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

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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 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 adds20–30% 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 inadvertant 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 Lichenstien’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

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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. For 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>
<thead>
<tr>
<th>Age range</th>
<th>n</th>
<th>% age</th>
</tr>
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<tbody>
<tr>
<td>11–20</td>
<td>18</td>
<td>9</td>
</tr>
<tr>
<td>21–30</td>
<td>22</td>
<td>11</td>
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<tr>
<td>31–40</td>
<td>32</td>
<td>16</td>
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<td>41–50</td>
<td>38</td>
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<td>51–60</td>
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<td>61–70</td>
<td>26</td>
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<tr>
<td>71–80</td>
<td>17</td>
<td>8.5</td>
</tr>
<tr>
<td>81–90</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2 Complications in both groups

<table>
<thead>
<tr>
<th>Group 1 n=100 Group 2 n=100 P value</th>
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<tbody>
<tr>
<td>Serous discharge 1 2 .33</td>
</tr>
<tr>
<td>Seroma 22 26 .43</td>
</tr>
<tr>
<td>Erythema 1 2 .33</td>
</tr>
<tr>
<td>Stitch abscess  0 1 1.00</td>
</tr>
</tbody>
</table>

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 interventions. 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 hernia repair4,5. 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 figures6,7. Contradictory
results from clinical trials and the investigating
effectiveness of antibiotics prophylaxis have
complicated this situation. 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 I, 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 group8. 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 repair8. 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. 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 centre\textsuperscript{11}. 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 ceftrixone\textsuperscript{12}. 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 prophylaxis\textsuperscript{13}. 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**