



Research Article

Non beneficence of postoperative antibiotics in uncomplicated appendicitis- A single centre retrospective study

Authors

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Abstract

Introduction: Several studies have shown benefit from use of preoperative antibiotics in reducing postoperative infection after appendectomy as well as efficacy of postoperative antibiotics in complicated appendicitis (defined as perforated appendix or presence of pus in peritoneum). While for uncomplicated appendicitis, several studies showed no benefit from antibiotics postoperatively but there are no clear NICE guidelines in UK till now and so surgeons have different practice based on their preferences.

Aim: The aim of this study is to find whether administration of postoperative antibiotics in uncomplicated appendicitis was superior to non-administration or not regarding 30-day postoperative wound infection or collection

Methods: This study included patients who had appendectomy for uncomplicated appendicitis in Worthing hospital from 1st July 2019 till 30th June 2020. The end point was 30-day follow up postoperatively for wound infection or collection.

Results: 90 patients were admitted with uncomplicated appendicitis with age 6-80 years (mean of 31.3). 46 patients (51%) did not receive postoperative antibiotics (group A) and 44 (49%) received postoperative antibiotics (group B) with a variable practice from one dose to 8-day course. postoperatively, only 1 patient (2.1%) in group A developed wound infection requiring drainage while none in group B developed complications (p-value=1).

Conclusion: Administration of postoperative antibiotics in uncomplicated appendicitis showed no superiority over non-administration. in addition, they add extra cost on NHS. So, their routine use postoperatively is not recommended, however, larger studies are required to confirm this.

Keywords: Acute appendicitis, uncomplicated appendicitis, antibiotics, postoperative wound infection.

Background

Appendicitis is one of the most common causes of acute abdominal pain and surgical emergencies and approximately 50,000 cases of appendectomies performed every year in United Kingdom^[1]. The cause of appendicitis is not largely known but in 50% of patients thought to be caused by obstruction of appendiceal lumen^[2,3]. The most common causes of appendiceal lumen

obstruction include faecolith, foreign body and rarely appendiceal or cecal malignancy (1%)^[2,3,4,5]. Obstruction of appendiceal lumen leads to increased production of mucus and appendiceal distension, bacterial overgrowth leading to suppurative inflammation which impair lymphatic and venous drainage of the appendix and finally leads to ischaemia and necrosis with possible risk of perforation^[5,6,7].

Appendicitis is classified into complicated (defined by presence of pus or perforation of appendix) or uncomplicated. The American association for the surgery of trauma classified appendicitis into 5 grades with grade I (acutely inflamed appendix, intact) and II (gangrenous appendix, intact) include uncomplicated appendicitis and grade III-V involve complicated cases^[8]. It is agreed that preoperative broad-spectrum IV antibiotics need to be administered once acute appendicitis diagnosis is made as studies have shown their efficiency in decreasing postoperative wound infections^[2,8,9,10]. It has been also found that single dose has the same effect as multiple doses and this help to reduce the cost and the risk of microbial resistance^[10].

Postoperatively, administration of antibiotics for 3-5 days is recommended in complicated appendicitis with variation in choice and route of administration^[11-15]. While for uncomplicated appendicitis, there is no evidence supporting administration of post-operative antibiotics as there is no evidence of improved clinical outcomes^[2,8,16]. But till now there is no clear NICE guidelines regarding that.

Methods

This is a retrospective study which included all patients who had appendectomy (open or laparoscopic) for uncomplicated appendicitis (defined as no perforated appendix nor pus collection) in Worthing hospital (one of Western Sussex hospitals) during period from the first of July 2019 till the end of June 2020. Patients who received postoperative antibiotics for other causes as urinary tract or chest infection were excluded. Data were obtained from medical records (admission sheets, operative notes, drug charts and discharge summaries). The clinical end point was 30-day follow up for development of postoperative wound infection or collection. Statistical analysis was done using IBM SPSS® Statistics version 22 (IBM® Corp., Armonk, NY, USA). Numerical data were expressed as mean and standard deviation & median and range.

Qualitative data were expressed as frequency and percentage. Fisher’s exact test was used to examine the relation between qualitative variables. For not normally distributed quantitative data, comparison between two groups was done using Mann-Whitney test (non-parametric t-test). All tests were two-tailed. A p-value < 0.05 was considered significant.

Results

- A total of 180 cases have been admitted to Worthing hospital with acute appendicitis during the period from the first of July 2019 to the end of June 2020. 90 patients were uncomplicated (50%) with age ranging from 6 to 80 years (mean age of 31.3). forty-six patients (51.1%) were females and forty-four (48.9%) were males. None of the patients were diabetic.
- Patients were divided into two groups: group A (46 patients) didn’t receive postoperative antibiotics while group B (44 patients) received postoperative antibiotics with variable duration ranging from one dose up to 8 days (table 1, 2).
- Antibiotics commonly used were a combination of amoxicillin, metronidazole and gentamicin (AMG) for adults and co-amoxiclav for children inside hospital and oral co-amoxiclav to take at home. For penicillin allergic patients, TMG with teicoplanin instead of amoxicillin or ciprofloxacin and metronidazole for penicillin allergic patients were used.

Table 1: Comparison between group A and group B for uncomplicated appendicitis

	Group A (n=46) No postoperative antibiotics	Group B (n=44) Postoperative antibiotics	p-value
Age (years)			
Mean ±SD	28.7±15.5	34.0±19.5	
Median (range)	24 (6-80)	30 (7-75)	0.319
Gender			
Male	23 (50%)	21 (47.7%)	
Female	23 (50%)	23 (52.3%)	0.829
Post-operative infection	1 (2.2%)	0 (0.0%)	1.000
Hospital stay (days)			
Mean ±SD	1.1±1.1	1.6±1.3	
Median (range)	1 (0-7)	1 (1-8)	0.007

SD: standard deviation

Table 2: Duration of postoperative antibiotics

Duration	Frequency	Percentage
No	46	51.1
1 dose	4	4.4
2 doses	10	11.1
3 doses	10	11.1
2 days	3	3.3
3 days	2	2.2
5 days	5	5.6
6 days	2	2.2
7 days	7	7.8
8 days	1	1.1

- Group A had a mean of postoperative hospital of 1.1 days with a range of 0-7 days while group B had a mean of 1.6 days with a range of 1-8 days (p-value of 0.007).
- Regarding 30-day morbidity (postoperative wound infection or collection), only 1 patient (2.1%) of group A developed wound infection which needed drainage while none of the patients in group B developed complications with a p-value of 1.
- The administration of antibiotics costed the hospital 288.22 pounds which is unnecessary cost. Also, increasing risk of antimicrobial resistance and exposing patients to side effects of antibiotics.

Discussion

This study included 90 patients with uncomplicated appendicitis. Almost with the same sex ratio (females 51.1% and males 48.9%). Group A (51.1%) didn't receive antibiotics and group B (48.9%) received antibiotics and it was found that administration of antibiotics didn't show any better postoperative outcomes in preventing against development of postoperative wound infection or collection (p-value of 1) which is similar to the that found in other studies like Andersen et al., Liberman et al. and Mui et al.^[10, 17, 18] which all recommended single administration of one dose of preoperative antibiotics in uncomplicated appendicitis for prevention against development of wound infection. They also proved that single dose is equally effective as multiple doses and no need for postoperative antibiotics. A systematic review by Daskalakis et al. strongly supported the administration of broad-spectrum antibiotics preoperatively in patients

with uncomplicated appendicitis and that no further antibiotics is required^[9] which is like the findings of this study.

In addition, Andersen et al. meta-analysis stated that single dose have similar effect to multiple doses which makes single dose better as it help to reduce cost, drug toxicity and risk of microbial resistance^[10] which is similar to our study where we found that non administration of postoperative antibiotics had shorter postoperative hospital stay and accordingly lower cost in terms of saving the cost of antibiotics and resources of the hospital.

Conclusion

Administration of postoperative antibiotics in uncomplicated appendicitis didn't show any superiority over non-administration of antibiotics (p-value of 1), but it showed significant impact on length of postoperative hospital stay where patients who received antibiotics had longer hospital stay (p-value of 0.007). This is associated with increased financial cost on NHS and increased anti-microbial resistance as well. In view of the above findings, their routine use postoperatively is not recommended, however, larger studies are required to confirm this.

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