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ANTIBIOTICS VERSUS APPENDECTOMY IN THE TREATMENT OF UNCOMPLICATED ACUTE APPENDICITIS

[*1]Dr. Janan Wadea Hurmiz Zora, [2]Prof. Tayeb Sabir Kareem, [3]Dr. Mohammed Niyazi Gheni

[1]MBChB FIBMS, General Surgery Department Rizgary Teaching Hospital, Erbil.
[2]MBChB FICMS FACS FRCS(Eng.), General Surgery Department, Rizgary Teaching Hospital, Erbil.
[3]MBCHB, FIBMS, FKBMS-GI & HPB Surgery, Rizgary Teaching Hospital, Erbil-Trainer in Arabic Board of General Surgery.

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***Corresponding Author: Dr. Janan Wadea Hurmiz Zora**

MBChB FIBMS, General Surgery Department Rizgary Teaching Hospital, Erbil.

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ABSTRACT

Background and Objective: Acute appendicitis is the most common cause of the acute abdomen in young adults, meanwhile appendicectomy is the traditional treatment for acute appendicitis, and recently there is an emerging support for trials of conservative management in patients with uncomplicated appendicitis. The aim of this study was to assess the efficacy of antibiotics in compared to appendectomy in treatment of uncomplicated acute appendicitis. **Patients and Methods:** This prospective study was conducted in East Erbil Emergency Hospital from December 2017 till February 2018. A total of 129 patients were allocated randomly, consisted of 75 (58.1%) female and 45 (41.9%) male, all patients who were older than 12 years and diagnosed as acute appendicitis were allocated randomly to two group 1st antibiotics who received oral and intravenous antibiotic for about 10 days, and 2nd appendectomy group who were conducted to surgery as primary treatment, follow up was done for one year. **Results:** In Antibiotic treated group 21 (32.8%) patients developed complications including 9 (14%) recurrences. Forty three (67.1%) patients experience total recovery with no complications or hospital admissions for about one year, while in appendectomy group nine (13.8%) appendixes were normal per-operatively, 10(15.3%) patients developed complications after primary appendectomy treatment including wound infection, incisional hernia and intestinal obstruction, and about 46(70.7%) patients experience total recovery with no complications or negative appendectomy. **Conclusion:** Antibiotic treatment seems to be successful option to treat uncomplicated acute appendicitis in patients diagnosed by conventional means.

KEYWORDS: Acute appendicitis; Antibiotic treatment; recurrent appendicitis; Appendectomy; Efficacy; Complications.

INTRODUCTION

Acute appendicitis is still the most common cause of the acute abdomen in young adults. It affects between 7 and 8 % of the worldwide population at some points in their lifetime and in the same way, considers one of the most common general surgical emergencies.[1]

There is no unifying theory concerning the etiology of acute appendicitis, as decreased dietary fiber and rise in the use of refined carbohydrates may have a role. While appendicitis is clearly associated with bacterial proliferation within the appendix, no single organism is responsible. A mixed growth of aerobic and anaerobic organisms is usual. The initiating event causing bacterial proliferation is controversial. Obstruction of the appendix lumen has been widely held to be important, and some form of luminal obstruction, either by a faecolith or a stricture, is found in the majority of cases.[2, 3]

Meanwhile, open appendicectomy or laparoscopically is the traditional treatment for acute appendicitis in most of

the centers to avoid perforation and it has been the initial treatment, even in cases if the diagnosis not been confirmed, calculating the low percentage of significant complications post operatively. Nevertheless, in 15% – 30% of cases the appendix is found to be normal per-operatively[4,5], but the population-based evaluations have indicated significant long-term risks following surgical exploration for appendicitis[6,7], small bowel obstruction that may need operation has been shown to occur in 1.3 % by 30 years[8], and mortality and morbidity rate to be 1.8% and 16.3% respectively.[9,10] A negative appendicectomy is particularly impeded with problems. However, in order to minimize mortality, morbidity and costs avoidance of negative appendectomies is more critical than preventing perforation.[11]

Recently there is emerging support for trials of conservative management in patients with uncomplicated appendicitis; therefore there has been increased interest in antibiotic therapy as primary treatment.[12,13], and many studies have indicated that imperforated appendicitis in children can be treated with antibiotics.[14-16]

AIM OF THE STUDY

This study aims to assess the efficacy of antibiotics in comparing with surgical intervention "appendectomy" in the treatment of uncomplicated acute appendicitis.

PATIENTS AND METHODS

This is a prospective randomized study that has been done during the period from December 2017 till February 2018, a total of 129 patients were allocated randomly from East Erbil Emergency Hospital, all patients who were older than 12 years and diagnosed as acute appendicitis were eligible for inclusion in the study. Patients that have pre-existing Immunosuppression conditions, Diabetes mellitus, pregnancy and history of previous abdominal surgery were excluded from the study.

Uncomplicated acute appendicitis is defined as the absence of any of criteria of complicated appendicitis which include generalized peritonitis and appedicular mass.

Acute appendicitis diagnosis was based on history, physical examination and laboratory tests (white blood cells and urine analysis) as well as ultrasonography. After the final diagnosis has been decided the patients were divided randomly in to two groups according to patients' number (odd and even).

The Antibiotics-treated group (mentioned as ABG): Patients with even number were allocated in this group. They were treated with antibiotics as primary treatment; the clinical status had been monitored during the admission period which was 24 to 48 hours.

If the condition deteriorated or there was suspicion of perforation or peritonitis then urgent surgery was performed. The conservative treatment includes injecting intravenous antibiotic "Cefotaxime 1 gm 12 hourly and Metronidazole 500 mg 8 hourly for two days followed by oral antibiotic Cefixime 500 mg once a day and Metronidazole 500 mg 8 hourly for 8 days after discharging the patient, the total number of treatment days were ten days.

The appendectomy-treated group (mentioned as APG): Patients with odd number allocated to this group. They were treated with appendectomy as primary treatment, they received a single dose of intravenous antibiotics (Cefotaxime 1 g and Metronidazole 500 mg) for at least 12 hours preoperatively with intravenous fluids but no oral intake then to undergo classical appendectomy, through grid-iron incision, open technique "using McBurney point as an anatomical landmark".

The primary endpoints of treatment are the treatment efficacy success of antibiotic-treated group that is definite improvement revealed by the resolution of Acute Appendicitis through using antibiotic as the primary treatment leading to discharge from the hospital with no need for surgical intervention and not be diagnosed as recurrent appendicitis during a minimum one year of follow-up and efficacy success of Surgery-treated group which is confirmed inflamed appendix per operatively with no complication postoperatively within same period.

While the secondary endpoints were.

- Conversion of conservative treatment to urgent operation
- Recurrence of acute appendicitis after conservative treatment during follow up period
- Post-operative complications including wound infection, incisional hernia and subacute intestinal obstruction
- Normal appendix that found per-operatively

Recurrence appendicitis diagnosed clinically and treated either conservatively or surgically.

The data collected by a special datasheet form including demographic information and all events that is related to the condition and the way of treatment.

Patients follow up done by outpatient visits or phone call (for those who could not attend) at 10 days, one month, six months and one year after the hospital discharge. During follow up we looked for any complications like wound infections postoperatively and recurrent Acute Appendicitis in the antibiotic-treated group.

Informed Consent was taken from the patients.
Statistical calculation of the data was done was using Microsoft Excel program 2010 and P values was

determined using two-tailed tests "P value < 0.05 is used as the cutoff for significance". This study was approved by the ethical committee in Hawler medical university.

RESULTS

This randomized study included (129) patients, consisted of 75 (58.1%) female and 54 (41.9%) male, (female to male ratio 1:1.38) (Figure 1) with age ranged from 14 to 41 years, mean age was 26.7.

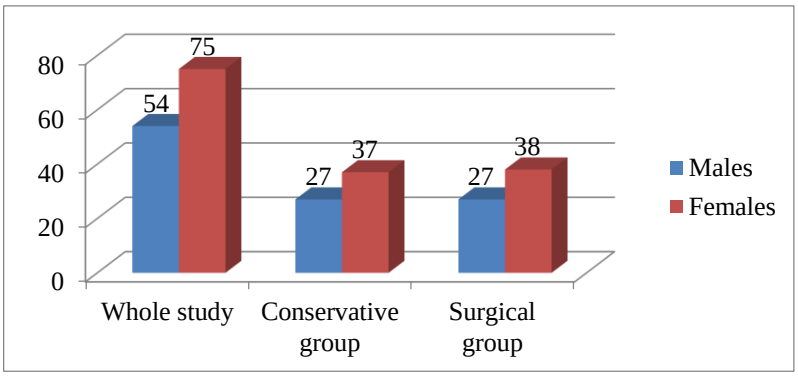

Figure (1): Gender distribution of the allocated patients in both groups.

The mean age in APG was 26.9 years and in ABG was 26.4 years, on the other hand female: male ratio 1:1.4 and 1: 1.37 respectively. (Table 1 &2) shows the age distribution among participants and most of patient with acute appendicitis are in age group that ranged between 21-30 years.

Table 1: Age distribution among participants.

Age	Frequency n	Percentage (%)
12-20	37	(28.7)
21-30	42	(32.6)
31-40	39	(30.2)
41-50	11	(8.5)
Total	129	(100

Table 2: Age distribution among both groups.

Groups	Age	Frequency n	Percentage (%)
Antibiotic treat group	12-20	17	(26.5)
	21-30	23	(35.9)
	31-40	20	(31.2)
	41-50	4	(6.2)
	Total	**64**	**(100)**
Appendectomy treated group	12-20	20	(30.7)
	21-30	19	(29.2)
	31-40	19	(29.2)
	41-50	7	(10.7)
	Total	**65**	**(100**

In ABG, 21 (32.8%) patients developed complications as conversion to open appendectomy or developing recurrent appendicitis was showed in Table (3). Those patients who underwent appendectomy after failure of antibiotic therapy were 12(18.7%), seven of them had severely inflamed appendix, In three of them there was appendicular mass while perforated appendix found in two of them, nine patients were admitted again to the hospital after discharge for the same condition and were diagnosed as recurrent appendicitis, One-third of the recurrences appeared within first month after hospital discharge and two-thirds between 3 and 12 months from discharge with mean 4.6 months. Relapsing patients were both men and women aged between 14 and 36 years, All of them were treated surgically "appendectomy" either by open or laparoscopy method.

In total, 43 (67.1%) patients experience total recovery meaning there was no complications related to antibiotic treatment or hospital admissions for about one year.

Table 3: Complications after primary antibiotic treatment.

Complications			Frequency (no.)	Percentage (%)
Urgent appendectomy	Severely inflamed	7 (58.3)	12	(18.7)
	Appendicular mass	3(25)		
	Perforated appendix	2(16.6)		
	Total	12 (100)		
Recurrent appendicitis			9	(14)
Total			21	(32.8)

In APG, per operatively 9 (13.8%) appendixes were obviously looking normal with no fecolith and 10 (15.3%) patients developed complications after the primary operation of appendectomy as in (Table 4) that shows the number and percentage of each complication. The wound infection was diagnosed clinically" edematous and erythematous wound edges, discharged pus and fever", all of the patient had the infection in the first 10 days after the operation with average 6.5 days post op, and were treated by broad spectrum intravenous antibiotics with daily dressing while in 5 of them culture and sensitivity test was done and were treated according to the test with daily dressing, their recovery period was between 7 to 10 days, six of them had recovered after the antibiotic period while the treatment duration was prolonged in one of them to 14 days, two patients suffered symptoms of intestinal obstruction were admitted to hospital and treated conservatively and then discharged after 3 days while one patient had incisional hernia and he was scheduled for surgical repair later on.

The efficacy in ABG was 43 (67.1%) while in APG was 46(70.7%), There was a statistically no significant difference between both group complications, *p-value = 0.6.*

Table (4): Complications after primary appendectomy treatment.

Complications	Frequency (no.)	Percentage (%)
Wound infection	7	(10.7)
Incisional hernia	1	(1.5)
Sub-acute intestinal obstruction	2	(3)
Normal appendixes	9	(13.8)
Total	19	(29.2)

Mean duration of hospital stay in ABG group was 1.6 days while in APG was 2.1 days. Those who had appendectomy during antibiotic treatment mentioned as failed cases stayed in the hospital for a median of 3.5 days (Figure 2).

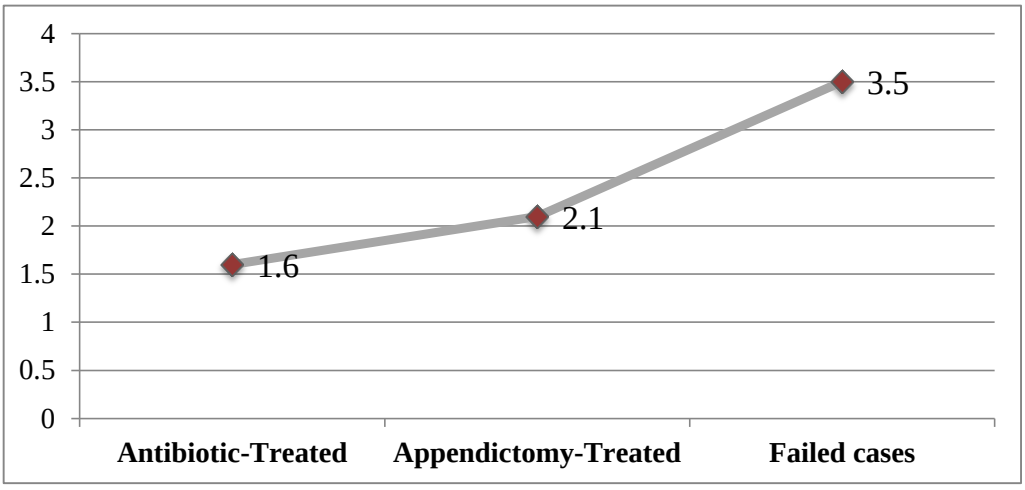

Figure (2): Duration of hospital stay in days.

DISCUSSION

This study compares between antibiotics and surgery to treat acute appendicitis found variable treatment efficacies: 67.1 % for antibiotic therapy and 70.7% for surgery (there was a statistically non-significant difference between both group complications, ***P** value = 0.6*). Major complications were (15.3%) in those had an appendicectomy with (13.8%) normal appendixes found per-operatively.

Recurrence of appendicitis after appendectomy is quietly impossible without putting in mind the stump appendicitis[17] but Surgery has its mortality and morbidity rate that cannot be ignored or abolished, On the other hand a rate of (14 %) who received antibiotics had a recurrence of the same condition.

The diagnosis of acute appendicitis is usually difficult to make and remains a vague clinical debate largely[18], therefore suspicious diagnosis may lead to delay in treatment or negative surgical exploration, leading to more morbidity associated with this condition.

As mentioned before that appendicitis may be due to bacterial infections, so it should be accepted to treat acute appendicitis with antibiotics rather than attempting appendectomy, if infection were the causative reason of it.

Thus, antibiotics offer the opportunity to treat acute appendicitis completely. There are many different types of antibiotics with multiple combinations, which can be applied in the treatment of appendicitis. Considering the treatment cost and efficacy intravenous Metronidazole and Cefotaxime for two days then followed by oral Cefixime 500 mg may be on one of the suitable option given for the coverage of aerobic gram-positive and gram-negative bacteria.

In 2009 a prospective multicenter randomized trial was presented by Styrud et al. 252 male patients aged between 18-50 years that were clinically diagnosed as appendicitis, without any suspicion of perforation were included in the study. The recovery rate of the antibiotic-treated patients was 88% while the recurrence rate within follow-up period that is one year was 14% and the complication rate in the surgery group was 14%. The antibiotic regimen was amoxicillin plus clavulanic acid (3 g per day) for 8-15 days and concluded that acute non-perforated appendicitis can be treated successfully with antibiotics5 while a literature search using MEDLINE and the Cochrane Library identified studies published between 1999 and 2009, and all relevant articles were reviewed with final conclusion was to support that appendectomy remains the gold standard of treatment for acute appendicitis based on the current evidence.[19] However, eight meta-analyses, of the randomized control trails comparing antibiotics with surgery have been published during recent years[20-22], but the conclusions in these summaries didn't reach an acceptable agreement among them.

European practices proposed that starting with antibiotic as primary treatment worth consideration, especially in a patient who has had prior surgical complications and has a strong preference for avoiding appendectomy.[23,24] Deciding which is superior Surgery or antibiotics remains a debate issue.

CONCLUSION

This study demonstrated that antibiotic treatment seems to be an appropriate and successful option to treat uncomplicated acute appendicitis in patients diagnosed by conventional means which is depends highly on particular practice and experience. Keeping in mind the risk of recurrent appendicitis associated with conservative method, meanwhile carefully diagnosing and selecting the patients to be treated with antibiotics minimize the mortality and morbidity rate related to the conventional surgery and it is cost effective for the patient and hospital. Although appendectomy remains the recommended treatment for appendicitis, surgeons should inform selected patients about the evidence related to conservative option.

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