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THE ROLE OF PROPHYLACTIC ANTIBIOTIC IN MESH INGUINAL HERNIORRHAPHY

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ABSTRACT

Background: Inguinal hernia is one of most common type of elective case that present in outpatient clinic. Repair of hernia with mesh is the most popular technique for repair of inguinal hernia, there is a controversy in use of prophylactic antibiotics to prevent the infection at surgical site of operation. The aim of this study is to find out the efficacy of antibiotics in prevention of infection at mesh inguinal hernia repair. **Method and material**: it is randomized double- blind trial for patients had inguinal hernia repair with mesh. the study conducted at Baquba teaching hospital from 1st Feb 2012 till 31th Dec. 2016. patients included in this study divided into 2 groups, 1st which given prophylactic antibiotic, 1gm cefotaxime intravenously, before 30 minutes of operation and the other placebo group which given distilled water. **Result:** A 200 patients included in the study divided into 2 equal groups. infection occur in 2 of 100 (2%) in prophylactic group while 5 of 100(5%) in placebo group, most of infection occur between day 5 and 10 postoperatively. Most of them treated with conservative method without need to remove of mesh. Prophylactic antibiotic was not decrease incidence of infection when compared to placebo group**. Conclusion**: the study indicates that there is no big difference between prophylactic group and placebo group. According to our results we recommend not to use the prophylactic antibiotic in elective cases of inguinal hernias mesh repair.

KEYWORDS: Inguinal hernias mesh repair, prophylactic antibiotics, surgical site of infection.

INTRODUCTION

Hernia repair is one of most common clean procedure that performed by surgeons every day. The mesh consider as a foreign body and because of the fear of infection, many surgeons still use of prophylactic antibiotics. Several controlled randomized trials have been published, Some trials excluded cases where a mesh was used,[1] others included different types of hernia in addition to inguinal and/or different methods of repair, with or without a mesh.[2] In some trials local antibiotic injection was used.[3] Even though hernia is classified as a clean surgery, the reported incidence of wound infection varies from 0% to 9%.[2] As more and more surgeries are done as day case procedures. the role of prophylactic antibiotics in mesh repair of inguinal hernia is unclear. The first randomized control trial on the role of antibiotic prophylaxis in mesh repair of inguinal hernia was done in 2001 by Yerdel et al., who advocated the use of prophylactic antibiotics.[4] However, subsequent trials have produced varied results. A Cochrane meta- analysis on this topic in 2004 concluded that antibiotic prophylaxis in mesh repair of inguinal hernias can neither be recommended nor discarded.[5] this study designed to find out the efficacy of prophylactic antibiotics in prevention of wound infection in mesh inguinal hernia repair.

PATIENTS AND METHODS

This prospective randomized controlled study conducted at Baquba teaching hospital from 1st Feb 2012 till 31th Dec. 2016.

Criteria include all patients with uncomplicated unilateral inguinal hernia treated with mesh repair procedure. diabetic patients, recurrent hernias and patients with chronic ill diseases were excluded from this study. 200 Patients divided into antibiotics and placebo groups. The age of patients range from 16 to 85 years old. All patients tested for allergy to cephalosporin before injection of 1 gm of cefotoxime intravenously before 30 minutes of operation. General, Spinal,epidural and local anesthesia were used. The polypropylene (prolene) mesh used for repair. patients discharge 2nd day postoperatively without antibiotics (analgesics and tonics). dressing changed 2nd day and 4th day, follow up of patients after 7 -10 days at time of stitch removal. Next follow up was after 3 months from operation. all patients learned about signs and symptoms of infection. follow up of all of the patients after 3 month performed by attendance of patients or by phone contact.

RESULT

Among the 200 patients with one month follow up, 100 were in the antibiotic group and 100 were in the control group. Median age of the patients was 45, with range from 16 to 85 years and 190 of patients were males and 10 were females. All of the patients had unilateral hernia. Most of the patients did not have any associated co morbid illness. Patients were randomised to have antibiotic prophylaxis (group A, n = 100) or placebo (group B, n = 100). The two groups were comparable regarding demographic data (Table 1).

Overall, 7 (3.5%) patients developed infectious complications, two from the antibiotic prophylaxis group (A) and five from the placebo group (B). As regards the wound infection rate, also 7 patients (3.5%) in total - 2 (2%) group A patients and 5 (5%) from group B patients - had wound infection according to the definitions of the protocol. Infectious complications are mentioned in Table(2). All these patients were treated in conservative method (antibiotic with surgical drainage and recovered comoletely). Mesh removal was not required in any of the cases with deep infection.

Table (1): Demographics of the Two Groups.

	Antibiotic group (n =100)	Placebo group(n=100)
Age	16-85	17-77
Male/Female	94/6	96/4
Anesthesia G/S/L/E	67/24/9/0	44/38/12/6
Direct/indirect	29/71	26/74
Drain use	4	6

Table (2): Infectious Complications Between the Two Groups.

	Antibiotic group(n=100)	Placebo group(n=100)
Wound infection%	2(2)	5(5)
Orchitis	1	1
Pus discharge	0	2
mesh infection	0	1
Cellulitis	1	3

No significant difference was found between the study groups on analyzing the sub types of infection. Follow-up was complete: 155 patients attend to clinic and outpatient clinic for 3 times at least to check for operation state. the other 45 we contact them by telephone and had no indication of an occurring wound problem at their last visit to the outpatient clinic. Other postoperative infectious complications showed no significant differences between groups (Table 2).

3 patients with deep wound infections had a culture with Staphylococcus aureus. One patient was treated with intravenous antibiotics and surgical drainage and recovered completely. Two other patients were treated with repeated courses of oral antibiotics and drainage of the wound. No one of patient need removal of the mesh. Also there were no recurrence in this study. Variable types of anesthesia were used according fitness of patients (table 3).

Table 3: Types of anesthesia.

Type of anesthesia	Group A	Group B
Spinal	24 (24%)	38 (38%)
General	67 (67%)	44 (44%)
Local	9 (9%)	12 (12%)
Epidural	0	6 (6%)

DISCUSSION

Both in the United States and Europe, more than 1 million inguinal hernia repairs are performed annually.[6] The majority of these repairs are nowadays performed using a variety of mesh techniques of which the Lichtenstein open flat mesh repair is the most popular.[1,3,4,6] Inguinal hernia repair is an elective clean operation, and the postoperative wound infection rate should be very low. Prophylaxis in clean operations has been shown of value in other areas of surgery such as trauma[7] and vascular surgery,[8,9] but in inguinal hernia repair its benefit remains uncertain.

In this randomized, placebo-controlled, double-blind trial analyzing wound infections after hernia repair, there was no significant difference in the rate of wound infections between groups of patients receiving antibiotic prophylaxis or placebo. In the Netherlands, there are no specialized hernia centers.

Overall infection rate was low (3.5%) compared with a similar trial of Yerdel et al[10] (4.8%). The relatively low incidence of wound infection (7%) in our placebo group compared with the 9% in the study of Yerdel et al[10] may be explained by patient and operation characteristics. In the Yerdel et al study of 280 patients, a significant (10-fold) reduction of wound infections (from 9% to 0.7%)

was found. The number of deep infections, however, was also low and not significantly different from our study.

A potential drawback of our study is the timing of administration of the antibiotic prophylaxis: 30 minutes before incision is difficult to organize in most hospitals. In theory, the optimal timing of the administration should be so that the bactericidal concentration is maximal in serum and tissues by the time the skin is incised.[11,12] Another drawback is the shortcoming of the follow-up at 3 months, since 22.5% was done by telephone. There might be an observational error, but these patients were told to come back if there was any complaint and they had no sign of infection at previous visits. It is unlikely that patients do not remember an infection and there is evidence that patients are accurate in determining when a wound is not infected.[13,14]

The use of routine antibiotic prophylaxis in primary inguinal hernia repair should be discouraged. However, because of the large number of inguinal hernia repairs performed in low-risk patients discarding the use of antibiotic prophylaxis will save millions of dollars.

In contrast, if a wound infection occurs, it has been postulated that there is an increase in the recurrence rate,[15,16] but this was in particular when non mesh techniques were performed.

A major problem occurs when the mesh is infected. Several studies reported late-onset of mesh infection or chronic groin sepsis[17,18] eventually leading to complete mesh removal. In this study, 3 deep infections are reported. In all, Staphylococcus aureus was cultured, resulting in no mesh removal.

CONCLUSION

The study indicates that there is no big difference between prophylactic group and placebo group. According to our results we recommend not to use the prophylactic antibiotic in elective cases of inguinal hernias mesh repair.

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