ROLE OF SIGNAL DOSE PREOPERATIVE ANTIBIOTIC IN ACUTE NONPERFORATED APPENDICITICS

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ABSTRACT

Objective: To determine the efficacy of a single dose of preoperative antibiotic in preventing post operative infective complications in patients undergoing appendicectomy for non perforated acute appendicitis.

Study Design: Randomized controlled trials.

Place and Duration of Study: Surgical unit I and II, department of General Surgery, Combined Military Hospital (CMH) Lahore from 1st June to 31st October 2010.

Patients and Methods: Seventy patients with acute appendicitis scheduled for appendicectomy were included in the study and randomly divided into two groups of 35 each using random numbers table. Group A received single dose preoperative antibiotic and group B received three-dose regimens of cefuroxime. Postoperative infective complications were the primary endpoint.

Results: The rate of postoperative wound infection was not statistically insignificantly different among the groups; (8.57%) group A and (5.71%) group B at 1st post operative week and (5.71%) group A and (5.71%) group B at 2nd post operative week. None of the patients from either group showed any signs of intra abdominal abscess formation.

Conclusion: Single dose of preoperative antibiotics is adequate for prevention of postoperative infective complications in patients with non-perforated appendicitis undergoing open appendicectomy.

Keywords: Appendicectomy, Acute appendicitis and Cefuroxime.

INTRODUCTION

The clinical condition of appendiceal inflammation followed by perforation, abscess formation, and peritonitis was first described in 1889 by Reginald Fitz[1]. Acute appendicitis is the most common cause of acute surgical abdomen and appendicectomy is the most frequently performed emergency operation.[2] The diagnosis of acute appendicitis is predominantly a clinical one[3]. Appendicectomy is the treatment of choice and is increasingly done as a laparoscopic procedure[4]. The morbidity and mortality associated with acute appendicitis has diminished over time[5]. Since it usually affects young healthy people, the overall effect on our work force remains significant[6]. Infection of the operative incision is the most common cause of morbidity after appendectomy[7]. Therefore, it can result in increased pain and a lengthy hospital stay[8]. Some authors have classified appendicitis on the basis of operative finings; when the appendix has perforated or is gangrenous or if there is abscess formation, they have termed it complicated appendicitis; if these findings are absent then they call it simple appendicitis[9]. Although the role of preoperative and postoperative antibiotic therapy has proven to and intra-abdominal septic complications after selected potentially contaminated operations, the role of such prolong prophylactic antibiotic therapy has not been adequately established to be beneficial in patients undergoing appendicectomies for acute non-perforated appendicitis[10,11]. Traditionally, broad-spectrum antibiotic coverage with multiple drugs has been advocated, although there is no universally accepted regime[12]. There has been a recent trend towards single or dual drug regimes, in order to reduce cost and simplify dosing schedules[13,14]. We conducted this study to establish the role of a single dose of preoperative antibiotic in preventing post operative infective complications in patients under going appendicectomy for non-perforated acute appendicitis and thus avoiding

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unnecessary and prolong administration of costly antibiotics in such patients.

MATERIALS AND METHODS

These randomized controlled trials were conducted in surgical unit I and II, Combined Military Hospital Lahore, from June to October 2010. During this time period, patients of acute appendicitis were enrolled in the study. Criteria for inclusion in the trial included adults and children admitted with a presumptive diagnosis of acute appendicitis and scheduled for appendicectomy. Exceptions to inclusion in the study included children less than 3 months of age, known allergy to cephalosporins or penicillins, antibiotic therapy within 3 days before surgery, pregnancy, serious underlying illness likely to require antibiotic therapy, patients in whom the appendix was found to be ruptured or gangrenous at operation or those with appendicular or peri appendicular abscess. Patients in whom appendix was found to be normal and no other intra-abdominal disease found were also included in the study.

Permission was taken from the ethical Committee CMH and informed consent was taken from the patients. Seventy were included according to the inclusion criteria through non-probability convenience sampling and were randomly divided into two groups of 35 each using lottery method. Hospital registration number of all patients was recorded. A detailed history was taken and clinical examination was carried out. One hour before the start of operation, patients from both groups received a 1.5 G injection of cefuroxime, no further antibiotic was administered to group A patients, however, patients from group B received two more injections of cefuroxime 750mg 8 hourly for 24 hours postoperatively. Operation was performed under general anesthesia by the standard procedure using right lower quadrant muscle splitting incision. Minimal handling of the appendix was ensured. Only absorbable sutures were used except for the skin. If the appendix was found to be ruptured or gangrenous during the operation or if there was evidence of appendicular or peri appendicular abscess, the patient was excluded from the study.

All patients were assessed for wound infection and intra abdominal abscess formation on the 3rd postoperative day and on 1st and 2nd post operative weeks. Redness of and around the wound edges and/or discharge of turbid fluid or frank pus from the wound was considered as wound infection.

Abscess formation was diagnosed by the presence of high grade or swinging fever, abdominal pain, and tenderness on abdominal or rectal examination and if these signs and symptoms were present, confirmed by abdominal ultrasound. All such findings were recorded.

Statistical analysis was performed using SPSS version[14]. Mean and standard deviation(sd) were calculated for numerical variables like the age. Frequency and percentages were calculated for qualitative variables which include gender, wound infection and intra-abdominal abscess formation. Chi square test was used as a test of significance to compare the development of these complications between the two groups. A p value < 0.05 was considered as significant.

RESULTS

A total of 70 patients were included in our study. Average age of group A was 26.67±6.71 years while average age of group B was 27.92±5.36 years(p>0.05). There were 8 (22.8%) femals in group A and 10 (28.6%) females in group B (p>0.05).

The development of wound infection was compared between the two groups (table). On the 3rd post operative day, none of the patients from either group showed any signs of wound infection. The difference between the two groups in terms of wound infection has statistically insignificant at 1st post operative week (p=0.643) as well as 2nd post operative week (p=1.00).

All patients were assessed for the development of intraabdominal abscess on the 3rd postoperative day and on 1st and 2nd postoperative weeks. However, none of the patients from either group showed any signs of abscess formation like high grade or swinging fever, abdominal pain and tenderness on abdominal or rectal examination when

examined on the 3rd postoperative day and on 1st and 2nd post operative weeks.

DISCUSSION

In patients undergoing appendicectomy for uncomplicated acute appendicitis, the incidence of post operative infective complications is generally very low[15,16]. However, it has been observed in our daily clinical practice that these patients are usually subjected to prolonged administration of costly parenteral antibiotics, which is probably unnecessary. We, therefore, conducted this study based upon the hypothesis that a single dose of pre operative broad spectrum antibiotic is as effective as a prolonged course in preventing post operative infective complications.

Table: Comparison of wound infection at 1st and 2nd week.

Wound Infection	Group A (n=35)	Group B (n=35)	*p*-value
At 1st week present absent	3(8.6%) 32(91.4%)	2(5.7) 33(94.3%)	0.643
At 2nd week present absent	2(5.7%) 33(94.3%)	2(5.7%) 33(94.3%)	1.000

We found out that the overall incidence of wound infection in our study was 7.14% in the first week and 5.71% in the second week which is comparable to 5.1% in a study conducted by Busuttil and colleagues at UCLA[17].

We did not find any statistically significant difference between the two groups in terms of post operative wound infection when compared at 3rd post operative day, 1st post operative week and at second week post operatively. Similar outcome was described by Haji Nasrollah and colleagues in their study comparing single with triple dose regimen[18]. In a randomized controlled trial conducted by Mui et al. at the Prince of Wales Hospital, Hong Kong the results were also similar and they concluded that a single dose of preoperative antibiotic is adequate for prevention of post operative infective complications in patients with non-perforated appendicitis undergoing open appendicectomy and prolonging the use of antibiotics can lead to unnecessary antibiotic related complications[19].

None of the patients from either group in our study showed any signs of intraabdominal abscess formation. Ong and colleagues in their study reported a 6% incidence of abscess formation[20]. Bauer et al. concluded that intra abdominal abscess formation was not influenced by preoperative antibiotic prophylaxis[21].

Although one cannot strictly compare the results from these studies and the present study, we conclude that the present study establishes the value of a preoperative single dose antibiotic against both anaerobic and aerobic organisms in reducing the incidence of wound infection to a minimum after appendicectomy in uncomplicated cases. These results are comparable to other similar studies[22].

CONCLUSION

A single dose of parenteral cefuroxime given before operation seems to be sufficient and not inferior to postoperative antibiotic treatment in preventing wound infection after appendicectomy. Cefuroxime is well-tolerated, and no side effects were seen in our patients. We recommend a dose of 1.5 g cefuroxime before appendicectomy.

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