Use of prophylactic antibiotics in cholecystectomy patients: A narrative review and overview of a public tertiary hospital in São Paulo

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ABSTRACT

Cholecystitis is an inflammatory process that affects the gallbladder, usually due to an obstruction by gallstones formed inside the organ. This process may also be associated with bacterial proliferation, usually Escherichia coli or Enterococcus, which can accentuate the severity of the case and lead to worse outcomes[1,2].

Keywords: Antibiotic Prophylactic, Cholecystectomy, Postoperative Infections, Tertiary Hospital.

INTRODUCTION

Cholecystitis is an inflammatory process that affects the gallbladder, usually due to an obstruction by gallstones formed inside the organ. This process may also be associated with bacterial proliferation, usually Escherichia coli or Enterococcus, which can accentuate the severity of the case and lead to worse outcomes[1,2].

Diagnosis is usually easily guided by clinical and physical examination: the most common complaints are associated with mild to severe abdominal pain, usually associated with feeding, which is concentrated in the right hypochondrium. On physical examination, Murphy's sign may be positive and, in more severe cases, with a more evident inflammatory process, palpation of the gallbladder can be performed[3].

The infection that can be associated with the classic conditions of cholecystitis, if not adequately addressed, may have poor prognosis, with the possibility of progression to severe peritonitis and even sepsis, which substantially increases mortality rates[2].

In a first contact with the patient, where the suspicion of cholecystitis arises, it can be difficult to define whether or not there is the presence of associated bacterial contamination, since there is a possibility of fever in non-infectious cases as well. Because of this, it is necessary to be attentive to other organs and systems, because in cases of concomitant bacterial infection, the tendency is to have a more evident systemic involvement[2,3].

In cases where it is possible to identify the infection with certainty, the ideal is for the patient to receive antibiotics before performing the surgical procedure, as this ensures better postoperative results. When there is suspicion, but there is no time or resources capable of confirming the presence of bacterial infection, the decision to use antibiotic prophylaxis should be individualized and considering the risk-benefit of the patients in question[4].

Although some time ago it was considered a good alternative to perform antibiotic prophylaxis for all patients undergoing cholecystectomy, this has fallen apart in the latest updates and global consensus, with the use of antibiotics being reserved for cases of medium and severe complexity[5].

OBJECTIVES

The objective of this study is to identify in the literature of the last 10 years the main studies that provide recommendations regarding the use of prophylactic antibiotic therapy in patients undergoing cholecystectomies, elective or urgent, and, in addition, to evidence the systematic use of antibiotics in patients who underwent cholecystectomy in a hospital operated by the Unified Health System in the interior of the State of São Paulo.

METHODS

We analyzed the medical records, which contained the preoperative evolution, of patients treated at a tertiary public hospital in the interior of the State of São Paulo from January 2022 to January 2023, whose ICD (international registry of diseases) linked to care was K80 (cholelithiasis). In the mentioned period, 1744 patients with this ICD were treated.

From there, we evaluate the prescription of antibiotics prior to the surgery. The data were analyzed and tabulated in the Microsoft Office Excel 2014 software, where representative graphs were extracted from the numerical indicators obtained after collecting the information from all medical records.

RESULTS

It is observed that among the patients who received treatment with antimicrobial agents at the hospital where the data were collected, the majority (76.6%) used cephalothin, followed by cephalexin (11.7%); It can be said that both medications are used with absolutely the same purpose, with the only difference in the route of administration, being oral cephalexin and intravenous cephalothin.

The third most used drug in the preoperative period was ciprofloxacin, administered to 8.6% of the patients who underwent cholecystectomy. Ampicillin associated with sulbactam and cefepime were used, respectively, in 2.3 and 0.8% of the patients included in the study.

DISCUSSION

The end of the 1980s was marked by an important advance in medicine: laparoscopic cholecystectomy; before that, the procedure was conventionally performed through laparotomies that exposed the biliary tract almost in its entirety, providing greater risks of contamination, which left the postoperative infection rate close to 15%[6].

The use of antibiotic prophylaxis in patients who would undergo this procedure proved to be effective, reducing the incidence of infections in the postoperative period by about 10%, which confirmed the use of these medications prior to this and other biliary tract surgeries5,6.

With the advancement of the laparoscopic technique, the infection rates have been shown to be even lower, and there has been a question about the need for the use of antibiotic prophylaxis in patients who would undergo laparoscopic cholecystectomies. Several studies have been conducted since then, and the conclusion is that the use of

these medications prior to a less invasive technique was not justified, except in moderate and severe cases5,6.

To better guide the diagnosis and classification of cases of acute cholecystitis, a flowchart was created that lists signs and symptoms, and based on their presence in the patient's clinic, they classify the condition into three possible categories: mild, moderate and severe (Table 1), and the recommendation of antibiotic prophylaxis is reserved for the last two groups.

Gutt, Schlafer, and Lammert, 2020 state in their study that prophylaxis does not have concrete benefits in relation to non-use in patients who will undergo elective laparoscopic cholecystectomies, except in cases of patients who are at high risk for complications (elderly people aged 60 years or older, diabetics, jaundice, and biliary colic lasting more than 30 days)[7].

A meta-analysis with 12121 patients, published in 2018, the largest in the last 10 years on the subject, concludes that the use of antibiotic prophylaxis before laparoscopic cholecystectomies could be effective in preventing local infections, especially the most superficial, related to incision; however, there was no benefit in using it in patients whose surgical risk was low and cholecystitis had a mild degree5.

Kim et al., 2018 also highlight the biases found in the few studies that go against what is recommended by the majority. Although this study does not list the first options to be used in moderate and severe cases, there is evidence of a wide use of ceftriaxone in the studies used as a basis for the meta-analysis carried out5.

Among the references raised for this narrative review, the only one that made formal recommendations of antibiotics to be used in each case was a review article published in the Korean Journal of Gastroenterology; In the article, the authors recommend the use of cefazoline, cefuroxime, and ceftriaxone for moderate cases, and for severe infections or infections caused by nosocomial agents, they recommend the use of imipenem, meropenem, piperacycline with tazobactam, ciprofloxacin, levofloxacin, cefepime, and metronidazole3,8.

It is worth mentioning that the 2018 Tokyo Guideline, which addresses the topic, recommends maintaining this antibiotic therapy only until the end of the operative period, and should be suspended after the conclusion of the surgical procedure in mild or moderate cases, and maintained until clinical and laboratory normalization in patients with severe cholecystitis or infections by atypical or nosocomial agents3.

Regarding the data obtained after analyzing the medical records of the hospital where the retrospective analysis was conducted, there is an extensive use of antimicrobials

that are not necessarily those recommended by international guidelines, however, they have good deposition in the integument and superficial layers of the skin, which is ideal for the prevention of post-surgical infections.

CONCLUSION

It can be concluded that most of the available articles published in the last 10 years are in agreement in recommending the use of antibiotic prophylaxis only for severe or moderate cases of cholecystitis, and there is no evidence of benefit in its use in patients with mild conditions. We can also infer the distance between what is recommended and what can be performed in a public hospital, operated with SUS resources, in relation to prophylactic antibiotic therapy prior to laparoscopic cholecystectomies.

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