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Original Research Article

A Randomized Controlled Trial to See if Nonperforated Appendicitis Patients Need Antibiotics Following Laparoscopic Appendectomy

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Abstract

Background: The most prevalent cause of acute abdominal pain is acute appendicitis. Prophylactic antibiotics are used appropriately to reduce the risk of postoperative surgical site infections (SSIs). However, there is no definitive rule for how long antibiotics should be used. Many randomised control trials have advised a single preoperative prophylactic dosage. As a result, the goal of the study was to see if postoperative antibiotics were required after a laparoscopic appendectomy for non-perforated appendicitis. Appendectomies for severe acute appendicitis account for about 30% of all appendectomies (CAA). Deep abscesses (12 percent of CAA cases with laparoscopy, compared 4% with open surgery) are the most common post-operative consequence.

Aim: A randomised controlled trial to see if non-perforated appendicitis patients need antibiotics following laparoscopic appendectomy. The goal of this trial was to see if postoperative antibiotics may help prevent surgical site infections (SSIs) and abscess formation after an open appendectomy.

Material and Method: A total of 100 patients with non-perforated appendicitis were separated into two groups for laparoscopic appendectomy. Patients in Group A (n=50) received a single preoperative antibiotic dose, while patients in Group B (n=50) received three preoperative and postoperative antibiotic doses. Routine tests such as a complete blood count, blood urea, and serum creatinine were performed, as well as other tests such as an abdominal ultrasound. After a laparoscopic appendicectomy, the surgical incision was checked for symptoms of postoperative SSI after 48 hours, 72 hours, and on day 7. Patients in Group A received a single dose of antibiotics (ceftriaxone and metronidazole) before to surgery, while patients in Group B received the same regimen plus antibiotics 24 hours later. Both groups of patients were followed for 30 days to see if any complications arose from the surgery.

Results: Group A had a mean age of 20.64±9.49 years, while group B had a mean age of 20.62±8.56 years. All of the participants in the research had discomfort in the right iliac fossa. Three patients in group A (6%) and two in group B (4%), respectively, had grade III SSIs, which were treated conservatively. The difference in SSI incidence between the two groups was statistically negligible.

Both groups had 100 patients and were compared in terms of baseline characteristics. There was no statistically significant difference in the rates of SSIs between the two groups. There was no intra-abdominal collection in any of the patients.

Conclusion: After appendectomy for NPA, a single dosage of preoperative antibiotics (ceftriaxone and metronidazole) was enough to reduce SSIs. In these patients, antibiotics after surgery did not provide a significant therapeutic advantage. Antibiotics given as prophylactic postoperative doses are no more effective than a single preoperative dosage in preventing postoperative SSIs after laparoscopic appendicectomy.

Keywords: Laparoscopic appendicectomy, Non-perforated appendicitis, Prophylactic antibiotics, Surgical site infection.

Introduction

The most prevalent cause of acute abdominal discomfort that necessitates surgical intervention is appendicitis, and appendectomy is the most commonly performed emergency surgery. A lifetime risk of acute appendicitis exists in up to 20% of the population. [1,2] Non-perforated appendicitis (NPA) and perforated appendicitis (PA) cases are divided into three categories: clean, contaminated, and contaminated. Preoperative prophylactic antibiotics have been shown in several studies to reduce postoperative infection problems after appendectomy. [3-5] As a result, preoperative preventive antibiotics are likely provided to all patients undergoing appendectomy in our facility. [6, 7]

The lifetime risk of acute appendicitis (AA) is estimated to be 7 to 8%. [8] Complicated appendicitis comprises approximately 30% of these patients (CAA; defined as peripheral appendicitis, extraluminal fecaliths, abscess, or local or common peritonitis). [9] Prior to surgery, appendicitis is now diagnosed as a confirmed appendicitis rather than possible appendicitis. Pre-surgical imaging (ultrasound or computed tomography (CT) scan) is a gold standard of diagnosis, and most patients have already done so. [10]

The risk of acute appendicitis is 6.7 percent in women and 8.6 percent in men, with the highest rate for both sexes between the ages of 10 and 30. [11] After appendicitis, the pathological condition of the vermiform appendix has a profound effect on the surgical site after surgery. infection (SSI). [12,13] SSIs are more common in patients with perforated or gangrenous appendicitis than in those with perforated non-perforated appendicitis. longer hospital stays, and higher costs. [14] Along with medications, surgeons have made significant and continuous efforts to prevent sepsis. Despite this, postoperative wound infection is still an important problem limiting surgery. [15] According to findings from a recent national team study, complex and simple appendicitis has different epidemiological practices over time; The researchers came to the conclusion that complex and complex appendicitis were two different diseases with non-parallel pathologies and, as a result, non-parallel treatments. [16-17]

Antibiotics given before surgery during the period of maximal bacterial contamination, i.e. during surgery, attain appropriate serum and tissue levels and play a critical role in SSI prevention. [18] However, there is still debate about the significance of postoperative antibiotics in lowering SSIs in non-perforated cases. [19] For the majority of elective general surgical operations, a single-dose antibiotic prophylaxis is advised; however, in practise, this is not followed, and multiple-dose regimens are nevertheless used at many institutions. [20] As a result, this study was carried out to see if postoperative antibiotics were required to reduce SSI after laparoscopic appendicectomy for non-perforated appendicitis.

Material and Methods

The study was conducted in the General Surgery Department. All of the participants in the study gave their informed consent in both English and the vernacular language.

Selection of Patients

After receiving approval from the Institutional Research Ethics Committee, a randomized clinical trial was conducted at the Department of Surgery. This study included all patients who were diagnosed with acute appendicitis and underwent emergency open appendectomy. Patients who took antiretroviral drugs within 72 hours arrived, were pregnant or had an autoimmune disease, had diabetes, heart disease, anemia, or had complex appendicitis (gangrenous, perforated, appendicular mass or abscess) or normal appendix all eliminated. Patients who did not return for follow-up surgery without discharge after discharge were also excluded from the study. All of the patients in this study gave their informed consent. The study included individuals of either gender who presented with uncomplicated appendicitis and were between the ages of 18 and 50.

Data collection

Ceftriaxone (1 g, IV) and metronidazole were given to all of the patients prior to surgery (500 mg). The usual operating approach was used to perform an open appendectomy through a right lower quadrant incision. After cleaning with regular saline, all of the patients' wounds were mostly closed. Patients having an intraoperative diagnosis of NPA were randomly allocated into two groups after surgery. Patients in group A were not given any antibiotics after surgery, while patients in group B were given ceftriaxone (1 g) and metronidazole (500 mg) up to 24 hours following surgery. All of the patients' appendices were sent for histopathological investigation after surgery. Both groups of patients were discharged once they were fully mobilised, afebrile, able to accept a normal meal, had normal bowel motion, and had adequate pain control.

Both groups of patients were discharged once they were fully mobilised, afebrile, able to accept a normal meal, had normal bowel motion, and had adequate pain control. Patients were instructed to return to the surgical clinic 7-14 days after discharge for a follow-up visit. Furthermore, if the patients had a fever, pain, or pus discharge from the wound, they were instructed to go to the hospital's emergency room right once. A month after surgery, a second follow-up visit was scheduled.

Redness of the wound, redness, pain, and edoma were all signs of a surgical infection (SSI). Fluid accumulation within the peritoneal cavity is defined as intra-abdominal accumulation, confirmed by ultrasonography or CT scan. All infected wounds were treated by opening a hole, smearing it with common salt, packing it freely, and using a second purpose. Demographics, clinical symptoms, temperature, and CBC at admission, duration of surgery, postoperative findings, postoperative antibiotics, and complications were all considered.

Result:

Table 1: Demographic, detailed history and clinical characteristics of the study population

Findings	Group A, n=50	Group B, n=50
Mean age	20.64±9.49	20.62±8.66
Pain	50 (100%)	50 (100%)
Fever	14 (26%)	15 (32%)
Nausea/vomiting	32 (62%)	34 (68%)

Bowel sounds	50 (100%)	50 (100%)
Total leukocyte count		
6,000-11,000	25	20
0.688 >11,000	25	29
Ultrasonography, inflamed appendix, probe tenderness	7	13
Diagnosis		
Acute appendicitis	41	43
Chronic appendicitis	7	3
Recurrent appendicitis	4	5
Sub-acute appendicitis	2	3
Histopathology report		
Acute appendicitis	42	45
Chronic appendicitis	10	7

The research subjects' demographics, full histories, and clinical features are displayed (Table 1). There was no significant difference in mean age, gender distribution, pain, fever, nausea/vomiting, McBurney's soreness, bowel sounds, total leukocyte count, ultrasonography, diagnosis, and histology report between the two groups.

Table 2: Summary of Southampton scoring.

Duration	Group N	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4 and 5
48 h	Group A	41 (84%)	7 (12%)	2 (4%)	0	0
	Group B	47 (96%)	2 (4%)	1 (2%)	0	0
72 h	Group A	41 (82%)	2 (4%)	4 (8%)	3 (6%)	0
	Group B	42 (84%)	2 (4%)	3 (6%)	3(6%)	0
7th day	Group A	48 (96%)	2 (4%)	0	0	0
	Group B	49 (98%)	1 (2%)	0	0	0

After 7, 48 hours, and day 7, the Southampton scoring system of SSIs is summarised (Table 2). None of the patients in this research developed SSIs of grade 4 or 5. Wound healing was judged normal for grades 0, 1, and 2, however wound infection was evaluated in patients with grade 3.

Discussion

SSI following surgery is a terrible problem that a patient or surgeon would have expected.[21] SSIs produced by endogenous plants are transplanted to a generally sterile area, covering about 15% of all nosocomial diseases.[22] In this large, randomised study of antibiotics for appendicitis, the results of a routinely used indicator of health status at 30 days showed that antibiotics were no better than appendectomy. By 90 days, 29% of the antibiotics group's participants had undergone appendectomy, including 41% of those with an appendicolith and 25% of those without an appendicolith. [23]

Furthermore, SSIs have a significant impact on financial stress. Davey et al. discovered a rise in hospital spending on a patient when a surgical site becomes infected in a prospective study.[22] Preoperative treatment is sufficient for all patients with

non-perforated appendicitis, according to a systematic review by Daskalakis et al, and postoperative antibiotic treatment is not recommended.[23] However, postoperative broadspectrum antibiotics are suggested in the case of perforated appendicitis. Similarly, Andersen et al. found that antibiotics are superior to placebo in minimising postoperative complications in patients with uncomplicated appendicitis; nevertheless, they concluded that no precise recommendations can be made regarding antibiotic use duration. [1] Patients with complicated appendicitis, on the other hand, should continue to get a full antibiotic regimen since they are at a higher risk of infective consequences. Only a few studies looking at clinical benefits and barriers to prescribing antibiotics after surgery in addition to appropriate prior antibiotic prophylaxis. [24] The primary purpose of these antibiotics is to reduce the risk of SSIs after surgery. [25]

Liberman et al. it was found in 1995 that patients who received only preoperative cefoxitin had a higher rate of infection (11.1%) than those who received both preoperative and postoperative cefoxitin (1.9%). As a result, they recommend a single pre-surgical dose of cefotetan as the best prophylaxis of NPA. As a result, instead of adding post-surgery antibiotics, the choice of pre-surgical antibiotic is important. [26]

Determining the appropriate timing of NPA antimicrobials, Mui et al. performed randomized trials in 269 patients. [6] They did not find significant statistically significant differences in infection rates between the three test groups. They concluded that a single preoperative antibiotic treatment was sufficient to prevent complications of post-operative infection.(6) Le et al. compared NPA patients receiving the same dose of pre-surgical antiretrovirals to those who received postoperative antibiotics more than pre-surgical antibiotics.[7] Coakley et al. recently examined the results of a large number of patients (728 patients) who were given antibiotics before and after appendectomy versus those who were given antibiotics before surgery. by increasing the rate of antibiotic-related diarrhea and the rates of clostridium cliile infection. [27]

As a result, the advantages and adverse effects of antibiotic therapy must be carefully assessed. Furthermore, recent studies have found that long-term antibiotic usage, especially in patients with complex appendicitis, does not lessen the risk of postoperative infection complications. [28,29] Our research had a number of flaws. Small sample size, no financial comparison between the two groups, no assessment of quality of life, and others were among them. [30]

Conclusion:

Overall, the findings suggest that a single pre-surgical dose of cefotaxime and metronidazole at admission is sufficient to reduce the risk of postoperative SSI, and that repeated postoperative doses do not provide significant statistical benefit. However, these findings are limited to one procedure: laparoscopic appendicectomy. To evaluate the true need for postoperative prophylactic antibiotics to decrease SSIs, more research on a wider scale with many additional abdominal procedures is needed.

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