MJBU, Vol 13, No. 1&2, 1995

A SINGLE DOSE OF CEFOTAXIME IN THE PROPHYLAXIS OF POST-APPENDICECTOMY SEPSIS.

Mohammad H. Al-Jawher, Jawad H. Ahmed, Manal E. Yassen.

Mohammad H. Al-Jawher, MBChB, CAABS, lecturer, Department of Surgery, College of Medicine, University of Basrah.

Jawad H. Ahmed. MBChB, PhD (Pharmacol.). lecturer, Department of Pharmacology, College of Medicine, University of Basrah.

Manal E. Yaseen, MBChB, MSc (microbiology). Department of Microbiology, College of Medicine, University of Basrah.

ABSTRACT

In order to explore the effectiveness of single doses of cefotaxime in the prevention of post appendicectomy wound sepsis, two groups of patients 100 patients each, were given cefotaxime as a single dose one hour before the operation (the first group) and the second group were given the conventional combination of antibiotics (ampicillin, metronidazole and gentamicin) for 3 days after the operation. The rate of wound infections were between 12-15% for the two groups. It was concluded that the use of a single dose of cefotaxime (preoperative) is as effective as the use of long course of antibiotics given after the operation. A single dose of antibiotic could provide the advantages of shorter pressure on patient flora, less drug toxicity, reduction of work load and reduction of cost.

INTRODUCTION

Quite often post operative wound infection annoys surgeons because it is associated with increased morbidity & mortality. The practice to challenge such problem is by preoperative precautions such as meticulous skin preparation, scrubbing, aseptic surgical techniques in addition to subjecting the patient to a heavy post-

operative course of more than one antibiotics. In recent years, there is some experimental and clinical evidence that preoperative administration of antibiotics results in high levels in the tissue during surgery particularly when the wound is contaminated[1,2]. The latter point highlighted the importance of administering antibiotics before starting the operation. The aim of the present study, therefore, was to compare the rate of post-operative wound infection in patients receiving a single dose of cefotaxime given during the operation and the rate of infection after the use of the conventional long course of post-operative antibiotics.

PATIENTS AND METHODS

Two hundred patients that had appendicitis were included in the study. The study was done between April 1990 to December 1991 in the surgical ward 2 at Basrah General Hospital. Cases of perforated appendix were not included in the study.

The study population were randomly allocated into two groups 100 patients each.

Patients in group one received a single dose of cefotaxime (claforan, Roussel, UK.) on the operation table immediately before the operation. One gram of cefotaxime was prepared in 5% glucose water and given as a slow intravenous infusion within 30 to 60 minutes. For children less than 15 years, in order to avoid infusing high dose of cefotaxime, half of the dose was infused before the operation and the rest was continued for eight hours after the operation has finished.

Patients in the second group were assigned to receive the conventional post operative regimen of antibiotics. Ampicillin (0.5 gm six hourly), gentamicin (80 mg three times daily) and metro-

nidazole (500 mg three times daily). For children less than 15 years the dose was given according to body weight (ampicillin, 75 mg/kg/day, gentamicin, 5mg/kg/day, metronidazole, 30mg/kg/day). This combination of antibiotics were continued for 3 consequent post operative days. The characteristics of patients were shown in table 1.

Table 1.: The characteristics of patients included in the study

	Cefotaxime group	controlled group
No. of patients	100	100
Age range	11-30 years	10-30 years
Mean±(SD)	21.9(5.8)	23(6.6)
sex	56M/44F	60M/40F
Time of operation	40±5 min	38±4 min
Use of drain	none	none

Wounds were considered infected when there was fever, pain, induration, swelling or purulent discharge from the site of operation. Inspection for features of wound infection started after the operation and continued for one month

In case wound infection is encountered swabs were taken and sent for culture and sensitivity. Swabs were only sent for aerobic bacteria.

RESULTS

CEFOTAXIME GROUP:

Out of the 100 patients who received cefotax-

ime, 15 patients developed wound infection, 2 patients developed deep intra-peritoneal abscess which required drainage. Swabs were taken for culture and disc sensitivity test from those 15 patients. The result of culture showed Pseudomonas in three patients, Klebsiella in three patients, and nine patients had mixed infection. Patients with wound infection required an additional course of antibiotics of metronidazole and gentamicin.

CONTROLLED GROUP:

Out of the 100 patients who were treated by ampicillin, gentamicin and metronidazole for 3 post operative days, 12 patients developed wound infection. Three of them developed post operative intra peritoneal infection (one treated conservatively and 2 patients required surgical intervention by extra-peritoneal drainage). Swabs from all infected wound were sent for culture and sensitivity test which showed; Pseudomonas in two patients, Klebsiella in three patients and mixed infection in 7 patients. There were no side effects reported to any of the antibiotics used. The results for the two groups were summarised and listed in table 2.

Table 2. The percentage of patients having post appendicectomy wound infection

	Cefotaxime group	Control group
% of wound sepsis	15%	12%
Isolated bacteria: (number of patients)		
Pseudomonas	3	2
Klebsiella	3	3
mixed infection	9	7

DISCUSSION

Appendicectomy continues to be amongst the commonest of emergency abdominal procedures. Though the mortality of acute appendicitis has fallen markedly, mortality, morbidity from residual sepsis remains substantial specially in cases of perforation[3,4]. Clinical studies has reported that wound sepsis may occur in 10-30% of patients[5]. The microorganisms which are responsible for most cases of wound infection were also studied and recognized that anaerobic microorganisms particularly Bacteroides species play an important role and in some studies such microorganisms were isolated from around 90% of infected appendicular wound[6].

Based on the knowledge of the causative microorganisms, the reduction in post operative wound infection achieved by empirical choice of multiple antibiotics could also be achieved by the use of a single dose of an antibiotic which has a spectrum of activity including anaerobic micro-organisms. Among these antibiotics, clindamycin which is known to have activity against anaerobic microorganisms has been used as a single dose and compared with a single dose of cefazoline and a placebo[7]. And also in other studies mezocillin or cefonicid[8], metronidazole or augmentin has been used as a single dose in the prophylaxis agaist post operative sepsis[9]. The information obtained from these studies has shown a reduction in the rate of post operative wound sepsis to provide a good bases to the usefulness of single doses of antibiotics in the prevention of wound sepsis and further confirmed the involvement of anaerobic bacteria.

Cefotaxime which is a third generation cephalosporine has been used in this study because it has activity against various types of bacteria including anaerobes, although the latter effect

is less than that of metronidazole[10]. The drug was given I.V. immediately before starting the operation in order to achieve a peak plasma concentration to coincide with the time contamination is most likely to occur.

In the present study there were no significant differences in the rate of infection between the cefotaxime group (15%) and the group who received the triple course of post operative antibiotics (12%). Cefotaxime has been studied by Lau et al.[11]. In their study single doses of cefotaxime, metronidazole, and a single dose of the combination were given for three separate groups of patients undergoing appendicectomy. The rate of wound sepsis in their study was 12, 30 and 13% for the three drugs respectively. These results are in agreement with the results obtained in the present study.

The interpretation of any change in the rate of wound sepsis could be incomplete and less informative without having information on the rate of wound infection in a control group of patients on no antibiotics, however, such studies could be difficult since ethical approval could not be obtained for potentially contaminated operation such as appendicectomy.

In conclusion, the use of a single dose of cefotaxime is effective in reducing the rate of post appendicectomy wound sepsis and could provide the advantages of being well tolerated by the patients, a shorter pressure on patients flora, less drug toxicity and reduction in the work load of nursing and reduction in cost.

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