value of < 0.05 was considered statistically significant.*

**Results:** The mean age of the patients in our study was 36.1 and standard deviation of 15

*Out of 271 patients, 219 were males 52 were females. Most common etiology of peritonitis was Peptic perforation (35.4%) followed by ileal perforation (23.6%)*

*Wound s\infections were statistically more with patients who received only normal saline for lavage as compared to patients with normal saline and topical metronidazole.*

**Conclusion:** Addition of peritoneal lavage with high concentrations of appropriate antibiotics in saline combined with the basic principles of good surgery and the systemic administration of antibiotics, offers the patient a much better chance to recover and has few if any ill effects.

**Keywords:** Peritonitis, Lavage, Metronidazole, Wound infection.

## Introduction

Post operative complications have always been a matter of concern to surgeons. The post operative complications are of significance as many of them lead to prolonged hospitalization and increase in morbidity/mortality. Their timely recognition & management are surgeon's responsibility. Laparotomy is a common surgical procedure performed by a surgical team. There are many indications for laparotomy which may be acute abdominal conditions for emergency laparotomies and chronic for elective laparotomies. But its role remains the same that is life saving. Large numbers of patients are admitted in surgical wards and majority of them undergo emergency abdominal surgeries. Some of them may develop postoperative complications subsequently.

One of the most important complication following emergency surgery is Wound infection. Before the studies of Louis Pasteur and their application in surgical practice by Joseph Lister over 100 years ago, most if not all surgical wounds becomes infected. After Pasteur's discovery of bacteria Lister was prompt to recognize their implication in wound infection. His paper "on the Antiseptic principle in the practice of surgery." published in 1867 revolutionized the practice of surgery. His "principle of aseptic surgery" was based upon the exclusion of all bacteria from the wound made by surgeon, permitting healing to take place without significant contamination and with a very low incidence of infection. With the introduction of chemotherapeutic agents and antibiotics by Paul Ehrlich, Sir Alexander Fleming and Gerhard Domagk, it was expected that serious infections complicating surgical practice would be eliminated. Unfortunately post operative wound infection still constitutes a major cause of post-operative morbidity and mortality of present day surgery.

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<sup>1-3</sup>. 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<sup>4</sup>. 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<sup>5-6</sup>. Metronidazole is an antibiotic and antiprotozoal drug. It inhibits nucleic acid synthesis by disrupting the DNA of microbial cells. Adjuvant metronidazole lavage provides confidence in the treatment of intraperitoneal abscess, and it enhances a quick recovery. It is safe to use and cost effective.

Present study has been taken to compare the effect of intraoperative normal saline and the combination of normal saline with metronidazole for the prevention of post operative wound infections in patients undergoing emergency abdominal surgery.

## Materials & Methods

The present study was carried out in 271 patients in the Department of Surgery, Shyam Shah Medical College and associated G.M. and S.G.M. Hospitals, Rewa (M.P.) during the period of 1<sup>st</sup> August 2015 to 31<sup>st</sup> July 2016.

Patients were admitted in surgical wards through OPD, casualty or admitted in other wards and then transferred to surgery.

Patients were interrogated in detail regarding their particulars, presenting complaints, past history, treatment received, any previous surgery done etc. Patients were resuscitated by IV fluid, antibiotic and supportive treatments.

Diagnostic investigations like X- ray abdomen, USG abdomen were done; other essential investigations like hemoglobin, TLC, DLC, blood sugar, LFT, blood urea, sr. creatinine etc were done.

Patients were given antibiotic and supportive treatment. Patients who were fit for surgery, exploratory laparotomy was done. Patients were

randomized into 2 groups. One received intraoperative peritoneal lavage with 5 litres of normal saline and others received lavage with 5 litres of normal saline along with 100ml of metronidazole.

Post operative wound infections were recorded. Results of both the groups were analyzed statistically with the help of chi square test. P value of  $< 0.05$  was considered statistically significant.

Patients were discharge with advice to attend SOPD for follow up.

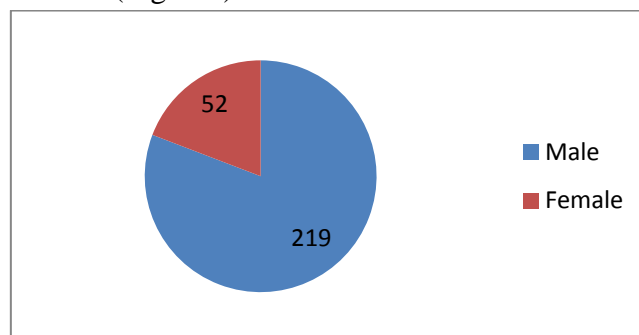
### Results

The mean age of the patients in our study was 36.1 and standard deviation of 15(Table 1)

**Table no 1:** Distribution of cases according to age

S. No.	Age Group in Years	Total no. of cases
1	0 to10	19
2	11 to 20	36
3	21 to 30	65
4	31 to 40	52
5	41 to 50	44
6	51 to 60	29
7	61 to70	15
8	>70	11
<b>Total</b>		<b>271</b>

Out of 271 patients, 219 were males 52 were females (Figure1).



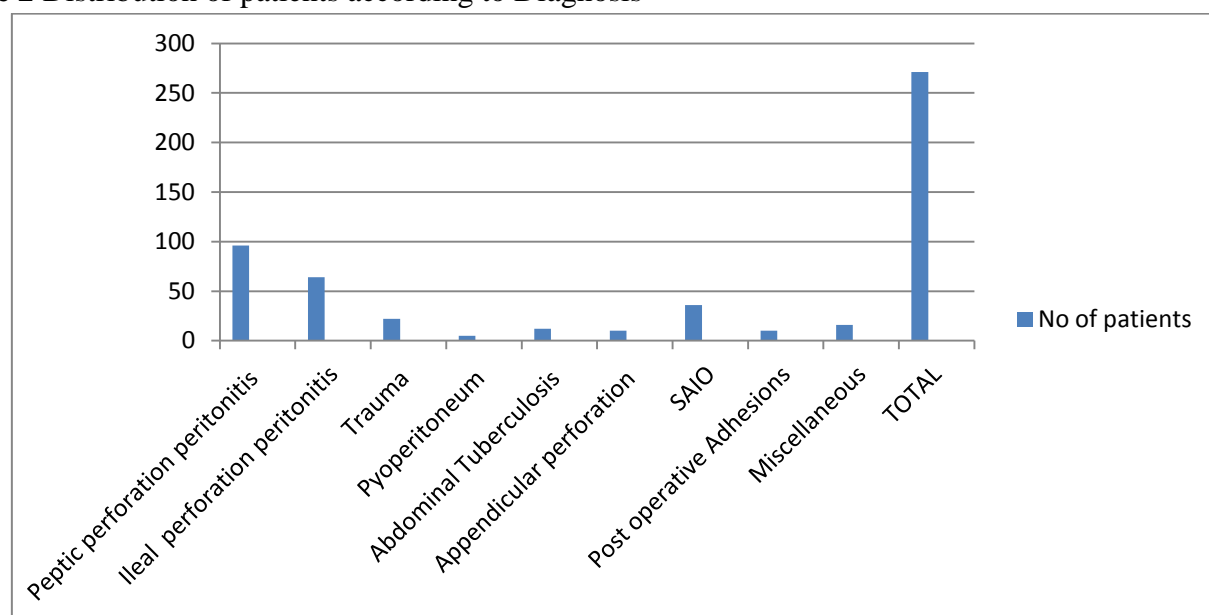
**Figure 1** Distribution of cases according to sex

Most common etiology of peritonitis was Peptic perforation (35.4%) followed by ileal perforation (23.6%)(Figure 2, Table 2).

**Table no 2:** Distribution of patients according to diagnosis

Diagnosis	No of patients
Peptic perforation peritonitis	96
Ileal perforation peritonitis	64
Trauma	22
Pyoperitoneum	5
Abdominal Tuberculosis	12
Appendicular perforation	10
SAIO	36
Post operative Adhesions	10
Miscellaneous	16
<b>TOTAL</b>	<b>271</b>

**Figure 2** Distribution of patients according to Diagnosis



Out of 72 patients in whom intra operative metronidazole was not used with peritoneal lavage, 19 patients (26.3%) developed wound infection.

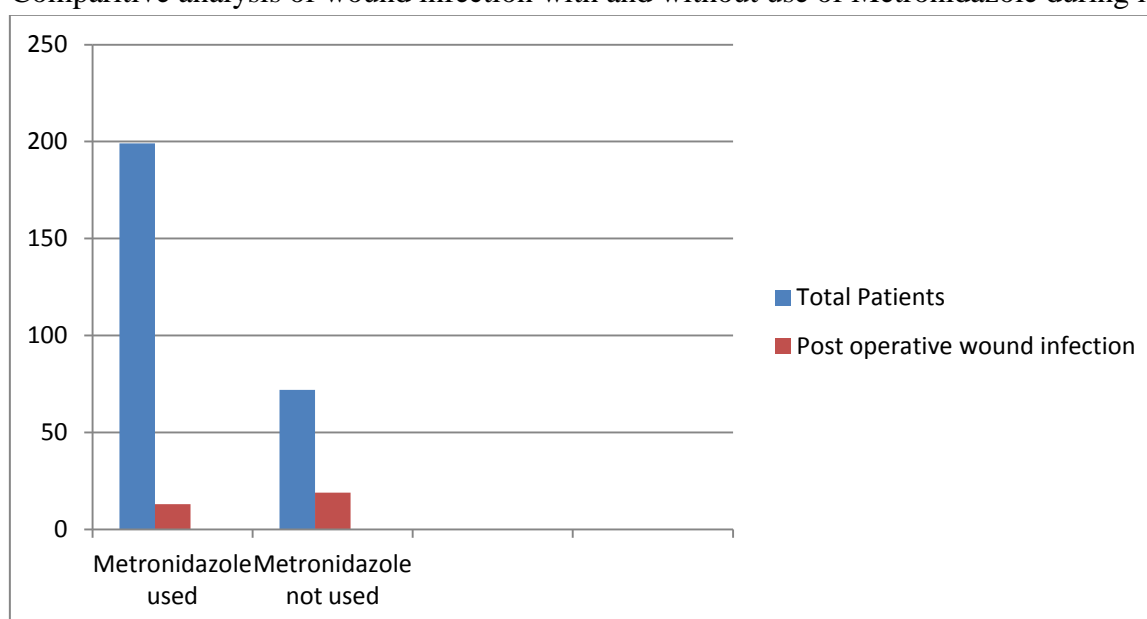
While, out of 199 patients in whom metronidazole was used; only 13 patients (6.53%) developed wound infection.(Table 3, Figure 3)

In our study chi square value 18.5 with  $P < 0.0001$  shows statistical significance that wound infections are less when intra operative metronidazole is used as compared to use of only normal saline for lavage.

**Table no 3:** Comparitive analysis of wound infection with and without use of Metronidazole during lavage

Metronidazole use in lavage	Total Patients	Post operative wound infection				Statistical Analysis
		Yes	%	No	%	
Yes	199	13	6.53	186	93.4	Chi square= 18.15 , $P < 0.0001$
No	72	19	26.3	53	73.6	
Total	271	32		239		

**Figure 3** Comparitive analysis of wound infection with and without use of Metronidazole during lavage



## Discussion

Various studies compare use of metronidazole with normal saline for peritoneal lavage.

Harpreet singh, Malika Agrawal, Naveen Singh<sup>7</sup> (2016) reported that incidence of 50%(21 out of 42) when no local drug was used as compared to 30% when metronidazole was used.

Dalvi et al<sup>8</sup> reported 20% reduction in incidence of wound infection with use of intraoperative topical metronidazole.

In our study, out of 72 patients in whom intra operative metronidazole was not used with peritoneal lavage, 19 patients (26.3%) developed wound infections.

While, out of 199 patients in whom metronidazole was used, only 13 patients (6.53%) developed wound infections.

In present study we found chi square value 18.5 with  $P < 0.0001$  showing strong association with reduction in post operative wound infection with use of metronidazole.

## Conclusion

Peritoneal lavage with appropriate use of intraoperative metronidazole in saline combined with the basic principles of good surgery and the systemic administration of antibiotics, offers the patient a much better chance to recover and has few if any ill effects.

**References**

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