

ORIGINAL ARTICLE

Role of Metronidazole after Appendicectomy in Simple Cases of Acute Appendicitis

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ABSTRACT

Background: Simple cases of acute appendicitis are usually dealt with appendicectomy and post-operative antibiotics. Causative organisms include both aerobes as well as anaerobes. The antibiotic spectrum to cover aerobes varies from hospital to hospital but the drug Metronidazole is used to cover anaerobes which is fairly common

Aim: To determine the role of metronidazole after appendicectomy in simple cases of acute appendicitis

Study design: Randomized, controlled, multicenter trial.

Place and duration of study: Department of Surgery, Central Park Teaching Hospital Lahore, Noor Hospital, Kot Radha Kishan and Bilquees Hospital, Kasur from 1st January 2020 to 31st December 2021

Methodology: One hundred and thirty patients were included in the study divided into 2 groups (65 in each group). Inclusion criteria included all patients of simple acute appendicitis from age 13 to 70 years. Exclusion criteria were patients with complications of acute appendicitis. Patients receiving Metronidazole were allocated group A, while those not receiving this drug were allocated group B. Open appendicectomy was done in all cases. Variables of interest were post-operative wound infection, hospital stay and nausea/vomiting.

Results: Mean age of patients of group A was 29.39±16.32 years while mean age of patients in group B was 34.18±18.05 years. 44.6% patients of group A were male and 55.4% were females. On the other hand 50.8% patients of group B were male and 49.2% were females. In group A, 6 patients got wound infection (9.2%) while 59 patients had uneventful recovery (90.8%). In group B, 4 patients got wound infection making it 6.2% while rest of the 61 patients had uneventful recovery (93.8%). The difference between the 2 groups was not statistically significant (p-value 0.11). Mean hospital stay in group A patients was 2.28±0.89 days while in group B it was 2.12±0.73 days.

Conclusion: Metronidazole is an effective drug against anaerobes but in simple cases of non-perforated appendicitis this drug does not decrease the wound infection rate after appendicectomy.

Keywords: Metronidazole, Appendicitis, Appendicectomy

INTRODUCTION

Appendicectomy is one of the most common surgical procedure done in general surgery department^{1,2}. Mostly acute appendicitis is the indication for this surgery³. Acute appendicitis may be simple or it may be associated with complications like gangrene, perforation and periappendicular abscess formation.⁴ Simple case of acute appendicitis is usually dealt with appendicectomy⁵ and post-operative antibiotics⁶. Complicated cases also require surgery but prolonged antibiotic use.

Causative organisms of simple cases of acute appendicitis include both aerobes as well as anaerobes^{7,8}. In complicated appendicitis mostly anaerobes are prevalent⁹. The antibiotic spectrum to cover gram positive and negative aerobes varies from hospital to hospital. But the drug used to cover anaerobes is fairly common and is used by almost all hospitals and that drug is Metronidazole. This drug is associated with nausea and vomiting due to its metallic taste either given intravenous or oral¹⁰. This nausea and vomiting could be very severe in some patients and it leads to discomfort and prolonged hospital stay.

Although it is a proven fact that metronidazole is very effective against anaerobic organisms¹¹ but can it be omitted from our antibiotic regimen in simple cases of acute appendicitis after appendicectomy.

The aim of this study was to see whether wound infection rate increases if we don't give Metronidazole post operatively.

MATERIALS AND METHODS

It was a randomized, controlled, multicenter trial study. It was carried out in three hospitals i.e. Central Park Teaching Hospital,

Lahore, Noor Hospital, Kot Radha Kishan and Bilquees Hospital, Kasur from January 2020 to December 2021. Total 157 patients were operated for acute appendicitis out of which 27 were excluded from the study and 130 patients were included in the study.

Inclusion criteria included all patients of simple acute appendicitis from age 13 to 70 years. Exclusion criteria were patients with complications of acute appendicitis like perforation, peritonitis, mass formation and peri-appendicular abscess. Patients who were diabetics, those taking immunosuppressive drugs, those who had organ transplant, obese patients and patients having coagulopathy or malignancy were also excluded from the study.

One hundred and thirty patients were divided into 2 groups (65 in each group) by simple consecutive allocation method, not considering age and sex. Informed consent was taken from all the patients. All patients were operated free of cost and by only one surgeon to eliminate cost and surgeon bias.

Patients receiving Metronidazole were allocated group A, while those not receiving this drug were allocated group B. Patients of both groups were operated by open method. Laparoscopic appendicectomy was not done in any patient involved in this trial. Variables of interest were post-operative wound infection, hospital stay and nausea/vomiting. Wound infection was labelled when there was redness, swelling or discharge from the wound. This parameter was measured for 7 days after surgery even if patient was discharged he/she was called for follow up in OPD and these features were noted. Length of hospital stay was measured in number of days for which patient remained admitted in hospital. It also included the no. of days for re-admission. Nausea and vomiting was labelled when patient required anti-emetic drugs.

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We used SPSS version 22 to perform the statistical analysis of our data. The Pearson Chi-square test was used to observe association between categorical variables. The comparison between both the groups was done with the help of t-test for parametric data while with the help of Mann Whitney equation for non-parametric data. A p-value of ≤ 0.05 was calculated to be statistically significant.

RESULTS

The mean age of patients of group A was 29.39 ± 16.32 years while mean age of patients in group B was 34.18 ± 18.05 years. The 2 groups were statistically similar as far age factor is concerned (p-value 0.15). 44.6% patients of group A were male and 55.4% were females. On the other hand 50.8% patients of group B were male and 49.2% were females. Statistically both groups were also similar when gender is considered (Table 1).

According to post-operative wound infection, in group A, 5 out of 65 patient had superficial surgical site infection while 1 patients had deep infection into the muscle plane and required debridement of wound. Total 6 patients got wound infection (9.2%) while 59 patients had uneventful recovery (90.8%). In group B, 4 patients had superficial surgical site infection and no patient had deeper infection. In total 4 patients got wound infection in group B making it 6.2% while rest of the 61 patients had uneventful recovery (93.8%). The difference between the 2 groups was not statistically significant (p-value 0.11) (Table 2).

After 2 days all patients were discharged. Patients who had wound infections were readmitted and were given either IV antibiotics or debridement. So the total hospital stay for patients with wound infection increased. Mean hospital stay in group A patients was 2.28 ± 0.89 days while in group B patients it was 2.12 ± 0.73 days. This difference was also not statistically significant (p-value 0.10) (Table 3).

Post-operative nausea and vomiting were also seen in both the groups. In group A, 20 out of 65 patients (30.8%) had nausea and vomiting while only 6 patients out of 65 patients (9.2%) had nausea and vomiting. This difference is statistically significant (p-value 0.01) showing more nausea and vomiting in group A patients (Table 4).

Table 1: Demographic data

Parameters	Group A		Group B		P-value
Age (years)	29.39±16.32		34.18±18.05		0.15
Gender	N (65)	%	N (65)		
Male	29	44.6	33		50.8
Female	36	55.4	32		49.2

Table 2: Post-operative wound infection

Parameters	Group A	Group B	P-value
Superficial surgical site infection	5 (7.7%)	4 (6.2%)	0.11
Deep tissue infection	1 (1.5%)	0 (0.0%)	
Total	6 (9.2%)	4 (6.2%)	

Table 3: Length of hospital stay

Hospital stay	Group A	Group B	P-value
No. of days	2.28±0.89	2.12±0.73	0.10

Table 4: Post-operative nausea & vomiting

Nausea & vomiting	Group A (n=65)		Group B (n=65)		P-value
	No.	%	No.	%	
	20	30.8	6	9.2	0.01

DISCUSSION

Appendectomy is a very basic operation and most of the patients tolerate this procedure very well especially when it is not a complicated appendicitis. Patients are usually discharged on 1st or 2nd post-operative day. Post-operative nausea and vomiting can be multifactorial. It could be due to anesthesia drugs, analgesics or due to antibiotics¹².

In our study we have seen that nausea and vomiting is seen in both the groups. In group A, Metronidazole is given and the nausea and vomiting is significantly high while in group B, Metronidazole is not given and nausea and vomiting is significantly

less but still there are cases possibly due to anesthesia drugs or narcotic analgesics. In group A, majority of the patients having Metronidazole that is 45 patients didn't had nausea and vomiting showing that it is well tolerated by many patients but still patient having this side effect are not less i.e. 20 patients.

This side effect of Metronidazole does make patients in an agony and discomfort state but practically it does not increase total length of hospital stay as we have seen in our study. The reason behind this fact is that whenever nausea and vomiting occurs we immediately stop the drug and give anti-emetics which solve the problem. Hospital stay increases whenever there is wound infection and patient had to be hospitalized for antibiotic therapy.

We have seen that wound infection rate is almost same in both the groups. Metronidazole literally didn't decrease the wound infection rate in our study. These results are also seen in some of the previous studies done on same issue¹³. Few studies also had opposite results to ours. In these studies, Metronidazole does decreases the wound infection rate^{14,15}. The possible explanation could be other causes of wound infection like immune-compromised states of patients, surgery by junior surgeons, improper hemostasis etc.

There were some limitations of the study. Causes of nausea and vomiting other than Metronidazole were not checked in this study which could alter the results. Perforated appendix cases if included could give more elaborated results regarding efficacy of Metronidazole against anaerobes. Follow up was only for 7 days, longer follow up could have unrevealed more cases of wound infection which could have altered the results.

CONCLUSION

Metronidazole is an effective drug against anaerobes but in simple cases of non-perforated appendicitis, in which bacterial load is less, this drug does not decreases the wound infection rate after appendectomy. Instead it causes more nausea and vomiting which is quite disturbing for the patient so it should be omitted from the post-operative drug regimen after appendectomy.

Conflict of interest: Nil

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