



COMPARISON OF SINGLE DOSE PREOPERATIVE ANTIBIOTICS VERSUS BOTH PREOPERATIVE AND POSTOPERATIVE ANTIBIOTICS IN APPENDICECTOMY FOR NONPERFORATED APPENDICITIS

General Surgery

Dr. Sunil Kumar

Junior Specialist, General Surgery, Government Medical College, Barmer, Rajasthan.

Dr. Manish Choudhary*

Assistant professor, General Surgery, Government Medical College, Barmer, Rajasthan.
*Corresponding Author

ABSTRACT

Background- Appendicitis is the most common intra-abdominal condition requiring emergency surgery. 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 appendectomy 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- There was no perioperative mortality. The mean duration of postoperative hospital stay was 3.51 ± 1.03 in group A and in group B was 4.22 ± 1.21 and the difference was found to be Insignificant

Conclusion- Single dose prophylactic preoperative antibiotics would be sufficient in cases of appendectomy 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. Appendectomy 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 appendectomy 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 appendectomy were included in the study.

INCLUSION CRITERIA-

All patients aged 18-60 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.

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. Appendectomy 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 than 37.5 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.

RESULTS

Table 1. Socio-demographic variable

Variable	Group-A	Group-B	p-value
Age in Yrs	23.12 $\pm$ 3.18	23.16 $\pm$ 3.19	>0.05
Male : female	17:13	18:12	>0.05

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 3.51±1.03 in group A and in group B was 4.22±1.21 and the difference was found to be Insignificant

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.

REFERENCES

1. Wei PL, SP Keller JJ. Volume -outcome relation for acute appendicitis: evidence from a nation wide population based study. *Pos One* 2012;7:e52539
2. Stephens PL, Mazzucco JJ. Comparison of ultrasound and the alvadro score for the diagnosis of acute appendicitis. *Conn Med* 1999;63:137-40
3. Wang HT, Sax HC. Incidental appendectomy in the era of managed care and laparoscopy. *J Am Coll Surg*. 2001;192:182-188.
4. Omundsen M, Dennett E. Delay to appendicectomy and associated morbidity: a retrospective review. *ANZ J Surg*. 2006;76(3):153-155.
5. Shrivastava UK, Gupta A, Sharma D. Evaluation of the alvadro score in the diagnosis of acute appendicitis. *Trop Gastroentero* 2014;25:184-6
6. Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR. Guideline for prevention of surgical site infection, 1999. Hospital infection control practices advisory committee. *Infect Control Hosp Epidemiol*. 1999;20(4):250-78.
7. Centers for Disease Control and Prevention, National Healthcare Safety Network. Surgical Site Infection (SSI) Event. January 2015 (Modified April 2015). Available at <http://www.cdc.gov/nhsn/pdfs/psemanual/9pscscsirent.pdf>.
8. Choi SM, Lee SH, Jang JY, Kim HW, Jung MJ, Lee JG. Is single administration of prophylactic antibiotics enough after laparoscopic appendectomy for uncomplicated appendicitis? *J Acute Care Surg*. 2015;5:59-63.
9. Le D, Rusin W, Hill B, Langell J. Post-operative antibiotic use in nonperforated appendicitis. *Am J Surg*. 2009;198(6):748-52.
10. Coakley BA, Sussman ES, Wolfson TS, Bhagavath AS, Choi JJ, Ranasinghe NE, et al. Postoperative antibiotics correlate with worse outcomes after appendectomy for nonperforated appendicitis. *J Am Coll Surg*. 2011;213(6):778-83.
11. Hussain MI, Alam MK, Al-Qahatani HH, AlAkeely MH. Role of postoperative antibiotics after appendectomy in nonperforated appendicitis. *J Coll Physicians Surg Pak*. 2012;22(12):756-9