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Postoperative antibiotic use and the incidence of intra-abdominal abscess in the setting of suppurative appendicitis: a retrospective analysis



Esther Bae, D.O.^{a,*}, Ahmed Dehal, M.D.^b, Vanessa Franz, M.D.^a,
Michael Joannides, M.D.^c, Nicholas Sakis, M.D.^d,
Joshua Scurlock, M.D.^e, Patrick Nguyen, M.D.^f, Farabi Hussain, M.D.^g

^aDepartment of General Surgery, Arrowhead Regional Medical Center/Kaiser Permanente Fontana General Surgery, 400 N Pepper Ave, Colton, CA 92324, USA; ^bJohn Wayne Cancer Institute, Santa Monica, CA, USA; ^cLSU Health Sciences Center–New Orleans, General Surgery, New Orleans, LA, USA; ^dArrowhead Regional Medical Center, Department of Internal Medicine, Colton, CA, USA; ^eDepartment of Surgery, University of Massachusetts Medical School, Worcester, MA, USA; ^fDepartment of General and Colorectal Surgery, Kaiser Permanente SCPMG, Fontana, CA, USA; ^gArrowhead Regional Medical Center, Department of General Surgery, Colton, CA, USA

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Abstract

BACKGROUND: Although guidelines exist for postoperative antibiotic use in acute appendicitis that is perforated, gangrenous, or simple/uncomplicated, there are less data about its use in suppurative appendicitis. Here, we targeted this subgroup of patients to determine whether postoperative antibiotic administration affects incidence of intra-abdominal abscess formation.

METHODS: We retrospectively examined 1,192 patients who underwent laparoscopic appendectomy for acute appendicitis at Kaiser Permanente Fontana Hospital between August 2010 and August 2013. Suppurative appendicitis was described for 143 (12%) patients. Fifty-two patients received postoperative antibiotics for at least 1 week on discharge home, 91 did not.

RESULTS: Of 143 patients with suppurative appendicitis, 1 (1.9%) who received postoperative antibiotics came back with an intra-abdominal abscess within 1 month. Of the 91 patients in the no antibiotic group, 1 (1.1%) came back with an intra-abdominal abscess.

CONCLUSIONS: The administration of postoperative antibiotic in the setting of suppurative appendicitis has no effect on the rate of intra-abdominal abscess formation. Routine postoperative antibiotics may not be necessary in this patient population, and more evidence is needed to justify its use.

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* Corresponding author. Tel.: +1-775-813-4788; fax: +1-909-427-3018.

E-mail address: estherbaedo@gmail.com

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Acute appendicitis is one of the most common causes of acute abdomen, as well as one of the most frequent indications for surgery, with an incidence of 140 per 100,000 people.¹ Appendectomy remains the standard of care, with addition of postoperative antibiotics depending on the severity of infection (ie, gangrenous or perforated).² One commonly accepted pathogenesis for appendicitis is that of obstruction of the appendiceal lumen, with progression to injected appearance and eventual gangrene or perforation due to pressure and compromise of venous outflow (and subsequent arterial inflow); this is reflected as linear progression along a spectrum of severity.³ In earlier stages, this can manifest as cloudy yellowish fluid exuding from appendix, or suppuration. This particular subtype of appendicitis is fairly common, with a reported incidence of anywhere from 10% to 50% of the cases,⁴ yet there are less published data in the literature about postoperative antibiotic use in this setting. There appears to be no established standard of care for the treatment of suppurative appendicitis, including at our institution. To address this question, we designed a study to investigate the hypothesis that postoperative antibiotic treatment for suppurative appendicitis is not necessary and its absence does not affect morbidity.

Methods

A retrospective review was conducted of patients at Kaiser Permanente Fontana Medical Center who received laparoscopic appendectomy between August 2010 and August 2013. Included were pediatric and adult patients whose appendicitis was only described as suppurative type, either on the operative note or discharge summary. Excluded were those patients who had incidental and interval appendectomies, as well as those with simple, perforated, or gangrenous appendicitis (or alternatively, any other type but suppurative, even if concurrent). Of 1,192 charts reviewed, the 143 patients with suppurative appendicitis were then divided into 2 groups based on whether or not they received postoperative antibiotics, duration of 7 days or longer. Those who only received 1 or 2 postoperative doses of IV antibiotics were included in the no antibiotics group. A small number of patients who were discharged home with several days of antibiotics were also placed in the no antibiotics group. Virtually all patients were discharged home within 24 hours of operation, as is advocated and increasingly common, already so at our institution for uncomplicated cases.⁵ All cases were completed laparoscopically as determined by inclusion criteria.

Primary outcome was development of intra-abdominal abscess within 30 days, diagnosed by CT scan. Secondary outcome was development of wound infection within 30 days, documented in follow-up progress notes.

Statistical analysis was performed using 2-tailed *t* test for continuous variables. Presence of comorbidities and

Table 1 Demographics and risk factors

Patient characteristics	Abx (n = 52)	No Abx (n = 91)	P-value
Age	32	32	.89
Body mass index	27.8	27.5	.83
Diabetes	7 (13.5%)	8 (8.8%)	.41
Hypertension	9 (17.3%)	12 (13.2%)	.62
Tobacco user	8 (15.4%)	12 (13.2%)	.80

Abx = antibiotics.

incidence of wound infection were compared using Fisher's exact test. *P* value = .05 was the upper limit for statistical significance. This study was approved by the Kaiser Permanente Institutional Review Board.

Results

The 143 patients were divided into 2 groups based on receipt of postoperative antibiotics: there were 52 patients in the antibiotic group and 91 patients in the no antibiotic group. **Table 1** shows that both groups were comparable, with a mean age of 32 years in both antibiotic and no antibiotic groups (*P* = .89) as well similar body mass index, average 27.8 vs 27.5 (*P* = .83). In addition, comorbidities were also comparably represented in both groups, 13.5% vs 8.8% for diabetes (*P* = .41), 17.3% vs 13.2% for hypertension (*P* = .62), and 15.4% vs 13.2% for tobacco use (*P* = .80). On presentation to hospital, patients in both groups had similar average white blood cell count (14.5 K vs 14.9 K; *P* = .53) but slightly higher heart rate (94 vs 87; *P* = .04) and temperature (37.2°C vs 36.9°C; *P* = .05) in group that received antibiotics. Patients who received antibiotics were symptomatic for an average of 1.6 days (vs 1.3 days; *P* = .17). Thirty-day incidence of superficial surgical site infection, or wound infection, was essentially equivalent in both groups at 1.1%, *P* = 1.00. Thirty-day incidence of abdominal abscess was also equivalent, with 1 patient in each group (in fact, the postoperative wound infection and intra-abdominal infection in the antibiotic group occurred in the same patient). The patient in each group who developed intra-abdominal abscesses returned to the hospital within a week of discharge, and both underwent drainage via interventional radiology.

Table 2 Primary and secondary outcomes

Complication	Abx (n = 52)	No Abx (n = 91)	P-value
Intra-abdominal abscess	1 (1.9%)	1 (1.1%)	1.00
Wound infection	1 (1.9%)	1 (1.1%)	1.00
Total	2 (3.8%)	2 (2.2%)	.62

Abx = antibiotics.

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