ORIGINAL ARTICLE

EFFICACY OF PREOPERATIVE SINGLE DOSE ANTIBIOTIC IN PATIENTS UNDERGOING MESH REPAIR FOR INGUINAL HERNIA

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Background: Inguinal hernia is the commonest type of external hernias. Lichtenstein mesh repair is the most favoured technique of inguinal hernia repair nowadays. It is tension free repair of weakened inguinal wall using polypropylene mesh. The present study was conducted to determine the efficacy of single dose antibiotic with placebo on patients undergoing inguinal hernia mesh repair. **Methods:** This randomised controlled trial was carried out in the Department of General Surgery, Ayub Teaching Hospital, Abbottabad from January to December 2011. The study population included male patients presenting with primary unilateral inguinal hernia, above 18 years of age. Mesh repair was performed in all patients. The patients were randomly divided into two groups. Patients in group A were given a single dose of antibiotic before inguinal hernia mesh repair and patients in group B were given placebo before inguinal hernia mesh repair. Efficacy of antibiotic and placebo was accessed in terms of surgical site infections (SSIs). **Results:** A total of 166 cases of inguinal hernia mesh repair patients were recorded during the study period. A total of 83 patients were recruited in each group. Surgical site infection was found in 6 (7.2%) in Group B it was 15 (18.1%). The difference being statistically significant (p=0.036). **Conclusion:** Antibiotic prophylaxis is a preferred option for mesh plasty.

Keywords: Inguinal hernia, Mesh repair, Antibiotics, Infection

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INTRODUCTION

Surgical site infections (SSIs) are the most common complication following surgery. Amongst all the external hernias, inguinal hernia is the commonest type, i.e., more than 80% and its repair accounts for 10−15% of all the operations in general surgery.[1] Lichtenstein mesh repair is the most favoured technique of inguinal hernia now a days. It is tension free repair of weakened inguinal wall using polypropylene mesh.[2]

Meta-analyses demonstrate that antibiotic prophylaxis is the most effective strategy for preventing SSI following breast[3,4], appendix[5] and colorectal surgery[6], but there is no associated risk reduction for herniorraphy, hernioplasty or laparoscopic cholecystectomy.[7] As many as 1% of patients undergoing clean (e.g., breast, hernia) and 11% of patients undergoing clean-contaminated (e.g., colorectal) surgery experience SSIs.[8] They are problematic for patients owing to pain, delayed wound healing, delay of subsequent treatment, time lost from work and, rarely, death. For the institutions providing care, SSIs contribute to increased costs owing to longer hospital stays, readmissions and additional use of antibiotics that can lead to antibiotic-resistant bacteria. Patients who experience SSIs are up to 60% more likely to spend time in the intensive care unit, 5 times more likely to be readmitted to hospital and twice as likely to die compared with patients without an SSI. Care for patients with SSIs was estimated to cost, on average, US$ 5,155 compared with US$ 1,733 for those with an uncomplicated postoperative course.[9] The main arguments against routine use of antibiotics prophylaxis in Lichtenstein hernia repair are that infection occurs even in the presence of antibiotics, overuse of antibiotics causes development of resistance, since large number of patients undergoes mesh repair so it has a huge cost on health budget, there are unknown chances of allergic reactions which may be fatal sometimes and if infection develops at all it can easily be treated. Conversely if infection occurs after mesh repair it has 4-fold increase in recurrence rate and may need drainage and even mesh removal. The presence of mesh does not increase the chances of infection but when infected then the consequences are severe.[10]

The role of antibiotic prophylaxis in case of inguinal hernia mesh repair is still under debate.[11] Antibiotic prophylaxis for elective inguinal hernia repair cannot be firmly recommended or discarded and further studies are needed particularly on the use of mesh repair.[12] In one study, there was no statistically significant difference was found in the incidence of SSI after hernia repair (2% in antibiotic group while 2.88% in placebo group.[13] In another study, the rate of wound infection in antibiotic group was 10.34% compared to 15.38% in placebo group after hernia repair.[14] Another meta-analysis showed 50% decrease in SSI in antibiotic prophylaxis group compared to placebo group.[15] The infection rate in another study was 4% in antibiotic group while 11% in placebo group after hernia repair surgery.

Existing controversies in literature regarding use or of prophylactic antibiotic before hernia repair surgery, the rationale of this study was to compare the single dose antibiotic prophylaxis with placebo in prevention of SSI after mesh repair for inguinal hernia.

MATERIAL AND METHODS

This randomised controlled trial was conducted in Department of Surgery, Ayub Teaching Hospital, Abbottabad from January to December 2012 after approval of the Hospital Ethical and Research Committee. It was a single blinded trial. One hundred and sixty-six patients with unilateral inguinal hernia were enrolled in the study after taking written informed consent from the patients. All male patients presenting above 18 years of age were included in the study. Patients with Diabetes (Fasting blood glucose >126 mg/dl), history of intake of steroids in last 2 weeks, obstructed/ strangulated or recurrent hernia, chronic liver disease, Body Mass Index ≥29, and impaired renal functions were excluded from the study.

The patients diagnosed as inguinal hernia were taken through OPD, and were randomly placed into 2 groups using block method of randomisation (block size of 4). All patients in both groups were put on OT list for the next OT day after following routine and standard preoperative preparations kept uniform for all participants. Patients in Group-A were given a single dose of 1 gm Co-Amoxiclav, and patients in Group-B were given placebo, one hour before inguinal hernia mesh repair. All surgical procedures were performed by a single general surgeon. Postoperatively all patients were kept in ward under observation for 2 days and discharged on second postoperative day. Follow-up visit was advised to all patients on 14th postoperative day to detect efficacy in both groups in terms of SSI. All patients were advised at the time of discharge to report to OPD in case they feel any problem with the wound.

All data were recorded on a pre-designed proforma and analysed using SPSS-14 considering $p \leq 0.05$ as significant. Efficacy in both groups was stratified among the age to analyse the effect modifiers.

RESULTS

A total of 166 patients were included. Age of the patients ranged from 22 to 74 (Mean 53.45±11.782) years. The mean age of Group-A was 54.33±11.77 years, and in Group-B it was 52.58±11.80 years. In Group-A SSI was observed in 6 (7.2%) while 77 (92.8%) had a healthy scar. In Group-B SSI was seen in 15 (18.1%) cases and 68 (81.9%) had healthy scars. The difference between the two groups was significant (p=0.036) (Table-1).

Table-1: Frequency distribution of surgical site infection in both groups [n (%)]

Group	Surgical Site Infection		Total	*p*-value
	Yes	No		
Group-A	6 (7.2)	77 (92.8)	83 (100)	0.036
Group-B	15 (18.1)	68 (81.9)	83 (100)	
Total	21 (12.7)	145 (87.3)	166 (100)	

DISCUSSION

Antibiotic prophylaxis of wound infection was successful in majority of our patients. In a study conducted by Ijaz A *et al*[15], total of 100 patients were equally divided into two groups of 50 patients each. Out of one hundred patients wound infections was seen in a total of 7 (7%). All the patients were equally divided into two groups of 50 each, out of which 2 (4%) in the antibiotic prophylaxis group and 5 (10%) in the placebo group. Statistical analysis showed no significant difference in the number of wound infections in both groups (p=0.240) which is contrary to the results of the current study.[15] One of the reasons for observed difference in p-value between the two studies may be due to the difference in sample size.

In our study, out of 83 patients antibiotic in single dose group was found effective in 77 (92.8%). In placebo group there was no SSI in 68 (81.9%). There was statistical significant difference between both groups (p=0.036). Study conducted in Ludhiana, India by Thaksur L *et al*[14], showed that out of 55 patients wound infections occurred in 10.34% in the antibiotic group and 15.38% in the placebo group, (p>0.01). Another study conducted in Egypt by Othman I *et al*[13], showed no statistically significant differences in the incidence of SSI after hernia repair (2% in antibiotic group and 2.88% in placebo group, p=0.47). Yin *et al*[11] in their meta-analysis also showed a protective effect in preventing SSI after mesh inguinal hernia repair.[11] Shankar VG *et al*[16], in their randomised double blinded trial accessed 334 patients who were matched for American Society of Anesthesiologists class, type of hernia, type of anaesthesia, grade of surgeon, pre and postoperative hospital stay and duration of operation. The overall infection rate was 8.7% with the incidence of wound infection in antibiotic group was 7% and 10.5% in control group. Though, antibiotic prophylaxis was associated with decreased incidence of wound infection when compared to control group, yet unlike our study the difference was not statistically significant.[16]

The patients in the study group need observation throughout the postoperative two weeks to document which day they developed infection which is a limitation of our study, since we didn't access the patients continuously during the postoperative period. Also we should have been aware of hygienic conditions of patients at their home which may have affected the outcome of the study.

CONCLUSION

Single dose antibiotic among patients undergoing mesh repair for inguinal hernia is preferred option to prevent postoperative infection.

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