



EVALUATION OF TWO VERSUS FIVE DAYS COURSES OF ANTIBIOTICS IN NON PERFORATED POST APPENDECTOMY CASES

General Surgery

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ABSTRACT

Acute appendicitis (AA) is one of the most common acute surgical illnesses with a lifetime prevalence of AA is approximately 7%. Although there are evidence suggesting various post operative antibiotics regimen for appendicectomy to prevent infective complications in non perforated appendicitis. Hence, the present study was conducted with the aim of evaluating and comparing the outcomes of two versus five days courses of post operative antibiotics (3rd generation Cephalosporin, Amikacin & Metronidazole) in non-perforated post appendectomy cases. Prospective, observational study was conducted at Sri Siddhartha Medical College and Research Institute, Tumkur, Karnataka from 1st Jan 2021 to 30th June 2022 on 58 patients, 29 each in two groups diagnosed with non perforated appendicitis & posted for appendicectomy. One group was administered with two days of antibiotics (Group A) and the other for five days (Group B) post operatively. There was no significant difference in the demographic details between two groups. Both the groups had almost similar duration of surgery. 22/29 (75.9%) and 7 (24.1%) of the patients had been hospitalized for up to 5 days and >5 days respectively in Group A but it was in order to complete the course of antibiotics. We did not observe any major differences between two groups with respect to postoperative complications. Post operative two days antibiotic regimen is equivalent to the five days regimen. Hence, we suggest that two days intravenous antibiotic could be sufficient to avoid infective postoperative complications of appendectomy in non perforated appendicitis.

KEYWORDS

Appendicectomy, Acute non perforated appendicitis, Five days and two days antibiotic regimen, Post appendectomy antibiotic regimen, post appendectomy complications.

INTRODUCTION

Acute appendicitis (AA) is one of the most common acute surgical illnesses and one in every 1,00,000 people is infected with AA [1-3]. Intraoperatively, AA is classified either as simple or complex appendicitis. A simple appendicitis is a suppurative or phlegmonous appendicitis with or without extramural pus. A complex appendicitis includes a gangrenous appendicitis, a perforated appendicitis and/or appendicitis with abscess formation [4]. The definitive treatment of AA is surgery. Appendectomy is carried out either by means of an open incision or via laparoscopy. Medical management before and after the surgery has an important impact on the treatment [1-3].

Although the mortality is low, complications like surgical site infection (SSI), intra abdominal abscess (IAA) are frequent. The microbes associated with appendicitis, gram negative enteric bacteria, aerobic flora of skin may cause postoperative infection depending on the degree of inflammation of appendix, surgical technique and duration of operation [1,3]. Despite improved asepsis and surgical techniques, postoperative infections still account for morbidity, longer hospital stays and increased cost of treatment. Moreover, there is an escalating problem with antibiotic resistance among bowel pathogens [5], with an increased rate of antibiotic resistant bacteria. Even after a short course of antibiotic therapy, extended- spectrum beta-lactamase (ESBL) resistance has been found with increased costs, prolonged hospitalization, and increased mortality [6].

At a time when antimicrobial resistance is an increasingly urgent global health threat, the use of antibiotics should be minimized where possible. Resistance is a natural biological outcome of antibiotic use. Antibiotic overtreatment, however, increases the speed of emergence and selection of resistant bacteria [7,8]. The use of a two days dose of post operative antibiotics may decrease the frequency of SSI, IAA formation, unnecessary cost of long term antibiotics, minimize development of multiple drug resistant bacteria and also length of hospital stay. Cephalosporins have an extended spectrum antibacterial effect against gram positive cocci and gram negative enteric bacteria and are the most commonly utilized antibiotics in prophylaxis and treatment [1,3,4].

AIM & OBJECTIVES:

To evaluate and compare the outcomes of two days versus five days courses of post-appendectomy antibiotics on preventing infective complications in non-perforated appendicitis.

MATERIALS AND METHODS

Prospective observational study was done for a duration of 18 months in participants who underwent appendectomy in Sri Siddhartha Medical College Hospital and Research Centre, Tumkur.

Inclusion Criteria

- All participants aged >18 years of both genders were confirmed with acute appendicitis on ultrasonography abdomen or Computed Tomography and underwent appendectomy.
- The participants willing to participate in the study were included.

Exclusion Criteria

1. participants with generalised peritonitis.
2. participants who are immunocompromised.
3. participants with comorbid factors like Diabetes, HIV-AIDS, on long term steroids.
4. participant not willing for surgery.
5. participants with appendicitis in pregnancy or lactating.
6. acute perforated appendicitis.
7. known allergy or other contraindication to study medication

METHODOLOGY:

After obtaining the ethical committee clearance, 58 participants meeting the above mentioned inclusion criteria were recruited for the study. All participants had received a dose of prophylactic antibiotics before appendectomy. Participants were grouped (1:1) to receive either: **Group A** - A short course of two days or **Group B** - Five-day course of the same postoperative antibiotic treatment (Cefoperazone + Amikacin + Metrogyl). No other antibiotics are permitted and if required, those subjects were supposed to be removed from the study but none of our participants had required any other antibiotic.

Antibiotic treatment was planned to be prolonged or restarted only in case of a proven source of infection. A switch to a different antibiotic regimen was allowed only if necessary due to an adverse reaction to the antibiotics or if the pus culture was insensitive to cefoperazone and amikacin. After discharge a standard outpatient visit was planned after 1 week and 4 weeks. participants were instructed to visit if they have any problems before or even after these follow up periods. The endpoints of this research were infectious complications related to appendectomy, including erythema, seroma, SSI, IAA, postoperative fever due to SSI, duration of antibiotic treatment and duration of hospital stay.

RESULTS

We had included 29 participants each in the treatment of antimicrobial agents for the duration of two days and five days respectively. Group A represents the participants who had treated with antimicrobial agents for two days and Group B represents those who had treated for five days. All the demographic details and the other parameters had been compared between the two groups and had been represented as the tables and graphs below.

Table 1: Distribution of age

Age in years	Group A	In %	Group B	In %
20 to 30	2	6.9%	1	3.4%
31 to 40	12	41.4%	13	44.8%
41 to 50	10	34.5%	9	31.0%
51 to 60	4	13.8%	5	17.2%
>60	1	3.4%	1	3.4%
Average age	33.42±4.5 years		34.21±6.3 years	
P value	0.48			

The above table represents the frequency distribution of age between the two groups. The average age among the participants in Group A and B were 33.42±4.5 years and 34.21±6.3 years respectively, with no significant difference.

We can observe that in group A, 12/29 (41.4%) followed by 10 (34.5%) were aged between 41 to 50 years. Similarly in Group B, 13 (44.8%) were aged between 31 to 40 years followed by 9 (31%) of them between 41 to 50 years. Rest of the population were widely distributed with lesser incidence. By this we could observe that the incidence of appendicitis and the rate of appendectomy is most common in the adult age group.

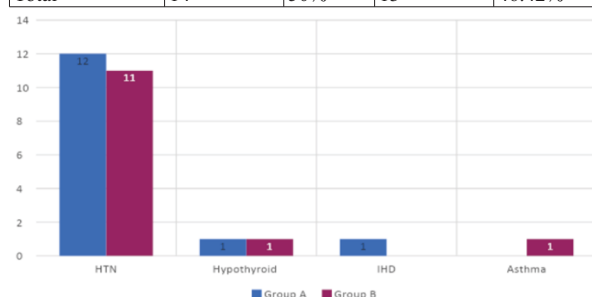
Table 2: Distribution of gender

Gender	Group A	Group B
Male	16 (55.2%)	17 (58.6%)
Female	13 (44.8%)	12 (41.4%)

In group A, out of 29 participants, 16 (55.2%) were males and 13 (44.8%) were females. Also, in Group B, 17 (58.6%) and 12 (41.4%) were males and females respectively. We could observe that there was no significant difference in the distribution of intra as well as inter group gender distribution.

Table 3: Distribution of comorbid conditions

Comorbidity	Group A	In %	Group B	In %
HTN	12	41.4%	11	37.9%
Hypothyroid	1	3.6%	1	3.6%
IHD	1	3.6%	0	-
Asthma	0	-	1	3.6%
Total	14	50%	13	46.42%



Graph 1: Distribution of comorbid condition

19/29 (65.5%) of the participants in Group A were presented with known comorbid conditions. Of these 19 participants 12 and 1 of them were suffering from HTN and other than HTN and respectively. One each in Group A were suffering from hypothyroidism and IHD. Whereas one each in group B were found to be hypothyroid and asthmatic. No other comorbidities were observed in the participants.

Table 4: Duration of surgery

Groups	Average duration in minutes
A	52.84±15.1
B	51.37±12.3
P value	0.69

The above table mentions the average duration of surgery. We can observe that the average duration of surgery in Group A was 52.84±15.1 minutes and in group B it was 51.37±12.3 minutes. There was no statistically significant difference in the average duration of the surgery between two groups.

Table 5: Duration of hospital stay

Duration in days	Group A	In %	Group B	In %
Up to 5 days	22	75.9%	--	--
>5 days	7	24.1%	29	100%

The above table explains that 22/29 (75.9%) and 7 (24.1%) of the participants had hospitalised for up to 5 days and >5 days respectively in Group A. Whereas in Group B, all the participants have to hospitalised for at least 5 days in order to complete the course of antimicrobial agents.

Table 6: Post operative complications

Variables	Group A 2 Days dose	Group B 5 days Dose	Chi Square test p-Value & Sig.
	Numbers (%)	Numbers (%)	
Fever	1	1	p- Value > 0.05 NS
Erythema	Nil	1	p- Value > 0.05 NS
Seroma	Nil	Nil	p- Value > 0.05 NS
Separation of Deep Tissues	Nil	Nil	p- Value > 0.05 NS
IAA	Nil	Nil	p- Value > 0.05 NS
Evidence of SSI after 1 week	Nil	Nil	p- Value > 0.05 NS
Evidence of SSI after 4 weeks	Nil	Nil	p- Value > 0.05 NS

From the above table, we can assess that only one participant in Group A had fever and one participant in Group B had fever and local erythema. We did not observe any major complications between two groups with respect to postoperative complications.

DISCUSSION

Majority of the guidelines recommend postoperative antibiotics for complex appendicitis but there is no consensus on the duration of postoperative antibiotic treatment regimens. We could find evidence suggestive of antibiotic therapy for the duration of two days till five days of post operative period. Few studies suggest two to three days of IV antibiotics followed by another three days of oral. Whereas we also observed few more clinical data suggesting almost five days of IV antibiotics. Hence, we conducted a study to analyze the outcome of two versus five days of postoperative antibiotic regimen.

We had excluded the participants with known case of diabetes as we came across the evidences suggesting that the participants with diabetes and no significant comorbidities have a higher risk of developing SSIs and longer hospital stay than participants without diabetes.⁹

We did not observe any correlation between the comorbidity and the postoperative complications, as our participants were non diabetics and controlled hypertensives.

In Group B, all the participants have to hospitalised for at least 5 days in order to complete the course of antimicrobial agents.

We did not observe any major complications between two groups with respect to postoperative complications. **Rossem CV et al** had reported 23.4% of the participants developed post appendectomy complications in their study.¹⁰

We could analyze that there is no need for prolonged antibiotic therapy for more than two days. Similar to our study, **Kim IK et al** also suggested that short-course antimicrobial therapy is valuable to be considered in critically ill participants with postoperative intra-abdominal infections (IAIs).¹¹ **Boom et al** was another double blinded randomized trial which suggested that two days course of post operative antibiotic is non inferior to the five days course of antibiotic

therapy.¹² Unlike our study **Rossem CV et al** who had compared between three day versus five days antibiotic therapy also reported that 3 days of antibiotic treatment is equally effective as 5 days in reducing postoperative infections.¹³ We had even come across the studies in which the prophylactic/preoperative single dose antibiotic was enough to control the postoperative complication and there was no appreciable benefit of post operative antibiotics in uncomplicated appendicitis cases.¹⁴

We observed that as there are very less number of clinical studies which has compared the two days versus five days of postoperative antibiotic regimen, our clinical observations stand as the strong evidence that, when the participants have been operated for non-perforated appendicitis, two days antibiotic therapy could be as good as five days therapy. Also, five days therapy might be just prolonging the hospitalisation and the cost of treatment as well as the resource consumption along with serving its purpose.

CONCLUSION

Post operative two days antibiotic regimen is equivalent to the five days regimen. Hence, we suggest that two days of intravenous antibiotic could be sufficient to avoid the postoperative complications of appendectomy in cases of acute non perforated appendicitis.

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