ROLE OF PERIOPERATIVE ANTIBIOTICS IN ELECTIVE LOW RISK CHOLECYSTECTOMIES IN PREVENTION OF SURGICAL SITE INFECTIONS

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ABSTRACT

BACKGROUND

Cholecystectomy is the universally accepted method to manage symptomatic uncomplicated cholelithiasis and other benign gallbladder diseases, because it can cure the disease and has low morbidity and mortality. The most frequent complication in patients undergoing cholecystectomy is surgical site infection. Cholecystectomy is considered clean-contaminated if the biliary tract is entered without significant spillage during the procedure. Some randomised clinical trials have confirmed that antibiotic prophylaxis in open cholecystectomy is decreasing the risk of surgical site infection.

MATERIALS AND METHODS

Randomised studies have failed to demonstrate the effectiveness of routinely administered perioperative antibiotics on SSI in these low and moderate risk groups and there is growing consensus against it. Many authors believe that antibiotic prophylaxis may not be necessary for low-risk patients undergoing elective cholecystectomies.

RESULTS

The present study was aimed to observe if antibiotic prophylaxis is necessary to prevent SSIs in the patients undergoing elective below-risk cholecystectomies.

CONCLUSION

Our study found no significant difference in the rates of SSI in low-risk laparoscopic cholecystectomies with or without the use of perioperative antibiotics.

KEY WORDS

Laparoscopic Cholecystectomy, Surgical Site Infection, Methicillin-Resistant Staphylococcus aureus.


Background

Surgical site infection significantly contributes to surgical morbidity and mortality every year. It denotes infection at or near surgical incision within 30 days of surgery. It accounts for almost 15% of all nosocomial infections and represents the most common nosocomial infection.1 Post-operative infections lead to increased hospital stay, incurring escalated expenses, increased number of hospital readmissions and jeopardised health outcomes.

Most common source of pathogen is the native flora of patient’s skin, mucosal surfaces or hollow viscus. On breach of skin, underlying tissue is exposed to overlying endogenous flora. Most commonly aerobic gram positive cocci such as Staphylococcus sp serve as the main contaminant with resistant pathogens such as methicillin resistant S. aureus (MRSA) denoting increased number of such infection in recent times.2,3 Breach of hollow viscus exposes surrounding tissues to gram negative bacilli such as E. coli, gram positive organisms such as Enterococci and occasionally anaerobes such as Bacillus fragilis.

Cholecystectomy is a globally accepted standard method to manage cholelithiasis and other benign gall bladder diseases, since it is curative and carries low morbidity and mortality. Common complication undergoing cholecystectomy is surgical site infections. SSIs were reported in 10% to 23% of the patients who had been operated on before the routine use of antibiotic prophylaxis was introduced in 1960.4

Since 1960, antibiotic prophylaxis has been considered as the best intervention to prevent surgical site infection in elective surgery. Antibiotic prophylaxis includes preoperative administration of wide-spectrum antibiotics against the most frequent bacteria involved in surgical site infection, trying to get high tissue levels of the antibiotic at the surgical wound in order to avoid colonisation and growth of microorganisms. It is accepted that antibiotic prophylaxis must be administered in all surgical procedures classified as clean-contaminated or in selected patients undergoing clean procedures.

Cholecystectomy is considered clean-contaminated on the
basis that the biliary tract is entered without significant spillage during the procedure. Some randomised clinical trials have confirmed that antibiotic prophylaxis in open cholecystectomy is decreasing the risk of surgical site infection. Randomised studies have failed to demonstrate the effectiveness of routinely administered perioperative antibiotics on SSI in these low and moderate risk groups and there is growing consensus against it. Many authors believe that antibiotic prophylaxis may not be necessary for low-risk patients undergoing elective cholecystectomies. The present study was aimed to observe if antibiotic prophylaxis is necessary to prevent SSIs in the patients undergoing elective low-risk cholecystectomies.

MATERIALS AND METHODS
This non-randomised controlled trial was conducted in the Department of Surgery, Dr. Rajendra Prasad Government Medical College, Kangra at Tanda, during one year period after approval from institutional protocol review and ethics committee. All patients hospitalised for elective cholecystectomy after fulfilling the exclusion and inclusion criteria during the period of one year were enrolled for the study after informed written consent. Sample size was decided on the basis of all patients hospitalised for elective cholecystectomy after fulfilling the exclusion and inclusion criteria. A detailed history, clinical examination and routine investigations were done in all patients and recorded.

All the patients of both genders between 12 and 60 years of age undergoing laparoscopic cholecystectomy during the period of one year were included in the study. Patients were divided into 2 groups by alternate method, so the study is non-randomised controlled trial. Group A patients did not receive any perioperative antibiotics, while patients in Group B received perioperative antibiotics (cefuroxime + clavulanic acid). The first dose of antibiotic was given half an hour before skin incision. The second dose of antibiotic was not required in any of the patients. Exclusion criteria were patients who had undergone intervention (ERCP) previously, breach of sterilisation, bile spillage, accidental entry into biliary tract, GIT, urogenital system during surgery, patients with diabetes mellitus, tuberculosis, on corticosteroid therapy, HIV+, hepatitis B+ and malignancy etc.

In any of the patients. Exclusion criteria were patients with pregnancy or lactation and refusal to provide consent. (renal function tests), patients in whom drain was kept (liver function tests) and RFT were deranged in the study. Investigations were done in all patients and recorded.

RESULTS
The present study observed that patient’s age was comparable in Group A when compared with Group B (40.21 ± 10.63 vs. 40.71 ± 11.18; p= 0.825). Females outnumbered males with a ratio of 7.64:1. The present study also observed that there was no significant difference in sex between Group A and Group B (p= 0.216) (Table 1).

Duration of preoperative pain (Days) was non-significantly higher in Group A when compared with Group B (p= 0.373) (Table 2).

Our study observed that SSIs were present in 7 patients on post-operative Day 2, out of which 4 were present in Group A and 3 in Group B. Our study also observed that incidence of SSIs was non-significantly higher in Group A when compared with Group B (p= 0.977) (Fig. 1). SSIs were not present in both groups on post-operative Day 7.

Our study also observed that in Group A there were 3 patients with SSI grade III and 1 patient with SSI grade II, while in Group B there were 2 patients with SSI grade II and 1 patient with SSI grade III.

Duration of hospital stay was non-significantly higher in Group A (median/ IQR: 2.0/ 0.00) when compared with Group B (median/ IQR: 2.0/ 0.00) (p= 0.190).

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Mean ± SD</th>
<th>Group A (n=47)</th>
<th>Group B (n=48)</th>
<th>Total (n=95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤20</td>
<td>4.25%</td>
<td>2 (2.08%)</td>
<td>1 (2.08%)</td>
<td>3 (3.16%)</td>
</tr>
<tr>
<td>21-30</td>
<td>14.9%</td>
<td>7 (16.67%)</td>
<td>16 (21.05%)</td>
<td>23 (24.47%)</td>
</tr>
<tr>
<td>31-40</td>
<td>27.6%</td>
<td>13 (27.08%)</td>
<td>29 (30.53%)</td>
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</tr>
<tr>
<td>41-50</td>
<td>36.1%</td>
<td>17 (35.36%)</td>
<td>30 (31.58%)</td>
<td>47 (50.31%)</td>
</tr>
<tr>
<td>51-60</td>
<td>17.02%</td>
<td>8 (20.83%)</td>
<td>18 (18.95%)</td>
<td>26 (27.76%)</td>
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</table>

<table>
<thead>
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<th>Sex</th>
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<th>Group B (n=48)</th>
<th>Total (n=95)</th>
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<tr>
<td>Male</td>
<td>3.68%</td>
<td>44 (93.32%)</td>
<td>43 (88.42%)</td>
<td>87 (91.88%)</td>
</tr>
<tr>
<td>Female</td>
<td>9.18%</td>
<td>4 (8.68%)</td>
<td>11 (11.58%)</td>
<td>15 (16.15%)</td>
</tr>
</tbody>
</table>

Table 1. Age and Sex (n= 95)

Group A (Patients who did not receive any perioperative antibiotics); Group B (Patients who received perioperative antibiotics).
Patients ab was sent for - in the aived antibiotics and did not receive - 5 but only 33% of these received the agent within 1 hour or less 2.3% and a surgical cholecystectomy (LC). They found an overall infection rate of the records of 1,702 patients undergoing laparoscopic observed the similar findings with a single dose of clavulanic acid was not able to lower the rate of SSI. The high rate of SSI in our study could be attributable to our liberal definition of such infections.

The high rate of SSI in our study could be attributable to our liberal definition of such infections.

Our study found no significant difference in the rates of SSI in low-risk laparoscopic cholecystectomies with or without the use of perioperative antibiotics. So, it can be concluded that the use of perioperative antibiotics can be avoided in low-risk cholecystectomies, so as to prevent the misuse of antibiotics.

**REFERENCES**

