

Outcome Difference of Inguinal Mesh Hernioplasty using Postoperative Antibiotics Versus no use of Antibiotics

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ABSTRACT

Background: General surgeons commonly perform inguinal hernioplasty with possible complications of surgical site infections in hospitals. This infection at surgical site can be prevented by usage of adequate and proper aseptic measures as well as utilizing prophylactic antibiotics.

Aim: To compare outcome difference of inguinal mesh Hernioplasty using postoperative antibiotics vs. no use of antibiotics.

Methodology: This study was done at in North Surgical Ward, Mayo Hospital Lahore in time of six months. A total of 210 patients suffering from inguinal hernia were taken using consecutive non-probability sampling. Randomization of patients was ensured using lottery methods and patients were divided into into antibiotic group called Group A (n=105) and no antibiotic group Group B (n=105) groups. Using the method of pull in envelope randomization was carried out upon arrival of patients in operating ward. After assuring the aseptic procedures, standard procedure of mesh Hernioplasty was carried out and Group A was administered with oral cephradine both postoperatively and preoperatively for 03 days post discharge from hospital while for group B administration of preoperative antibiotic was carried out.

Results: The average age of subjects in group A was reported as 36.69 ± 14.44 years and in control group it was reported as 43.17 ± 17.36 years. The average hospital stay duration was reported to be significantly lower for Group A was 1.89 ± 0.9 and for control group it was 3.62 ± 1.04 , p-value < 0.0001. In group A 10(9.5%) patients were reported to have infection at surgical site and in Group B the infection at surgical site was significantly higher i.e. 24.8%, p-value 0.003.

Conclusion: In conclusion, this study suggests rate for infection at post-operative surgical site was significantly higher statistically in control group when compared to group A. Hence antibiotics usage, post-operatively, is concluded to be more effective for controlling infection at surgical site post-operatively in patients undergoing inguinal mesh hernioplasty.

Keywords: Inguinal hernia, Mesh Hernioplasty, Surgical Site Infection, Antibiotics.

INTRODUCTION

Inguinal Hernia is considered one of most frequent type of anterior abdominal wall hernia consisting approximately 75% of all hernia cases. Among thyroid and breast surgical procedures the surgical procedure for inguinal hernia is most common accounting for 10-15% of total cases^{1,2}. Since the initiation of using polypropylene mesh in inguinal hernia for providing tension free repair, there are reports of occurrence of several complications including, infection at surgical site, edema, foreign body reaction, fistula formation, as well as recurrence². Despite of knowing all these complications the surgeons prefer using prosthetic material in hernia surgery causing increase in rate of infection post operatively¹⁻⁷. This incidence of post operative infection after hernia surgery is reported to be 1.9 to 7.5%^{1,7}. To prevent the occurrence of infection after inguinal mesh Hernioplasty the usage of antibiotics is recommended although this antibiotic therapy is still under debate^{3,4,5}.

It was reported by Perez AR and his colleagues that 1.7% cases in group A and for group B 3.3% cases develop infection at surgical site¹. Mehmet A and colleagues reported the 0.7% cases in group A and 9%

cases in group B have infection at surgical site⁸. This research has been carried out with the purpose of comparing the post operative outcome of antibiotic therapy after inguinal mesh Hernioplasty for prevention of infection at surgery wound utilizing standard antibiotic (cephradine) post-operatively in group A and no antibiotic for group B, so a proper guideline is made for antibiotics usage which can help for reducing financial expenses on already heavy bill.

The objective of this study was to compare outcome difference of inguinal mesh Hernioplasty using postoperative antibiotics vs. no use of antibiotics

PATIENTS AND METHODS

This prospective randomized controlled clinical trial was conducted at the Department of Surgery, North Surgical Ward, Mayo Hospital Lahore after the approval of the synopsis during 6 months. Non-probability consecutive sampling was done.

Sample Size: Sample size of 210 cases was calculated with 80% power of test, 5% level of significance and taking expected percentage of surgical site infection in both groups i.e., 0.7% in antibiotic group and 9% in without antibiotic group in patients undergoing mesh inguinal Hernioplasty. Male patients aged between 13 and 60 years and clinically diagnosed as having unilateral indirect/direct

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reducible inguinal hernia were included in the study. While patients who have Diabetes Mellitus (fasting blood sugar level >126mg/dl), patients who are taking steroids or immunosuppressive drugs (from history) and any other type of inguinal hernia were excluded from the study.

Data collection procedure: Total 210 consecutive cases were taken for inguinal Mesh Hernioplasty from Out Patient Department. Randomization of Patients was done prospectively to antibiotic category (Group A; n=105) and no antibiotic category (Group B; n=105) Randomization of patients was done prospectively categorizing participants into antibiotic group called Group A (n=105) and no antibiotic group Group B (n=105) groups. Using the method of pull in envelope randomization was carried out upon arrival of patients in operating ward. After assuring the aseptic procedures, standard procedure of mesh Hernioplasty was carried out and Group A was administered with oral cephradine both postoperatively and preoperatively for 3 days post discharge from hospital while for group B administration of preoperative antibiotic was carried out.

Mepore dressings was done in both groups at alternate days after discharge and followed up on OPD basis on 7th, 15th & 30th day for infection at surgical site. Infection at surgical site was determined using 2 or more than 2 signs as redness, fever, elevated temperature or pus exudation from wound till 30 days post surgery. The SPSS version 20.0 was used for statistical analysis in our study in terms of means ± SD. Gender was reported as percentage and frequency. The infection at surgical site was presented as percentage and frequency and comparison of both groups was done to find significant differences by using chi square test. A p value ≤0.05 was considered significant statistically.

RESULTS

A total of 210 cases operated by inguinal mesh hernioplasty were included and the mean age was reported as 39.92±16.25 years. The maximum and minimum ages of cases was recorded as 82 & 12 years respectively. Randomization of Patients was done dividing in 2 equal groups (total 105 subjects in each category). The average age of subjects in group 1 was reported to be 36.69±14.44 years (range=14-70 years) while the average age of cases in group 2 was 43.17±17.36 years (range=15-82 years). The average hospital stay duration was lower significantly in group 1 reported as 1.89±0.9 and for group 2 3.62±1.04, p-value<0.0001. In group 1 10(9.5%) cases had infection at surgical site and in group 2 infection at surgical site was higher significantly i.e., 24.8%, p-value 0.003.

Table 1: Comparison of age, hospital stay and surgical site infection in both study groups

	Antibiotic (n=105)	Control (n=105)	P value
Mean Age (yrs)	36.69±14.44	43.17±17.37	39.92
Hospital stay(days)	1.89±0.90	3.62±1.04	<0.001
Surgical site infection	10 (9.5%)	26 (24.8%)	0.003
	95 (90.5%)	79 (75.2%)	

DISCUSSION

In surgical practices the incidence of infection is most frequently reported and the recovery of patient depends upon the procedure carried out⁹. Infection at surgical site is common occurring complication in procedure of inguinal herniorrhaphy. The advent of tension free herniorrhaphy concept and initiation of mesh hernioplasty caused the usage of prophylactic antibiotics to be more frequent due to elevated risk of infection after usage of prosthetic materials^{10,11,12}. R=This utilization of antibiotics routinely after procedure of inguinal hernia repairs is considered controversial¹³. Hence the researchers carried out this study to determine effectiveness of antibiotic usage in postoperative therapies. A total of 210 male subjects suffering from inguinal hernia presented with average age of 39.92±16.25 years. Inguinal mesh hernioplasty was carried out in these cases without or with post operative antibiotics therapy. The average hospital stay of subjects was observed with usage of antibiotics, and it was significantly less (1.89 ±0.90 days) in comparison to group B (i.e. without usage of post-operative antibiotic; (3.62±1.04 days). Another study shows that average hospital stay by using post operative antibiotic was reported to be significantly lesser than in control group¹⁴.

In this research, infection at surgical site was noted in 36(17%) cases, while a few studies suggest that occurrence of post-operative infection at surgical site was noted in 0.4%-4.8% cases who underwent the procedure of inguinal hernioplasty. One study suggests that infection at surgical site was noted in six percent patients that were involved in the surgical procedure of inguinal mesh hernioplasty^{1,8,14-18}.

In this study, researchers observed infection at surgical site in 10(9.5%) patients who utilized antibiotics while subjects who having no antibiotics post operatively, 26(24.8%) subjects showed infection at surgical site being significantly higher compared to group receiving antibiotic. This study did not match with studies from literature showing 5% patients to have prophylaxis & 7% with-out prophylactic antibiotic. Hence for mesh-repair of inguinal hernia, these studies were not able to demonstrate any significant benefit¹⁴.

Yerdel et al. and Celdran et al. reported incidence for infection in group using antibiotic therapy was near zero (0.7 and 0%) but that after placebo was high 9(8.2%). Due to frequent occurrence of infection in group B this study was concluded early in both groups^{8,18}. Although further meta-analysis was carried out including these two trials which did not suggest the usage antibiotic therapy in prevention of wound infection as 4 RCTs had no reporting of any notable benefit of prophylaxis¹⁹.

Another meta-analysis also reports that SSI after usage of prophylactic antibiotic was noted to be 1.38% and 2.89% SSI after using no antibiotic. This meta analysis suggests 50% effectiveness of antibiotic therapy in mesh inguinal hernioplasty for preventing wound infection and provides evidence in favor of routine prophylactic antibiotics usage in these subjects. Also there was no significant statistical difference between two groups suggesting the results to be generalizable and strong.

Further discussion on usage of antibiotics prophylactically must be continued to find out if there are any risk factors to be considered to select best candidates for this therapy in prevention of wound infection²⁰. One other study reports 10.3% patients having SSI after using antibiotics post operatively and 15.3% patients to have SSI without usage of antibiotics⁷.

CONCLUSION

In our study, it was observed that SSI was present in 17% cases out of which SSI were higher significantly in control group in comparison to subjects given antibiotics. In conclusion, this study suggests rate for infection at post-operative surgical site was significantly higher statistically in control group when compared to group A. Hence antibiotics usage, post-operatively, is concluded to be more effective for controlling infection at surgical site post-operatively in patients undergoing inguinal mesh hernioplasty.

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