

# Comparative study of preoperative and post operative antibiotic in hernioplasty

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## Abstract


**Background:** Antibiotic prophylaxis use in mesh inguinal hernioplasty is uncommon. Because of the low number of clinical trials assessing its effectiveness, it is not conclusive. **Aim:** to compare the preoperative and post operative antibiotic use in hernioplasty. **Methods:** Randomized control trial was done to measure the benefits of antibiotics given pre and postoperatively on surgical site infection rate in 648 patients of mesh inguinal hernioplasty. Study was conducted in NIMS Medical College and Hospital, Jaipur between May 2012 to October 2014. Patients with a primary inguinal hernia scheduled for hernioplasty were randomized to a preoperative single dose of 1g intravenous cephalosporin plus 500mg of amikacin and another group where single dose of cephalosporin plus amikacin are given postoperatively. **Results:** A total of 648 patients were analyzed. Surgical site infection was 1.26% in the antibiotic prophylaxis group versus 2.10% in the post operative antibiotic. **Conclusion:** Preoperative antibiotic use in patients of mesh inguinal hernioplasty decreased the rate of surgical site infection by almost 50%. **Keywords:** Hernioplasty, Antibiotic Prophylaxis, Surgical Site Infection.

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## INTRODUCTION

Wound infection is one of the most commonly occurring surgical complications. Antibiotics are generally used to avoid and control post operative infections. However, indiscriminate use of antibiotics can lead to problems including an increase in treatment costs and the emergence of resistant micro-organisms. The benefits of antibiotic prophylaxis either in clean-contaminated, contaminated and dirty surgery are universally accepted. Antibiotic prophylaxis is generally accepted in clean surgery (i.e. surgery with no inflammation, no contact with septic material, or interruption of aseptic technique where hollow viscera is not opened) when the placement of prosthetic materials is required, or the development of

infection poses a significant risk to the patient. Nonetheless, controversy remains about the use of antibiotics in some types of clean surgery. The current introduction of mesh hernioplasty for the treatment of Inguinal Hernia has made the use of antibiotic prophylaxis more critical because of the increased infection risk when prosthetic materials are used. We conducted this randomized clinical trial to prove the effectiveness of antibiotic prophylaxis in mesh Hernioplasty for Inguinal Hernia.

## MATERIAL AND METHOD

This prospective, randomized control trial study was conducted on 648 patients in Department of Surgery, NIMS Medical College and Hospital, Jaipur, between may 2012 to October 2014. Study was conducted on patients undergoing elective surgery for mesh hernioplasty for uncomplicated Inguinal hernia. Age group between 20 to 70 years and primary inguinal hernia (unilateral or bilateral) patients were eligible.

### Exclusion Criteria

patients sensitive to cephalosporin and amikacin, patients lost in follow up before three months, the need for antibiotics for a different reason, immunosuppressive disease (diabetes mellitus, malignancy, HIV) or medication (glucocorticoid therapy), allergy to the given

antibiotic, recurrent hernia, or the inability to get an informed consent. Ceftriaxone and Amikacin were chosen because of its known activity against the causative pathogens in inguinal wound infection. The half-life time of Ceftriaxone is 1 to 2 hours; therefore, a single dose of each antibiotic supplies therapeutic level until a few (3–7) hours after wound closure. Two Groups were made

**Group A:** Single intravenous dose of 1gm Ceftriaxone and 500mg Amikacin was given preoperatively, 30 minutes before surgery. No antibiotic was given postoperatively.

**Group B:** Single intravenous dose of 1gm Ceftriaxone and 500mg Amikacin was given postoperatively, after 30 minutes. No antibiotic was given preoperatively. A monofilament polypropylene mesh was sutured in place with monofilament polypropylene suture (Prolene). First dressing was done on 3<sup>rd</sup> post operative day. Skin staplers were removed between 7<sup>th</sup> and 10<sup>th</sup> post operative day. Patients presented with fever, tachycardia, pain, redness, collection, and wound dehiscence. Patients with complications, wound infection or poor outcome were managed with Specific Antibiotics, drainage of collection, and secondary suturing where ever required.

## RESULT

Total of 648 patients were included in the study between may 2012 to October 2014. The patients were randomly assigned to the groups. The number of wound infections was 4 (1.28%) in the group A and 7 (2.10%) in group B. There were 4 (0.3%) deep infections: 1 in the group A and 3 in group B. Superficial infection was present in 7 patients. The findings and results are summarised in Table no. 1.

**Table 1:** Comparison of the Findings and Results of two groups

Variable	Group A (N=316)	Group B (N=332)
Age (years) (mean ± SD)	52.80 ± 11.23	51.6 ± 10.62
Sex no.		
Male	298	305
Female	18	27
Characteristics of hernia		
Direct	122	134
Indirect	166	157
Both	28	41
Anesthesia		
Local	15	21
Spinal	288	303
General	13	8
Duration of surgery (minutes)	39 ± 10	41 ± 12
Wound infection	4	7
Superficial	3	4
Deep	1	3
Duration of stay in hospital	7 ± 2	7 ± 3

## DISCUSSION

It is well documented that antibiotic prophylactic coverage of most “clean-contaminated” surgical procedures can significantly prevent infectious complications, including incision infection, thereby affecting the overall rate of morbidity, mortality and complications.<sup>1</sup> The majority of hernia repairs are now performed using a variety of mesh techniques of which open mesh repair is the most popular.<sup>2</sup> 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<sup>3</sup> and vascular surgery,<sup>4</sup> but in inguinal hernia repair its benefit remains uncertain. In our study there was no significant difference in the rate of wound infections between the two groups of patients receiving antibiotic preoperatively (1.28%) and postoperatively (2.10%). Overall infection rate was low (1.69%) compared with other study of Yerdel *et al*<sup>5</sup> (4.8%). Our study was different as compared to other studies regarding the duration of operation (1.5 times longer in the Turkish study), more use of drains,<sup>6</sup> and repeated aspiration of seromas that could cause secondary infections. In a study conducted by Yerdel *et al*<sup>5</sup> of 280 patients, a significant (10-fold) reduction of wound infections (from 9% to 0.7%) was found. But that was compared to patients receiving antibiotic prophylaxis with patients not receiving antibiotics. The number of deep infections, however, was also low and not significantly different from our study. Results from the present study showed a 50% protective effect of antibiotic prophylaxis on decreasing the incision infection rate when compared to postoperative antibiotic used in patients undergoing hernioplasty and favoured the routine use of antibiotic prophylaxis in the patients. No statistical differences were found among both the group, which makes our results stronger and generalizable. However, we found significant differences in the rates of incision hematoma, between the antibiotic prophylaxis and postoperative antibiotic group. The antibiotic was administered 30 minutes before the operation, and the half-life of the antibiotic was short; so other infections which are hospital acquired are not preventable.

## CONCLUSION

Hence we conclude that it is better to give one dose of antibiotic prophylaxis than giving it postoperatively. It will reduce the infection rate to a greater extent.

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