

Effect of Third Generation Cephalosporin Single Dosage Vs Multiple Dosage in Case of Emergency Open Uncomplicated Appendicectomy

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How to cite this article:

Chandan C.S., Sudarsan S., Mohan Kumar. Effect of Third Generation Cephalosporin Single Dosage Vs Multiple Dosage in Case of Emergency Open Uncomplicated Appendicectomy. *New Indian J Surg.* 2018;9(3):296-61.

Abstract

Appendicitis remains as the disease encountered by practising surgeon. It is the most common urgent or emergent general surgical operation performed. This remains as sole reason for 300,000 hospitalizations yearly [1] upto fourteen different organisms are found in patients with perforated appendicitis. E.coli and Bacteroides fragilis are the common organisms encountered in perforated appendicitis [2].

Our study is a prospective study which included 150 patients which were made into two groups one study and one control group where single dose and multiple doses of third generation cephalosporin were given and wound grading was done with southhamtom score. In our study with evidences available it is clear that extra doses of cefaperazone and sulbactam confer no extra advantage, as single dose can be given with much ease and offers reduced financial burden for the patient. The hospitals should make routine antibiotic protocols and keep changing it time to time in order to reduce antibiotic reistance in the current era of super bugs it is the duty of the surgeon to comply with the current standards of antibiotic care in order to reduce the complications regarding the drug resistance and complication regarding the wound infection.

Keywords: Uncomplicated Appendicitis; Third Generation Cephalosporin; Single Dose; Multiple Dose.

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Received on 04.03.2018, Accepted on 23.04.2018

Introduction

Appendicitis remains one of the most common diseases faced by the surgeon in practice. It is the most common urgent or emergent general surgical operation performed in the United States and is responsible for as many as 300,000 hospitalizations annually [1]. Appendicitis is a polymicrobial infection, with some series reporting up to 14 different organisms cultured in patients with perforation. The principle organisms seen in normal appendix, in acute appendicitis, and in perforated appendicitis are Escherichia coli and Bacteriodes fragilis [2].

Most patients with acute appendicitis are managed by prompt surgical removal of the appendix. Increased hospital stay and disease morbidity and financial strain are directly proportional to post operative surgical site infection post surgery. There is increased chance of wound infection in perforated appendicitis when compared to non perforated ones. There are several studies stating the need of usage of antibiotics the method of uage and quantity to be administered [2]. Antibiotics should be administered 30 minutes prior to incision to achieve adequate tissue levels. In non-perforated appendicitis one dose prior to surgery is enough. In cases of perforation, an extended course of atleast 5 days of antibiotics is advocated. This prospective study is designed to compare the outcome of usage of antibiotic single dose cefaperazone sulbactam vs multiple doses in cases of emergency open uncomplicated appendicectomy [3].

Aims & Objectives

To know the outcome of single dose antibiotic— (cefaperazone sulbactam) in cases of emergency open uncomplicated appendectomy.

To compare single dose (cefaperazone sulbactam) with – multiple doses of antibiotics in case of emergency open uncomplicated appendectomy.

Consent was taken from all the patients. The pre study clearance from ethical committee pertaining to the hospital was taken .

Materials and Methods

Duration: JAN 15th 2017 TO SEP 15th 2017

Study Design: Prospective study

Sample Size: 150.

Inclusion Criteria

Patients presenting with clinical features suggesting of – acute appendicitis - anorexia, right iliac fossa pain, nausea, vomiting and fever are included in the study.

Exclusion Criteria: Patients with perforated appendicitis, appendicular abscess, appendicular mass formation.

Methodology

Patients presenting with clinical features suggesting of acute appendicitis- anorexia, right iliac fossa pain, nausea, vomiting and fever admitted in emergency department of our hospital from the above mentioned period will be enrolled in our study.

Emergency open appendicectomy was planned for the patients. Prior to performing surgery patients were divided into two groups, on random allocation . Group 1 patients were administered with single dose of cefoperazone sulbactam 1.5 gm prior to administration of anaesthesia. group 2, two further doses of cefoperazone and sulbactam every 12 hours for 3 days of were given intravenously

Open surgical Appendicectomy was performed in all the patients surgical. layer by layer closure of wound was done. on day to day basis postoperative monitoring of wound was done and was graded with south Hampton scoring system grade on appearance of wound .

Southampton Scoring System Grade Appearance of Wound

S. No	Parameters	Score
1	Normal Healing –	0
2	Normal Healing With Bruising`	1
3	Normal Healing With Erythema	2
4	Clear Discharge	3
5	Purulent Discharge	4
6	Deep Wound Infection	5

Study Parameters

Demographic data- age and sex Age wise distribution of infected/non infected in Test (group 1) and Control (group 2) cases Grade of wound infection Length of hospital stay Observations are tabulated and the results are analyzed using Microsoft Excel for tabular transformation and graphical representation. For comparing the parameters and statistical analysis, 2-sample z-test are used.

Observation and Results

In our study patients were randomly allocated in to two groups for the total of 150 patients as 75 in each group. The range of patients came under the age group of 11-45 , 20.9 years mean age in group 1 and 24.1 years in group 2 (Table 1, 2 &3).

The total number of cases who developed post-operative infection is 13 with the peak incidence of infection being in the 4th decade of life.

The median hospital stay in the test and control group was around 5 days .

Southampton scoring system was applied and used and wounds following surgery were graded and grouped accordingly for evaluation-

Table 1: Age wise distribution

Age group	Number of cases	Percentage %
11-20	64	42.67
21-30	57	38
31-40	27	18
41-50	2	1.33
51-60	NIL	NIL

Table 2: Sex wise distribution

Age group	Male	%	Female	%2
11-20	36	24	28	18.67
21-30	25	16.67	32	21.33
31-40	12	8	15	10
41-50	2	1.33		

Table 3: Age wise distribution of infection

Age group	Total no. of cases	No. of cases infected	Percentage
11-20	64	Nil	0
21-30	57	2	1.33
31-40	27	9	6
41-50	2	2	1.33
51-60	Nil	Nil	
Total	150	13	8.66

	Test group	Control group
Total No. of Cases	75	75
No. of Cases infected	7	6
Infection Rate	9.33	8%

- In the study, total of 75 patients were male and 75 were female with the age group in 2nd and 3rd decade being the most number of cases
- The total number of cases who developed post-operative infection is 13 with the peak incidence of infection being in the 4th decade of life.
- Of the 13 cases who developed infection post-operatively 7 (9.33%) of them belonged to the study group and 6 (8%) of them belonged to control group
- (84%) patients showed normal wound healing in group 1 (85.3%) in the other group.
- 5 out of 75 patients showed signs of minimal wound infection (6.6%) in group 1 and 5 of 75 (6.6%) patients belonging to group 2.
- 7 patients in group 1 and 6 patients in group 2 had pus discharge
- No patients in either group developed grade 5 wound infection.

Using 2 sample z-test for analysis, no statistically significant value was noted between study and control groups. The length of hospital stay in both the groups were almost similar.

Discussion

In open surgical appendicectomy there is need for antibiotics for wound cover and in order for control of infection. Several studies quote the usage of unnecessary excessive doses of antibiotics [4].

Adequate antibiotic cover and regimen is needed for complicated cases of appendicitis as these groups require utmost care. Antibiotic for prophylaxis choice is different in different centres and even among the different surgical units attached to the same Institute.

How ever there is no clear cut guidelines on usage of antibiotics in non complicated cases. several studies opine that single dose of antibiotic is far superior than successive doses post surgery.

In a study conducted by mui et al it is evident that single dose of antibiotic can tackle the necessary post operative complications in comparison to successive doses post surgery

They concluded that adding excessive doses increased the financial burden for the patients.

In our study, we have used the Southampton scoring system, a more objective method to assess the progress of the surgical wounds by correlating with the wound

site [5] statistical significance in post operative wound infection was not noted in both the groups. the data were in accordance with literature [6].

- Escherichia coli and Bacteriodes fragilis causing post appendicectomy sepsis can be tackled with Cefaperazone sulbactam which was chosen in our study as it was amongst available cephalosporins which has very good antibacterial spectrum for pathogens.
- This choice of antibiotic is in line with the recommendations given by the ASHP [7,8]. As per the study there was no difference in length of stay in hospital
- Several studies state that improper of choice of antibiotics leads to postoperative complications in terms of sepsis and delayed hospital stay. In a study by cockley et al it is evident that several successive doses of antibiotics didnot reduce the complications.
- In fact, their study showed significantly increased rate of adverse effects like Clostridium difficile infection, diarrhea, longer length of hospital stay and higher treatment cost [9]. Readmission and reoperation rates were higher in patients receiving several successive doses of post operative antibiotics.

The advantage of giving single dose prior to anaesthesia is surgeon can be sure that wound prophylaxis is taken care and further doses need not be monitored. reducing the further intravenous dosages brings down the financial burden and reduces the hospital stay [10].

Conclusion

It is clear and evident from our study and prove beyond doubt that several successive doses of antibiotic confer no additional advantage. Single dose of antibiotic is the drug of choice in non complicated acute appendicitis.

In the era of superbugs is the duty of the surgeon to comply with the current standards of antibiotic care in order to reduce the complications regarding the drug resistance and complication regarding the wound infection.

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