Pre-Operative Single Dose of Antibiotic Cefatriaxon in Preventing Wound Infection in the Laparoscopic Cholecystectomy

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ABSTRACT

Objectives: This clinical study to evaluate the role of antibiotic prophylaxis in prevention of wound infection in laparoscopic cholecystectomy. And to identify the risk factors for infection.

Methods: Prospective study was done from 1st June to 31st December 2017 in Al-Rabee private hospital for 110 patients under went laparoscopic cholecystectomy (LC).

Group A: the received cefatriaxon 1gm at the time of anesthesia.

Group B: not receive the cefatriaxon.

Results: Wound infections were discovered in 3 (2.72%) patients of all cases, 1 (1.66%) from group A and (4%) from group B 30-50 year most common age incidence, gallstone more common in the females.

Conclusion: Prophylactic antibiotic are not so necessary to prevent wound infection in patients undergoing laparoscopic cholecystectomy.

INTRODUCTION

The laparoscopic cholecystectomy has been the standard procedure for the management of gallstone disease since 1990s.1,2,3,4,5 because it can cure the disease and has low morbidity and mortality.6,7. The study is shorter and the cost is in LC compared with the open cholecystectomy.8 The Antimicrobial prophylaxis for various clean or contaminated surgical procedures has become the standard of practice to reduce the risk of post operative infection. However, studies have shown that prophylactic antibiotic are not generally indicated for clean operation.9,10

In spite of laparoscopic surgery appear to be associated with similar metabolic responses compared with open surgery11 and has low risk for infective complication, Many surgeons still use prophylactic antibiotic, and the use of prophylactic antibiotics for LC is inconsistent and widely among surgeons.9

If antibiotic are given empirically they must exert their action when local wound defenses are at their least. Ideally, maximal blood and tissue levels should be achieved at incision before contamination occur. Intravenous administration at induction of anesthesia is optimal.12

The development of wound infection related to three factors: 1) The degree of microbial contamination of wound during surgery. 2) the duration of procedure. 3) host factors such as diabetes, malnutrition, obesity, immune suppression.13 A single preoperative dose of
antibiotic is effective as a 5 days course of postoperative therapy assuming an uncomplicated procedure. The use of antibiotics preoperatively can reduce the rate of infections, particularly wound infection, after certain operations.

MATERIALS AND METHODS
A prospective study was done during a period from 1st of June to 31st of December 2017 for 110 patients in Al-rabee private hospital undergone the laparoscopic cholecystectomy. The two groups were recorded for risk factors of infection, diabetes mellitus, steroid, obesity, smoking, anemia, spillage of bile, age, and duration of operation.

RESULTS
Table 1 shows the results of age distribution in this study as the following:

<table>
<thead>
<tr>
<th>Age</th>
<th>Prophylactic antibiotic</th>
<th>No prophylactic antibiotic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>10-19</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>20-29</td>
<td>5</td>
<td>8.33</td>
<td>4</td>
</tr>
<tr>
<td>30-39</td>
<td>25</td>
<td>41.66</td>
<td>20</td>
</tr>
<tr>
<td>40-49</td>
<td>20</td>
<td>33.33</td>
<td>18</td>
</tr>
<tr>
<td>50-59</td>
<td>6</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>60-70</td>
<td>4</td>
<td>6.66</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>100</td>
<td>50</td>
</tr>
</tbody>
</table>

Gender: Gallstone more common in female so laparoscopic cholecystectomy done in the females more than men that show in the Table 2.

Table 2: gender distribution.

<table>
<thead>
<tr>
<th>Gender of patient</th>
<th>group A</th>
<th>group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5 (8.33%)</td>
<td>4 (8.18%)</td>
<td>9 (8.18%)</td>
</tr>
<tr>
<td>Female</td>
<td>55 (91.66%)</td>
<td>46 (92 %)</td>
<td>101 (91.81%)</td>
</tr>
<tr>
<td>Total</td>
<td>60 (100 %)</td>
<td>50 (100 %)</td>
<td>110 (100 %)</td>
</tr>
</tbody>
</table>

Risk factors: Table 3 show the risk factors in the patients of this study.

Table 3: The distribution of risk factors.

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>group A</th>
<th>group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes mellitus</td>
<td>2 (3.33%)</td>
<td>3 (6%)</td>
<td>5(5.45%)</td>
</tr>
<tr>
<td>Obesity</td>
<td>8 (13.33%)</td>
<td>5 (10%)</td>
<td>13 (11.81%)</td>
</tr>
<tr>
<td>Anemia</td>
<td>2 (3.33%)</td>
<td>1 (2%)</td>
<td>2.72 (4.54 %)</td>
</tr>
<tr>
<td>Smoking</td>
<td>1 (1.66%)</td>
<td>2 (4%)</td>
<td>2.72 (4.54%)</td>
</tr>
<tr>
<td>Steroid</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>More than 60 min</td>
<td>2 (3.33%)</td>
<td>3 (6%)</td>
<td>5 (4.54%)</td>
</tr>
<tr>
<td>Bile spillage</td>
<td>6 (10%)</td>
<td>5 (10%)</td>
<td>11 (10%)</td>
</tr>
<tr>
<td>No risk factor</td>
<td>22 (36.66%)</td>
<td>19 (38%)</td>
<td>41 (37.27%)</td>
</tr>
</tbody>
</table>

Discussion
Despite the controversy surrounding the use of prophylactic antibiotics in laparoscopic cholecystectomy, in western countries 79% of patients undergoing LC have received prophylactic antibiotics pre operatively 63% have received antibiotics postoperatively. The use of prophylactic antibiotics for LC is inconsistent and varies widely among surgeons. Postoperative wound infection were in both groups, overall, 110 patients, (2.72%), wound infection were reported during the study. Only one patient from group A (1.72%) and tow patients from group B (4%) developed wound infection. The results matched with many reports (4.41% in group A and 2.63% in group B), (2% in group A and 4% in the group B), (2.7% in group A and 3.3% in group B), and lower than others (6.9 in group A and 8.6% in group B).

The most important result is that prophylactic antibiotic is of no benefit in preventing wound infection, this result is the same of many other studies including: evidence-based, clinical practice guidelines, double-blind clinical trial study done by Hamid Reza et al. In meta-analysis of Abhishek Choudhary et al who studied 9 randomized and conclude that prophylactic antibiotics prior to LC resulted in no statistically significant benefit for total infection, superficial infection, major infection, distant infection, and reduction in hospital stay. The strengths of this meta-analysis include use of only randomized and controlled trials, varying populations (Europe, USA, Asia), and similar outcome in all studies even though various antibiotics were utilized. Also, no heterogeneity was noted and no bias was noted. The limitations of this meta-analysis include uncertainty about the use of prophylactic antibiotics in high-risk patients undergoing LC which is controversial at this time. A Swedish study of 10927 patients who had an elective cholecystectomy performed in 54 swedish hospitals during 2006 and 2007. Result: The of 54 hospital used prophylactic antibiotics at very different rates, from 0% to 98% of operations, which by far exceeds any random variation. A postoperative abscess was found in 93 (0.9%) and in 377 patients (3.5%) some kind of septic complication occurred requiring antibiotic treatment. In multiple logistic regression analysis, they include that there is huge variation in the use of prophylactic antibiotic in elective cholecystectomy between different hospitals in Swedish reflecting the lack of uniform guidelines. The rate of septic complications from this operation is low and is furthermore unaffected by prophylactic antibiotics.

Iatrogenic gall bladder perforation and spillage of bile and stones is not a come during LC, it occur in of 11 patients (10%) of all cases which nearly similar to other studies where it range from 10.9% to 14%. Incidence of gall bladder perforation tended to be diminished as the surgeons gain experience 39. Also, there was no relation between gall bladder and wound
infection the same result of most studies\(^2\), in contrast with Sabry et al where found that postoperative infection was significantly related to gall bladder perforation, although, organisms isolated from infected wounds were not the same as bile culture.\(^3\)

The low rate of wound infection in LC, which seem to be unrelated to the use of prophylactic antibiotics, may be attributed to many factors including smaller incisions, the tissue handling, less impact on the immune system, minimal exposure to the external environment, CO\(_2\), pneumoperitoneum, better visibility of tissues for dissection and hemostasis, have been advocated.

Conclusions

Although the number of patients is not very large, this study found no difference in the postoperative wound infection rate between patients who received prophylactic antibiotics and not received prophylactic antibiotics in elective LC. So we are suggesting that there is no role of antibiotic prophylaxis in prevention of wound infection in elective LC.

REFERENCES


laparoscopic cholecystectomy. Koomesh Journal of Semnan University of Medical Sciences. 2008; 10(1); 37-42. DOI: 10.19082/2308.