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# Comparative study of single dose preoperative antibiotics versus both preoperative and postoperative antibiotics in appendicectomy for nonperforated appendicitis

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## Abstract

**Background:** The aim of the study is therefore to study the efficacy of single dose preoperative antibiotics versus both preoperative and postoperative antibiotics in reducing surgical site infection after appendicectomy for uncomplicated nonperforated acute appendicitis

**Methods:** This randomized control prospective study conducted on cases of uncomplicated acute appendicitis undergoing appendectomy were included in this study.

**Results:** All the patients with wound infection were superficial surgical site infections detected on 3 rd -5 th postoperative day and managed by daily normal saline dressings, swab for culture and sensitivity was sent though empirical treatment was given with antibiotics like Amoxicillin Potassium Clavulanate, Metronidazole orally. Wound infection in all cases resolved within 4-6 days and healed by secondary intention. No deep incisional or organ space infection or intraabdominal abscess was found in this study. There was no perioperative mortality. The mean duration of postoperative hospital stay was 3.52±1.05in group A and in group B was 4.25±1.25 and the difference was found to be significant

**Conclusion:** Single dose prophylactic preoperative antibiotics would be sufficient in cases of appendicectomy for simple uncomplicated nonperforated acute appendicitis. Postoperative antibiotic administration would not be necessary in these cases.

**Keywords:** Wound infection, Antibiotic, Acute appendicitis.

## Introduction

Appendicitis is the most common intra-abdominal condition requiring emergency surgery, with a lifetime risk of 6%[1]. Appendicectomy continues to be one of the commonest procedures in general surgery, accounts for approximately 1% of all surgical operation[2-3]

The efficacy of antibiotic prophylaxis in patients undergoing appendectomy has been examined in several randomized and observational studies showing that appropriate use of antibiotics reduces the risk of SSI following appendectomy by 40-60%[4] These antibiotics are continued in postoperative period with

different courses and combinations according to each case.[4,5]

The aim of the study is therefore to study the efficacy of single dose preoperative antibiotics versus both preoperative and postoperative antibiotics in reducing surgical site infection after appendicectomy for uncomplicated nonperforated acute appendicitis.

**Material and Methods**

This is a prospective study conducted on patients with simple uncomplicated nonperforated acute appendicitis above 18 years of age undergoing appendicectomy were included in the study.

**Inclusion Criteria**: All patients aged 10-60 years undergoing emergency open appendectomy for acute uncomplicated appendicitis.

**Exclusion Criteria**: The following patients were excluded from the study

1. Complicated appendicitis cases (appendicular mass, gangrene, perforation and abscess).
2. Patients with pregnancy
3. Patients with other co morbidities like immune compromised state, diabetes, carcinoma and patients on steroids.
4. Co morbid conditions requiring antibiotics.
5. Patients who had received antibiotics within 72 hours of admission
6. History of symptoms more than 3 days
7. Cases lost to follow up
8. Allergic to the respective antibiotics
9. Refused to give consent

A detailed history was taken and thorough clinical examination was done in each case. Clinical diagnosis of acute appendicitis was made based on history and physical examination. All necessary investigations were done including ultrasound abdomen. Patients were considered to have simple uncomplicated nonperforated acute appendicitis when the symptoms were less than 48 hours duration and no evidence of perforation on imaging and intraoperative findings as mentioned in literature though final confirmation was obtained by histopathological examination.

All necessary uniform guidelines of aseptic precautions and management were followed. Operative area was cleaned with Povidone iodine and surgical spirit. The duration of symptoms was recorded from time of onset of symptoms according to the patient until surgery.

Patients were given single dose of prophylactic preoperative antibiotics intravenously Cefotaxime (1gm) and Metronidazole (500 mg) half an hour before skin incision for port placement. Appendicectomy was done using three port technique, one 10 mm port subumbilicus and two 5mm ports at suprapubic and left lower quadrants. Mesoappendix was resected with electrocautery. Appendix was ligated with chromic catgut endoloop and removed from umbilical trocar site which is then closed with 2-0 Vicryl and skin with 3-0 Ethilon.

No drain was inserted in these cases. Patients with nonperforated appendicitis diagnosed intraoperatively were randomly allocated by opening sealed envelopes into two groups, Group A and Group B.

Group A patients were given single dose of prophylactic preoperative antibiotics intravenously Cefotaxime (1gm) and Metronidazole (500mg) half an hour before skin incision for port placement. No further antibiotics were given in Group A. Group B patients were given single dose of prophylactic preoperative antibiotics intravenously Cefotaxime (1gm) and Metronidazole (500mg) half an hour before skin incision for port placement and were given further one dose of Cefotaxime (1gm) and two doses of Metronidazole (500mg) intravenously within 24 hours

after surgery, further doses of Cefotaxime (1 gm) 12th hourly and Metronidazole (500 mg) 8 th hourly intravenously were given over next 24 hours. Then these participants in group B were given antibiotics Tab Cefpodoxime (200mg) 12th hourly and Tab Metronidazole 400 mg 8 th hourly orally for 5 days. No blinding was done during the study.

Appendix specimen was sent for histopathological examination. Primary outcome was surgical site infection. Patients were monitored in postoperative period. Temperature chart was maintained. Wound dressing was opened after 48 hours and examined for any signs of surgical site infection as defined by Centers For Disease Control and Prevention (CDC) with features of erythema, local edema, fever or discharge of pus that requires surgical drainage. Patients were discharged when they were afebrile (less than37.5 degrees Celsius), had no signs of wound infection, fully mobilized, could tolerate normal oral diet following return of bowel activity, had adequate pain relief with oral analgesics. If patient was discharged, follow up was done on 5 th postoperative day. Suture removal was done on 7 th postoperative day. In cases of wound infection, swab for culture and sensitivity was sent to microbiology lab. Further follow up was done in all cases for a minimum period of 30 days. Secondary outcome was duration of postoperative hospital stay.

**Statistical analysis**

Statistical analyses were done using IBM SPSS Statistics version 17.0. Values were presented as mean ± standard deviation or percentages. ANOVA Test was used. Fisher's Exact test and Chi-square test were used wherever necessary. p value of less than 0.05 was considered statistically significant.

**Results**

Table 1: Socio-demographic variable

| Variable | Group-A | Group-B | p-value |
|---|---|---|---|
| Age in Yrs | 22.65±3.52 | 23.12±3.25 | 0.254 |
| Male : female | 18:12 | 19:11 | 0.99 |
| BMI in kg/mt$^2$ | 22.39±2.14 | 22.10±2.58 | 0.581 |

Both groups were comparable.

Table 2: Comparison of type of wound infection between two groups

| Variable | Group-A | Group-B | p-value |
|---|---|---|---|
| Superficial incisional SSI | 1(3.33%) | 2(6.67%) | 0.99 |
| Deep incisional SSI | 0 | 0 | |
| Hospital stay in days | 3.52±1.05 | 4.25±1.25 | 0.01 |

All the patients with wound infection were superficial surgical site infections detected on 3 rd -5 th postoperative day and managed by daily normal saline dressings, swab for culture and sensitivity was sent though empirical treatment was given with antibiotics like Amoxicillin Potassium Clavulanate, Metronidazole orally. Wound infection in all cases resolved within 4-6 days and healed by secondary intention. No deep incisional or organ space infection or intraabdominal abscess was found in this study. There was no perioperative mortality. The mean duration of postoperative hospital stay was 3.52±1.05in group A and in group B was 4.25±1.25 and the difference was found to be significant

**Discussion**

Surgical site infection is most common complication after appendicectomy. Standard criteria for surgical site infection were defined by Centres For Disease Control and Prevention (CDC).[5.6]

Antimicrobial prophylaxis is recommended in clean contaminated cases.Prophylactic antibiotic is effective when administered at appropriate time and dosage before incision so that therapeutic tissue levels are reached.[7]

In this study, there was no statistically significant difference in the rate of surgical site infection in Group A and Group B. Similar findings were observed in studies by Choi et al, Le et al.[8,9] In this study there was no significant difference in wound infection with respect to age and gender and this was also found in Choi et al study.[8]

In this study, the mean duration of postoperative hospital stay was longer in group B than in group A and the difference was statistically significant. Similar finding was observed in Choi et al, Coakley et al studies.[8,10] But there was no significant difference in postoperative hospital stay between both groups in Hussain et al study.[11] There are not many studies that studied the efficacy of single dose prophylactic antibiotics in patients undergoing laparoscopic appendicectomy only as most of the studies included open or both open and laparoscopic procedures together. So, this study has included only laparoscopic appendicectomy cases for better understanding of the efficacy of single dose prophylactic antibiotics in these cases.

**Conclusion**

Single dose prophylactic preoperative antibiotics would be sufficient in cases of appendicectomy for simple uncomplicated nonperforated acute appendicitis. Postoperative antibiotic administration would not be necessary in these cases.

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