ORIGINAL ARTICLE

Role of single dose prophylactic antibiotic in prevention of surgical site infection after lichtenstein hernioplasty: A randomized control trial

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Abstract:

Objective: To determine Efficacy of pre-operative single dose antibiotic in preventing surgical site infection in patients undergoing lichtenstein hernioplasty for inguinal hernia.

Introduction: Inguinal hernia is the defect in myofacial plane of internal oblique and transversus abdominis muscle allow herniation of abdominal viscera's or extraperitoneal organs. After inguinal hernia surgery the surgical site infection varies from 1% to 9%. The use of antibiotic prophylaxis is still controversial.

Materials and Methods: This randomized control trial study was carried out in the Department of Surgery, District Headquarter (DHQ), Abbottabad from 1st January 2021 till 31st December 2021. 116 patients with unilateral inguinal hernia were included for study after informed consent. Patients were randomized into two groups. One group was given prophylactic antibiotic others were given placebo.

Results: 116 patients were included in study. 58 patients in each group. Mean age in group-A was 46.72±14.89 years. In group-B it was 42.07±12.5 years. In Group-A out of 58 patients 3(5.17%) developed SSI. While in group-B 10(17.24%) patients developed SSI with a p value 0.039. Difference between two groups was significant.

Conclusion: Use of prophylactic antibiotic in pre-operative phase reduces the risk of infection in inguinal hernia surgery particularly when mesh is used.

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Introduction:

Inguinal hernia is the defect in myofacial plane of internal oblique and transversus abdominis muscle allow herniation of abdominal viscera's or extra-peritoneal organs. Inguinal hernia repair is amongst the most frequently performed surgical procedure. They can be direct, indirect, pantaloon. It usually presents with a swelling or pain in inguinal region. Diagnosis is mostly clinical. Open technique or laparoscopic can be used for surgery. Usually a tension free repair using a mesh is done. In case of contra-indication primary repair by suture is performed.[1] Inspite of the fact that it is a clean surgical procedure, mostly it is considered that use of antibiotic is not required but the use of mesh can predispose to dangerous complications including infection as it is a foreign body. After inguinal hernia surgery the surgical site infection varies from 1% to 9%.[2] The most common organism involved in infection is Staphylococcus aureus. The use of antibiotic prophylaxis is still debatable. The efficacy of various antibiotic groups has been studied, like first generation cephalosporin (cephaloridine, cefazolin), in second generation (cefuroxime) and in third (cefonicid, cefotaxime), beta lactamase inhibitors (amoxicillin-clavulanic acid, ampicillin-sulbactam) and flouroquinolones (levofloxacin, ciprofloxacin). Mostly first generation cephalosporin are used as they are cost effective, safe with good potency but other drugs are also being used in actual clinical practice.[3] The European hernia society (EHS) does not advocate antibiotic use pre-operatively

for elective hernioplasty in patients having low risk while they do consider using antibiotics in patients having risk factor such as decrease immunity, old age, recurrence, long duration of surgery. This is applicable to places where SSI rate after clean surgery is less than 5%.[4] Surveys carried out in London and other region of UK showed that majority of surgeons recommend antibiotic prophylaxis and most hospitals have added antibiotic in their guidelines.[5] SSI can be superficial and deep. Deep one pose problem and increase hospital stay. Usually requiring drainage.[6] Diabetes, BMI more than 35 kg/m^2 and smoking can increase the risk of surgical site infection.[7] The purpose of this study was to evaluate role of preoperative antibiotic prophylaxis in inguinal hernioplasty in a local hospital.

Material and Methods:

This Randomized control trial study was carried out in the Department of Surgery, District Headquarter (DHQ), Abbottabad from 1st January 2021 till 31st December 2021. Ethical committee approval was taken prior to study. It was single blinded study. 116-patients with unilateral inguinal hernia were included for study after informed consent. Patients above 18 years of age admitted for inguinal hernioplasty were chosen for study. Female patients, diabetic patients, immuno-suppressive disease, strangulated or reducible hernia and those with recurrent hernias were excluded from study. Patients fulfilling inclusion criteria were randomly divided into two groups each consisting of 58 patients. Both were prepared for operative procedure in the same way. Group-A were give prophylactic antibiotic (amoxicillin-clavulanic acid) while group-B control group were given placebo just before induction. Surgery was performed under spinal anesthesia in both groups. Post-operative wound infection was assessed by pus like wound discharge or redness at the site of surgical wound. Both groups were assessed for post-operative SSI. Patients were kept for 1 day post-operative. They were discharged next day. Patients were also observed for wound infection and follow up was done on 10th post-operative day for stitches removal and one month later. And patients were informed to seek medical care in case of redness or discharge from wound. They were advised daily dressing. Data was recorded in Microsoft excel SPSS version 20 was used for analysis. Descriptive statistics such as mean and standard deviation was calculated for age. Chi square test used for comparing SSI between two groups. $p \leq 0.05$ considered significant.

Results:

116 patients were included in study. Mean age of all patients was 44±13.9 years. All participants were male. 58 patients were included in each group. Mean age in group-A was 46.72±14.89 years. In group-B it was 42.07±12.5 years. In group-A out of 58 patients 3 (5.17%) developed SSI. While in group-B, 10 (17.24%) patients developed SSI with a p value of 0.039. Difference between two groups was significant. Out of thirteen surgical site infections 12 were superficial.

Only one patient in placebo group had deep SSI and required removal of stitches and evacuation of pus followed by daily dressing and post operative antibiotics.

Discussion:

Inguinal hernia repair is amongst the frequently performed procedures. Many techniques have been described including open and laparoscopic. Both procedures can be carried out with mesh and without mesh. In meshplasty surgical site infection is amongst the commonest complication. Main objective of prophylactic antibiotic is to increase blood level of antibiotic at the site of surgery to prevent colonization by dermal micro-organism and secondary infection.[8] Although the use of prophylactic antibiotic use was controversial in inguinal hernioplasty but nice guidelines suggest that since a foreign body is implanted in a clean surgical procedure than prophylactic antibiotic should be used.[9] Antibiotic prophylaxis guidelines include indication of usage, type of antibiotic, time of antibiotic and route plays vital role. Some advocate single dose antibiotic should be administered exactly before making an incision.[10] In our study only 3-patients in antibiotic group developed surgical site infection while in control group 10 pa-

tients developed surgical site infection. There was a significant difference in both groups with a p-value of 0.036. Many authors have not found this difference. In a study the difference between two groups was found to be 0.426.[11] Another study showed no benefit in using antibiotic prophylaxis.[12] In contrast several studies have shown that antibiotic prophylaxis is beneficial and prevents wound infection in post-operative phase.[13,14] Those in favor of antibiotic use suggest that since hernia surgery is amongst commonest procedure any development in the treatment can have a significant effect on medical and economical aspect, particularly reduction in number of wound infection. Those against the use suggest that avoiding use of prophylactic antibiotic may lessen the risk of toxic and allergic side effects and could avoid development of bacterial resistance.[15] Amongst antibiotic cephalosporin are generally used as prophylactic antibiotic in most of the operative procedures, they can target pathogens that are responsible for infections in post operative phase. Apart from that Amoxicillin-clavulanic acid is also used for prophylaxis in inguinal hernioplasty.[16] In addition to antibiotic prophylaxis many factors play role in development of infection in clean surgery like development of seroma, usage of drain, sterilization of instruments, duration of surgery, duration of stay.[17]

Conclusion:
Single dose prophylactic antibiotic was effective in our study. There was significant difference in surgical site infection rate in both groups. Prophylactic antibiotic have a role in surgeries where foreign materials are used especially inguinal hernioplasty and they can decrease the rate of wound infection.

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Bushra Abdul Waheed, wrote initial manuscript, references, and collected data.

Sameeah Hanif, collected data and helped in introduction writing.

Soweba Hanif, critical review the article and made final changes

Batool Zehra, helped in collected the references

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