

To detect the use of Prophylactic Antibiotics in Inguinal Hernia Repair: A Randomized Study in Tertiary care hospital Karachi

QAZI JALALUDDIN AHMED¹, SUNIL DUTT SUCHDEV², MUHAMMAD ABASR ANWAR³, ALI HASAN⁴, SARFARAZ⁵

ABSTRACT

Aim: To detect the use of prophylactic antibiotics in inguinal hernia repair.

Method and Result: A total of two hundred patients were included that underwent inguinal hernia repair at KVSS Site Hospital from Jan 2012 to Dec 2012; they were randomized in two groups. Group 1 was given prophylactic dose of injamoxi-clav while group 2 was given placebo only. Results were compared and Data analyzed using the Chi-square test. Complications in both the groups were compared. Rate of serous discharge and seroma formation was 1% and 22% respectively in group 1 while 2% and 26% in group 2 also the rate of erythema and stitch abscess were 1% and none in group 1 and 2% and 1% in group 2 respectively. On statistical analysis these differences were not significant.

Conclusion: Prophylactic antibiotics in elective inguinal hernia repair have no substantial advantage over placebo although more studies are essential to prepare some Addition of prophylactic antibiotics in elective open inguinal hernia repair has no significant benefit over placebo although larger studies are required to prepare some uniform guidelines.

Keywords: Antibiotic, hernia, repair.

INTRODUCTION

Prophylactic administration of antibiotics preoperatively has become a very important aspect of care of surgical patients. Recommendations in literature are clear for their use in contaminated and clean—contaminated cases but picture is not so clear in clean surgical cases. Open Inguinal hernia repair using prosthetic mesh is an example of such cases where the preoperative use of antibiotics is debated. Prophylactic antibiotics are those which are given to the patients before the contamination or infection has occurred and in surgical patients these are given just before or during the surgery. The seminal studies of Burke in animals¹ and Palk and Lopez Mayor in patients established that effective prophylaxis require the administration of antimicrobial regimen before the skin is incised. Clinical trials and pharmacokinetic data have shown that prophylactic agents should be given at the time of induction. If duration of operation is prolonged (more than 4 hrs), repeated dose should be administered after 2 half lives of the drug. The goal is to lessen postoperative morbidity, shorten hospitalization, and reduce the overall cost attributable to the infections. Haley et al. have shown that surgical wound infection prolongs hospitalization

for approximately 1 week and adds 20–30% cost to the hospital bill, on the other-hand inappropriate and indiscriminate use of prophylactic antibiotics may increase the cost and unnecessary drug use and growth of resistant organisms². Purpose of this study is to try and find out a clear guideline for use of prophylactic antibiotics in mesh repair of inguinal hernia so that any inadvertent overuse of antibiotics is avoided as well as goal of infection free surgical wound is achieved.

MATERIAL & METHODS

This is a prospective study done on cases of inguinal hernia admitted for mesh repair in a surgical unit of a tertiary care hospital over a period of 1 year. Patients from all age groups and either sex as well as having any type of primary inguinal hernia admitted to our unit over a period of 1 year were included in the study.

Patients with complicated, strangulated hernia, those having local skin infection, systemic infection, diabetes or history of antibiotic use within previous week were excluded from the study. Patients were randomized in two groups by random number table method, Group 1 as cases and Group 2 as controls. After routine investigations and pre-anaesthetic checkup they were subjected to Lichtenstien's method of tension free mesh repair. Informed consent was taken. Skin preparation was same in both the groups using preoperative shaving and 10% povidone iodine

¹Associate Professor Hamdard University Hospital Karachi

²Senior Registrar KVSS Site Hospital Karachi

³Resident Dow University Hospital Karachi

⁴Resident Abbasi Shaheed Hospital Karachi

⁵House Officer Abbasi Shaheed

Correspondence to Dr Ali Hasan; Email:

doctor.karachi@gmail.com; cell: 0333-3069311

as disinfectant. Group 1 was given iv injection of 1.2 gm amoxicillin-clavulanate in 20 ml saline at the time of induction while other group was given 20 ml of sterile saline as placebo. Postoperatively patients were discharged on day one with advise to take analgesic sos, they were contacted telephonically on POD 2 regarding any complains and were asked to come to the ward if there is any, they were then called on day 8 for examination and suture removal.

OBSERVATIONS & RESULTS

Table 1 shows the number of patients in each age group. There were 70.5% of patients in age group of 31–70 years. So both the groups were comparable demographically. Complications in both the groups were compared and tabulated (Table 2). Rate of serous discharge and seroma formation was 1% and 22% respectively in group 1 while 2% and 26% in group 2, p value .33 and .43 respectively. The rate of erythema and stitch abscess were 1% and none in group 1 and 2% and 1% in group 2, p value .33 and 1.00 respectively. Data was analysed using Chi square test.

Table 1 Age distribution

Age range	n	%age
11–20	18	9
21–30	22	11
31–40	32	16
41–50	38	19
51–60	43	22.5
61–70	26	13
71–80	17	8.5
81–90	4	2

Table 2 Complications in both groups

Group 1 n=100 Group 2 n=100 P value
Serous discharge 1 2 .33
Seroma 22 26 .43
Erythema 1 2 .33
Stitch abscess 0 1 1.00

DISCUSSION

Wound infection is one of the most commonly occurring surgical complications. Infection of a wound may result from a number of factors both intrinsic and extrinsic to patient. Although many of intrinsic factors can not be modified, the external ones can certainly be influenced. In particular these are related to aseptic conditions, surgical technique and peri-operative care. However even under the most scrupulous aseptic conditions and with a careful technique, post operative wound infection still present a very serious problem. The use of antibiotic prophylaxis to avoid infectious complications of

surgery is very common in surgical practice. However, indiscriminate use of antibiotics can lead to problem including an increase in cost 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 when placement of prosthetic materials or the presence of infection poses a significant risk to patient. Nonetheless, controversy remains about the use of antibiotics in some types of clean surgery. Surgery for inguinal hernia is one of the most common techniques performed in general surgery making up approximately a third of total interventions³. This type of surgery is considered clean and it has been estimated that rate of post operative infection should not be greater than 2%^{4,5}. Currently, the use of antibiotics prophylaxis is recommended for elective open mesh inguinal herniarepair^{4,5}. However this treatment is not universally accepted. For hernia repair not involving prosthetic material, the antibiotics prophylaxis is not recommended in absence of risk factors but controversy arises when wound infection rates exceed the expected figures^{6,7}. Contradictory results from clinical trials and the investigating effectiveness of antibiotics prophylaxis have complicated this situation⁸. We conducted a single centre prospective randomized study with view to clarify this issue on scientific basis. Total 200 patients were evaluated and they were randomized to have antibiotic prophylaxis (group 1, n=100) and no antibiotic prophylaxis (group 2, n=100). In total 4 cases with infections were detected. 1(1%) of these was in group A and 3 (2 erythema and 1 stitch abscess) in group B. All wound infection were treated with antibiotics, mesh removal was not required in any of the cases. In our study antibiotics do not seem to prevent wound infection in any case, as these differences were not statistically significant but Turkish trial reported significantly different infection rates between group receiving a single dose of ampicillin plus sulbactam and placebo group⁹. Yerdel et al. documented a significant decrease in overall wound infection rate 9% to 0.7% when single dose, intravenous ampicillin sulbactam was used during Lichtenstein hernia repair⁹. Platt 1990 et al. reported a randomized, double blind, placebo, controlled trial of 1218 patients undergoing hernia repair. Of the patients undergoing hernia repair infection occurred in 2.3% of those given Prophylactic antibiotics. The risk ratio was 0.55 with a 95% confidence interval 0.2–1.38. Though the wound infection rate was twice as high in the placebo group yet it was not statistically significant [10]. Taylor et al. conducted a prospective randomized double blind, multicentre

study of 619 patients in six hospitals in England and Scotland. They show there was no statistically significant difference between antibiotics and placebo group in each centre¹¹. Gervino et al. reported a study of 1254 patients undergoing hernia repair. No wound infections were noted. Although there were no control group. They used single dose 1 gm ceftriaxone¹². Celdran et al. in a prospective; double blind randomized controlled trial of intravenous antibiotics prophylaxis in inguinal hernia repair. Statistical analysis with student t-test and fisher's exact test showed the difference between two groups to be highly significant ($p=0.059$) and trial was stopped early for ethical reasons. The author concluded that their results warranted the routine use of antibiotic prophylaxis¹³. This has been criticism for most of trials as their data might have shown the inefficacy of particular antibiotic rather than antibiotic prophylaxis in general given the high rate of wound infection in both groups. However, staphylococcus aureus was isolated in most of the cases with infected wounds in all mentioned trials followed occasionally by other species of staphylococci and streptococci. So this can be assumed that the type of antibiotics used is probably not responsible for the difference in the main outcome between trials. In our study in total 48(24%) patient developed seroma (localized fluid collection). Out of which 22(22%) belongs to group I and 26 belongs to group II. Incidence of seroma of formation is higher in Lichenstein repair as compared to other type of repair. In literature shows similar results (up to 30%) as in our study.

CONCLUSION

In conclusion, we were not able to demonstrate any significant benefit from addition of antibiotic prophylaxis. Consisting a single dose of amoxicillin and clavulanic acid in elective inguinal hernia tension free repair using polypropylene mesh in patients who were not at high risk of developing septic condition.

REFERENCES

1. Burke JF (1961) the effective period of preventive antibiotic action in experimental incision and dermal lesions. *Surgery*50:161–168
2. Haley RW, Culver DH, Morgan WM et al (1985) Identifying Patients at high risk of surgical wound infections. A simple multivariate index of patient susceptibility and wound contamination. *Am J of Epidemiology* 121:206–215
3. Cainzos MA (1998) Antibiotic prophylaxis. *New Horiz* 6(2):S11–S17
4. Condon RE, Wittmann DH (1991) The use of antibiotics in general surgery. *Curr Probl Surg* 28:803–907
5. Woods RK, Dellinger EP (1998) Current guidelines for antibiotic prophylaxis of surgical wounds. *Am Family Physician* 57:2731–2734
6. Balley SI, Karran SE, Toyn K (1992) Community surveillance of complications after hernia surgery. *BMJ* 304:469–471
7. Holmes J, Readman R (1994) A study of wound infections following inguinal hernia repair. *J Hosp Infect* 28:153–156
8. Leaper DJ, Melling AG (2001) Antibiotic prophylaxis in clean surgery: clean non implant wound. *J Chemother* 13:96–101
9. Yerdel MA, Akin EB, Dofalan S et al (2001) Effect of single dose prophylactic ampicillin and sulbactam on wound infection after tension free inguinal hernia repair with polypropylene mesh. *Ann Surg* 233(1):26–33
10. Platt R, Zaleznik DF, Hopkins CC et al (1990) Perioperative antibiotic prophylaxis for herniorrhaphy and breast surgery. *N Engl J Med* 3:153–160
11. Taylor EW, Byrne DJ, Leaper DJ (1997) Antibiotic prophylaxis and open groin hernia repair. *World J Surg* 21:811–815
12. Gervino L, Cangioni G, Renzi F (2000) A retrospective study on the efficacy of short term perioperative prophylaxis in abdominal surgery for hernia repair in 1254 patients. *J Chemother* 12(suppl 3):34–37
13. Celdran A, Frieyro O, De La Pinta JC et al (2004) The role of antibiotic prophylaxis on wound infection after mesh hernia repair under local anesthesia on an ambulatory basis. *Hernia*8:20–22.