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Postoperative Antibiotics for Diabetic Patients with Complicated Appendicitis

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Abstract

This retrospective study, conducted at Valley Baptist Medical Center from March 14, 2020, to December 3, 2023, explores the impact of postoperative antibiotics on diabetic patients with complicated appendicitis. Out of 494 appendectomy patients, 17 diabetic patients with complicated appendicitis were analyzed. Of these, 15 received postoperative antibiotics, with 2 developing infections (13%), while the 2 did not receive postoperative antibiotics and remained infection-free. The study acknowledges limitations in sample size and the subjective nature of defining complicated appendicitis. These findings contribute to ongoing discussions on postoperative antibiotic practices, particularly in diabetic patients with complicated appendicitis.

Introduction

Acute appendicitis is one of the most common surgical emergencies in the United States and the world, with a lifetime risk of 7-8%.² The term ‘appendicitis’ is defined as inflammation of the vermiform appendix and it is divided into uncomplicated and complicated. Complicated appendicitis has previously been defined as perforated appendicitis, periappendicular abscess, gangrenous appendicitis, or peritonitis, defined as acute inflammation of the peritoneum secondary to infection of the appendix.^{3, 5} The type of appendicitis a patient is diagnosed with influences the timing of their surgery, length of stay, and perioperative management.

A surgical site infection can be superficial, deep, or an organ/space infection. A superficial infection only involves the skin and subcutaneous tissues. Deep surgical site infections involve muscles and fascial planes. Organ/space infection may involve any organ apart from the incision site, but it must be related to the surgical procedure.

The effectiveness of antibiotics in preventing postoperative surgical site infections has been controversial. The most recent evidence suggests antibiotic duration does not significantly reduce the rates of postoperative intraabdominal abscess formation in complicated appendicitis.¹ However, the current data does not address diabetic patients, who may be more likely to develop an abscess than their nondiabetic counterparts. Some surgeons do not give postoperative antibiotics after removing the source of the infection while others do, or will give antibiotics to some patients and not to others, based on their clinical judgment. Diabetes is a systemic illness that hinders the body’s ability to heal and fight infections. We hypothesize that postoperative antibiotics may be more beneficial for patients with diabetes in preventing postoperative surgical site infections in complicated appendicitis.

Methods

Data was gathered from the UTRGV Women and Surgery Clinic's electronic medical record for all patients diagnosed with diabetes and complicated appendicitis who underwent an appendectomy at Valley Baptist Medical Center in Harlingen from March 14, 2020, to December 3, 2023. Our criteria for diabetes was a previous diagnosis of type I or type II diabetes mellitus or a hemoglobin A1c of 6.5 or greater during the hospital admission for the appendectomy. The criteria for complicated appendicitis were those who had a perforated appendix, periappendicular abscess, gangrenous appendicitis, or diffuse/generalized peritonitis. Some sources include patients with regional peritonitis as complicated appendicitis, but due to the retrospective nature of this study it was difficult to determine the severity of peritonitis from the medical records, so these cases were not included. Patients who were excluded from our study were those who did not have diabetes or complicated appendicitis, patients on immunosuppressive drug therapy, dialysis, and those who underwent appendectomy as part of a larger operation, such as a bowel resection due to trauma or a small bowel obstruction. From the operative note, we looked for language describing the appendix and the surrounding tissue. Patients who were prescribed antibiotics after their operation during or after their hospital stay were identified. The medical records were examined to determine if patients developed a surgical site infection within 2 weeks of their appendectomy. The rate of surgical site infection in the group of patients who received postoperative antibiotics was determined and compared to the rate of those who did not receive postoperative antibiotics.

Results

494 patients had an appendectomy at Valley Baptist Medical Center from March 14, 2020, to December 3, 2023. 57 of the 494 had diabetes, 11.5%. Of those 57 patients who had diabetes, 21 also had complicated appendicitis, 4.25% of the appendectomy patients. 4 patients were excluded from this point: 1 because their appendectomy was part of a bowel resection surgery and they were on chemotherapy, another 2 were because they were diagnosed with end-stage renal disease and were on dialysis during their hospital admission, and 1 patient had a previous kidney transplant and was on immunosuppressive drug therapy. 17 patients with diabetes and complicated appendicitis were left after exclusions. 15 patients were given postoperative antibiotics either during their hospital stay or as a prescription to be taken after discharge. 2 were not given postoperative antibiotics after the removal of their appendix. 2 out of 15 patients who received postoperative antibiotics developed a postoperative infection 13%. The 2 patients who did not receive postoperative antibiotics both did not develop a postoperative surgical site infection, however interestingly, 1 was admitted to the hospital 4 days later for acute cholecystitis.

Category	Number of Patients
Total Appendectomy Patients	494
Patients with Diabetes	57 (11.5%)
Patients with Diabetes and Complicated Appendicitis	21 (4.25%)
Exclusions:	
- Appendectomy as part of bowel resection surgery	1
- End-stage renal disease on dialysis	2
- Previous kidney transplant on immunosuppressive therapy	1
- Patients with Diabetes and Complicated Appendicitis (After Exclusions)	17
- Patients Given Postoperative Antibiotics	15
- Patients Not Given Postoperative Antibiotics	2
- Patients with Postoperative Infection (Given antibiotics)	2 (13%)
- Patients without Postoperative Infection (Not given antibiotics)	2 (0%)

Table 1: Summary of Appendectomy Patients with Diabetes and Complicated Appendicitis

This table outlines the key outcomes of 494 appendectomy patients at Valley Baptist Medical Center between March 14, 2020, and December 3, 2023. It highlights the prevalence of diabetes, cases of complicated appendicitis, and the impact of postoperative antibiotic administration on the occurrence of surgical site infections.

Discussion

The study's major limitation lies in its underpowered sample size, limiting the ability to draw significant conclusions. There is a possible selection bias of those who are given postoperative antibiotics, therefore adequately powered randomized trials are required to prove that antibiotics do or do not prevent postoperative surgical site infection. The definition of complicated appendicitis introduces some degree of subjectivity. Perforated appendicitis is considered complicated, but perforations can be so small that they are not seen on gross inspection during surgery. For those patients who were discharged with a prescription for oral antibiotics, there is no way to know if they picked up their prescription or faithfully took the medication. There is also a possibility that some patients who developed a surgical site infection did not return to Valley Baptist Medical Center where they had their original operation, but decided to seek care somewhere else.

There is mounting evidence that is shifting practices to a more conservative approach regarding prescribing postoperative antibiotics, however, there is uncertainty about what to do with diabetic patients with complex appendicitis so surgeons use their clinical judgment.^{4, 6} The lack

of literature on this specific demographic highlights the project's potential to influence clinical practice paradigms. This retrospective study did not have sufficient power, but if a larger sample size was used, there may be enough patients to determine if postoperative antibiotics are useful in the management of diabetic patients with complicated appendicitis. Going forward, the surgery team will continue to gather data on future patients to add to the data we have so far.

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