An Audit of antibiotic prophylaxis for laparoscopic cholecystectomy

Abstract

Background:

Laparoscopic cholecystectomy is a commonly performed surgical procedure for the treatment of symptomatic gallstones. Antibiotic prophylaxis is recommended to prevent surgical site infection (SSI) and other related complications and has been known to lower the incidence of postoperative infection in surgeries. The American Society of Health-System Pharmacists (ASHP) guideline summarizes current data on the appropriate use of antibiotic for surgical prophylaxis.

Objective:

The objective of this study is to assess and audit the use of antibiotics for laparoscopic cholecystectomy surgeries in a tertiary care center according to the recommendation of ASHP guidelines.

Methods:

A retrospective audit was conducted and medical records of patients who underwent laparoscopic cholecystectomy between August 2022to February 2023 in the surgical wards of a private hospital in Mira road, were studied . Antibiotic indication and choice, dose, dosing interval, route of administration, and timing of first administration and duration of prophylaxis were compared with the ASHP guideline recommendations.

Results:

A total of 100 patients with the age of >18 years were retrospectively studied. About 87 % of procedures had full compliance with all guideline recommendations. The variables with least compliance were “Appropriate Dose” (87% compliance rate)and “Appropriate initiation time of prophylaxis” (97% compliance rate).The variables with most compliance wereAppropriate Agent used (100%),Appropriate Duration of Prophylaxis (100%), Appropriate administration route (100%), and Appropriate decision regarding use and non-use of antibiotic prophylaxis (100%)

Conclusion:

This audit highlights the need for improved adherence to guidelines regarding antibiotic prophylaxis in laparoscopic cholecystectomy. The study revealed that most of the prescribed antibiotics for surgical prophylaxis in the hospitalare in accordance with standard treatment guideline. The density of antimicrobial use in the hospital for preoperative antimicrobial prophylaxis is as indicated/optimal.

KEYWORDS: *Antibiotic prophylaxis*,*laparoscopiccholecystectomy*, *guideline adherence*, *surgery*

INTRODUCTION

The utilization of antimicrobial prophylaxis for surgeries is one of the measures to keep the improvement of a surgical site infection (SSI).[1] SSIs altogether increase the length of hospital stay, morbidity, and mortality and along these lines deplete medicinal services framework assets.[2] Proper utilization of anti-infection agents can decrease the occurrence of SSI.[3]

In spite of the accessibility of universal and national rules for surgical prophylaxis, recent studies surveying the present routine of prophylaxis have demonstrated that overutilization of antimicrobial medications, unnecessary utilization of wide range antibacterial and wrong planning and span are still hazardous.[4,5,6,7,8,9,10] In this study, we used the guidelines of the American Society of Health-System Pharmacists (ASHP)[11] to assess the appropriateness of

antibiotic prophylaxis for cholecystectomy procedures in the large tertiary care hospital, Wockhardt , Mira Road.

METHODS

A retrospective audit was undertaken between August 2022 and February 2023 in a private hospital inMira road, a tertiary hospital with 350 beds. The files of all patients aged ≥18 years admitted for elective Laparoscopic cholecystectomy during the period, were studied.

Data was collected retrospectively from patient files and entered on the data collection forms. The following information was noted: patient demographic information (age, sex), comorbidities, ASA Score, wound class, antibiotic therapy received (agents, doses, dose intervals, route of administration, the number of doses, initiation times, and duration of administration). Compliance with recommendations of ASHP guidelines was assessed for every aspect of antibiotic prophylaxis.
The American College of Surgeons determines four classes of surgical wound types based on the wound's level of contamination: clean, clean-contaminated, contaminated, and dirty-infected.[11]
The **Inclusion Criteria** involved patients with clean-contaminated and contaminated classification of wounds.
The **Exclusion Criteria** involved patients who had dirty wounds (as antibiotic usage in this subset of patients will be counted as treatment rather than prophylaxis). Patients who received antibiotic treatment for infections were excluded, as were patients for whom it was not possible to determine whether the antibiotic was given as treatment or prophylaxis.

After Completing the data collection forms, evaluation of the data was done.
The first criterion evaluated was preoperative antibiotic prophylaxis indication; if this criterion was assessed as inappropriate, the other criteria were also considered as inappropriate.

Each record's parameters were evaluated against following criteria: Indication for prophylaxis, choice of antibiotics, time of administration of first preoperative dose, duration of prophylaxis, dose of prophylactic antibiotic and route of administration.

For patients who developed a wound infection during admission, only antibiotics prescribed before the onset of infection were enlisted; this was performed to separate prophylactic and treatment courses.

RESULTS

A total of 100 patients were reviewed in this study.All of the reviewed procedures were elective. Most of the surgical wounds were clean-contaminated (97%), and 3% were contaminated.

Table 1 shows the proportion of procedures in which the antibiotic therapy prescribed agreed with the ASHP guideline recommendation for indications and regimens of antibiotic prophylaxis.

Variables	Compliance Percentage
Appropriate agent used	100
Appropriate dose	87
Appropriate administration route	100
Appropriate initiation time of prophylaxis	97
Appropriate duration of prophylaxis	100
Appropriate decision making regarding use or nonuse of antibiotic	100
Compliance with all recommendations	87

The antibiotic used most frequently were Cefuroxime(in 82procedures, 82%), Piperacillin-Tazobactam (in 13 surgeries), Ceftriaxone-Sulbactam (in 3), Amoxicillin-Clavulanic acid (in 2), Metronidazole (as combination) in 2. Antibiotics were appropriately prescribed in 100% procedures.

Drug administration method (Intravenous)was consistent with the guideline recommendation in 100% of procedures. The dosage was

appropriate for 87 % of procedures and the duration of prophylaxis was consistent with the guideline recommendation for 100% patients. For 97 patients from a total of 100 patients, antibiotic prophylaxis was started within 60 mins before incision time. For 3 patients, prophylaxis was started >2 h before incision. The surgery duration was ~2 h in 100% of patients; andnone of them received an additional dose of antibiotic during surgery.
Out of the 100 cases, no patient had mortality and all were discharged from the hospital. Of these, all 100 patients received appropriate prophylaxis medication according to guidelines.

Discussion

The ASHP recommends prophylaxis with cephalosporin as first choice for most procedures (clean and clean-contaminated).[11] 100 % of our patients received the appropriate agent.

Use of >1 drug without any indication for multidrug prophylaxis, and use of antibiotics not recommended for prophylaxis, such as third-generation cephalosporins, are the most common errors in antibiotic selection. This misuse and overuse of antibiotics are associated with the emergence of bacterial resistance and increase in health-associated costs which was not found in our facility.

Extended use of prophylactic antimicrobials has been linked with the appearance of bacterial resistance, the risk of superinfection and drug toxicity.[12] Prophylaxis was started at the right time in most of our procedures and the duration of prophylaxis was completely in compliance with the international guidelines.

Although antimicrobial prophylaxis can decrease the incidence of SSI, this benefit must weigh against the risks of adverse drug reactions, the emergence of resistant bacteria and the direct monetary cost.[13] One potential strategy to enhance antimicrobial practice in hospitals is institutionalization, either by receiving an international guideline or by developing a local hospital guideline. Institutionalization efforts should be administered by a board of trustees that incorporates specialists, anaesthesiologists, microbiologists, pharmacists, and infection control departments. Guidelines should be based on the

hospital's specific bacterial epidemiology patterns, the best literature evidence, and surgeon'sdrug preference. The standardized protocol should then be provided to surgeons, in an effort to achieve consensus, before execution. A few studies have demonstrated that guidelines can enhance the quality of antibiotic use.

This study revealed that most of the prescribed antibiotics for surgical prophylaxis are in accordance with standard treatment guideline. A preface of local prescribing guideline together with proper educational interventions is required to improve the excellence of preoperative antibiotic use.

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