

THE ROLE OF ANTIBIOTIC PROPHYLAXIS IN BILIARY TRACT OPERATIONS

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SUMMARY

In this study, the effect of the utilization of prophylactic antibiotic on wound infections has been analysed on 180 low-risk cases that were subjected to elective cholecystectomy. The occurrence of wound infections in 90 patients of prophylactic group (subject to antibiotic prophylaxis) was found to be %6,6 whereas in the control group patients, the occurrence rate was as high as %23,3 and hence, the ratio between the two groups leads to a meaningful result.

Prophylactic antibiotic applications have significant effect on wound infections in low-risk cases.

Key Words: Antibiotic prophylaxis, Cholecystectomy.

INTRODUCTION

The infection in the biliary tract plays the most important role in wound infections after biliary tract operations (1-3). In fact, the application of prophylactic antibiotics for high-risk cases who commonly develop biliary tract infections is highly experienced and agreed within the medical communities (1, 2, 4-6). Yet, the application of prophylactic antibiotics to low-risk cases is still controversial and no full agreement exists (1,5,7).

In this regard, 180 patients subjected to elective cholecystectomy were prospectively analysed and the application of prophylactic antibiotics on low-risk cases was discussed with the aim of developing an approach to this subject.

MATERIALS AND METHODS

180 low-risk patients subjected to elective cholecystectomy between January 1987 - March 1990 were randomly selected and analysed. Prophylactic antibiotic (third generation cephalosporin as ceftriaxone, 2x1 gm. i.v.) was applied to 90 patients (prophylaxis group) during premedication and 12 hours after operation as single doses. Prophylactic antibiotic was not applied to the other 90 patients (the control group).

Sixty-nine of the patients in the prophylactic group were female (%76,6) and the average age was 52. Sixty-three of the patients in the control group were female (%70) and the average age was 54. In all patients Penrose drain was placed on Winslow's cavity and the drain was removed on the third day following the operation where no discharge was observed.

The patients who developed edema, reddening, fever, pain and suppuration in the operation area were decided to have wound infection and this observation was supported by culture findings, also.

RESULTS

Wound infection occurred in twenty-one patients (%23,3) in the control group and in six patients (%6,6) in the prophylactic group. Wound infection ratio in prophylactic and control groups was observed to be of statistical (test) importance (Table I).

Table I: The wound infection in control and prophylactic groups.

	Wound infection	%	No wound infection	%	Total	%
Control group	21	23,3	69	76,7	90	100
Prophylactic group	6	6,6	84	93,4	90	100

P < 0,01

DISCUSSION

Operation wounds get infected in two ways:

- 1- Exogenous (operation devices and materials, operation room atmosphere, operating team).
- 2- Endogenous (skin or organs of the patient).

The source of infection in the clean cases whom gastrointestinal or urinary system organs are not opened is exogenous. Four factors effect development of wound infection:

- 1- The immune status of the patient
- 2- Asepsis and antisepsis
- 3- A good operation technique
- 4- Antibiotic prophylaxis

The last three factors may easily be provided and particularly antibiotic prophylaxis is the most effective and practical method (5, 8, 9,10-14).

As Burke's (8) experimental researches and clinical application it is necessary to apply antibiotics within maximum four hours prior to the operation.

Basic features of antibiotic prophylaxis, according to the experimental and clinical studies are as follows:

- 1- Antibiotics should be applied before contamination and the time should not be more than four hours in advance (11,14).
- 2- Medicine density should be sufficient in the tissues.
- 3- Preoperative prophylaxis should be continued postoperatively.

Studies in this field indicate that starting the application of medicine after the operation has no effect (14, 15). Single dose in prophylaxis is generally accepted to be sufficient, however, if the decision is for the continuation of the medicine during the postoperative period (multi-dose), the application should not exceed two days (14,15).

Biliary tract infection develops either exogenous or endogenous (1-3, 6, 7). Although most biliary tract infections are minor wound infections, sometimes sepsis, liver abscess or insufficiency, disseminated intravascular coagulation, renal insufficiency endotoxemia may develop and result in death.

Agreement exists in prophylactic antibiotic application to high-risk patients. Some suggest that infection possibility in low-risk cases is less than %5, since these patients have clean wounds and therefore antibiotics are unnecessary (1,5). However, the majority suggest the contrary. Keighley (16) analyzed 181 patients to whom prophylactic antibiotics were not applied and found that wound infections in emergency operations were %41, in elective operations %18 and

in low-risk group %19. Stubbs (17) found wound infections to be %15 in simple cholecystectomies. McLeish (18), in his controlled study, found the wound infection ratio to be %7 when antibiotics were used and %22 when antibiotics were not used. Morran (7) observed that in simple cholecystectomies (low-risk cases) when antibiotics were used wound infections were %2,5 and when they were not used, wound infections increased to %12,3. In our patients (low-risk cases) wound infection rate was found to be %6,6 in the prophylactic group and %23,3 in the control group, and the difference between these two groups was observed to be of significance ($P < 0,01$). We applied the recommended method in prophylaxis with third generation cephalosporin (ceftriaxone 2x1 gm. i.v.). The side effects of cephalosporins are scarce, their density in the bile are high and they have superior effects on both gram positive cocci and gram negative bacteria which are commonly observed in wound infections. Studies indicate that single dose preoperative prophylaxis was as effective as multi-doses (2-4,7).

Although appropriate dose and proper application of prophylactic antibiotics lead to very successful results, long-term applications may result in side effects as super infections, toxic effects and resistance as well as increase in costs.

In conclusion, antibiotic prophylaxis in biliary operations should be applied for low-risk group cases.

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