

Proper Pre-Operative Observation Time reduces the Incidence of Unnecessary Appendectomy in Managing Suspected Acute Appendicitis in Children

OSAMA ISMAIL AL-MASHHADANY¹; AL ANI, MUATAZ²; ALIKHAN SAFIRA³; QASSID LAYTH⁴; AL-KZAYER LIKA'A⁵

¹Assistant Professor, Ped. Sug. College of Medicine, University of Nineveh, Iraq,

^{2,3}F.I.B.M.S., Al-Khansa Teaching Hospital, Department of Pediatric Surgery, Mosul City, Iraq.

⁴Assistant Professor, College of Medicine, University of Nineveh, Mosul City, Iraq

⁵M.D, PhD., Al-Khansa Teaching Hospital, Department of Pediatric Surgery, Mosul City, Iraq

Correspondence to Dr. Osama Ismail Al Mashhadany, E mail: dr.osamaalmushhadany2020@gmail.com.

ABSTRACT

Aim: To evaluate the effectiveness of routine preoperative medical management in patients with suspected appendicitis in our institution.

Methods: A Descriptive study design; a prospective study was performed during the period from June 2016 to June 2018, at the Pediatric Surgery Center in City of Mosul, Iraq. 160 patients admitted at the pediatric surgery center in Al-Khansaa teaching hospital with initial diagnoses of acute appendicitis. In this descriptive study, patient age, gender, chief complaint and duration, signs, and symptoms recorded. White blood cell counts and U/S tests are done. All patients observed for 16-24 hours. Then, those patients diagnosed with appendicitis requiring surgery were managed by either open or laparoscopic operation. Post-operative complications were recorded.

Results: After 16-24 hours of observation with antibiotic cover and IV fluid use, 49 patients were excluded due to improvement of abdominal pain, discharged home within 48 hours on oral antibiotics for 7-10 days, and followed for 6-12 months three of the 49(6%) excluded patients who underwent appendectomy within the follow-up period. Furthermore, 30% of included patients improved on conservative measures, and 111 underwent surgery. In (65 percent) patients without treatment failure or recurrence throughout the follow-up period of 6 months, conservative treatment has been successful.

Conclusions: The current study concluded that the use of antibiotics in the treatment of acute appendicitis without complications could reduce the financial costs and human resources needed for surgical intervention.

Keywords: Acute appendicitis, laparoscopic appendectomy, pre-operative observation

INTRODUCTION

A common condition in the pediatric population is Acute appendicitis (AA), responsible for one to two cases per ten thousand children under the age of 4. Immediate diagnosis and treatment are essential to avoid severe complications (such as abscess development, and bowel obstruction) and sequelae that pose a danger to life, including peritonitis and sepsis^{1,2}. In a twelve-years analysis, 1836 pediatric annexes were studied. Three hundred and twenty patients (17%) were under five years of age, (5%) less than three years of age, and just seven (0,38%) under one year old³. The high occurrence of childhood appendicitis and its significant morbidity in perforation setting make prompt diagnostic accuracy significant. Nonetheless, it is difficult to differentiate appendicitis from many of the non-operative causes of abdominal pain in children both because it is complicated and interacts with children and because it may be different from a typical presentation of present appendicitis⁴. Of the abdominal surgery performed worldwide, the most common is appendectomy^{5,6}. A delay in diagnosing AA, particularly in young children, is known to be associated with perforation and many complications^{7,8}.

Although appendectomy is universally accepted as the treatment of choice, there is debate as to how quickly a person with appendicitis requires surgery to prevent drilling and post-operative complications^{9,10}. Evidence indicates that conservative treatment is an alternative to surgery for acute, uncomplicated appendicitis (AUA)^{11,12}.

For uncomplicated appendicitis, antibiotics are known to be helpful¹³. This study aimed to explore the effectiveness of non-operative managements of uncomplicated acute childhood appendicitis.

PATIENTS AND METHODS

The study was descriptive (prospective) conducted at the Pediatric Surgery Center in City of Mosul, Iraq, between June 2016 and June 2018 to investigate cases with an initial diagnosis of acute, uncomplicated, non-complicated appendicitis admitted to Pediatric Surgery Center. The Medical Ethics Review Committee approved the study protocol of the Medical colleges. Patient age, gender, chief complaint and duration, associated symptoms, and clinical signs were recorded. Investigations, including white blood cell count, urine examination, and sonographic examination, were performed for all patients. Family histories of AA were recorded. Patients With clinical and radiological features of complicated appendicitis were excluded from the study. Informed consent was obtained from families agreeing to initial conservative treatment. Who refused excluded from the study, and those who agreed managed by intravenous fluid and antibiotics (third-generation cephalosporin and metronidazole) and observed for 16-24 hours? Serial clinical examinations were done every 4-6 hours with or without ultrasound examination. Patients for whom surgery was indicated underwent either open or laparoscopic operation. Duration of hospital stay and postoperative complications were also

recorded. Those who improved on conservative measures were discharged on home parenteral antibiotics for a total of 3 days, then oral antibiotics for another 5-7 days with frequent clinical checking or by mobile phone contact to determine whether they developed similar conditions or needed an appendectomy within 6-12 months after discharge. The data were analyzed by SPSS version 25 & 21. All variables were used with concise statistics, including mean, standard deviation, median, and percentiles.

RESULTS

A total of 160 patients with an initial diagnosis of uncomplicated AA were included in this study. Among the participants, 96 (60%) were boys, and 64 (40%) were girls. The age of our patients beyond to 3-14 years, with ten (6%) <5 years of age, 67 (42%) between the ages of 5-10 years, and 83 (52%) between the ages of 11-14 years; clearly, most of the patients were of school-age (6-14 years) (94%) (Table; I). The majority of patients 120(75%) presented between 24 and 72 hours after symptom onset, and 34 patients (21%) presented within 24 hours of symptom onset. Only six patients (4%) presented with symptoms lasting more than 72 hours. Acute abdominal pain was the chief complaint of all participants. Eighty-eight patients had localized pain in the right iliac fossa (55%), and the remaining 72 (45%) patients had central abdominal pain that shifted to the right iliac fossa at presentation. The next most common symptom was anorexia, which occurred in 118 (74%) patients. Vomiting occurred in 96 (60%), and fever >38 °C was seen in 83(52%) patients (Table 1). White blood cell counts were measured for all patients, of whom three (3%) had leukopenia (<4000 percent), (44%) had a normal range count (4000-10000), and (53%) had apparent leukocytosis (>10000 cell count) (Table: II).

Table I: Distribution of gender, age, and duration of symptoms of patients

	No.	%	
Gender	Male	96	60
	Female	64	40
Age	< 5 Years	9.60	6
	5-10 Years	67.20	42
	10-14 Years	83.20	52
Duration of Symptoms	>72hrs. (4-10) days	8	5
	Within 24 hrs.	33.60	21
	24-72 hrs.	118.40	74

Table II: Clinical presentation of patients.

Symptoms and Signs	%
Localized abdominal pain	55
Shifting pain	45
Anorexia	74
Nausea and vomiting	60
RIF tenderness (localized)	94
Generalized tenderness	6
Rebound tenderness	81
Fever > 38 °C	52

After 16-24 hours of observation with antibiotic cover and IV fluid use, 49 patients were excluded due to improvement of abdominal pain, discharged home within 48 hours on oral antibiotics for 7-10 days, and were followed for 6-12 months. Three of the 49(6%) excluded patients who

underwent appendectomy within the follow-up period. Furthermore, 30% of included patients improved on conservative measures, and 111 underwent surgery. In (65 percent) patients without treatment failure or recurrence during the follow-up period of 6 months, conservative treatment has been successful. (Table III)

Table III: Effect of conservative management

Outcomes	%age
Cured	65
Treatment failure	15.3
Recurrences	19.7

DISCUSSION

Abdominal pain is one of the most common factors for emergency admission, accounting for about 8% of all US hospital visits. The emergency intake of the acute abdomen in the City of Mosul is very small. Our results demonstrated that the majority of the patients in the current study were school-aged children, with 94% of patients being between the ages of 5-14 years; 42% were aged 5-10 years, and 52% were 11-14 years of age. The literature reviewed the correlates. Gardikis et al. reported that the annual incidence of AA was significantly higher in school-aged than in pre-school-aged children¹⁴. Wilson et al. concurred with this result¹⁵. Chang et al¹⁶ estimated that 84.6% of the patients had over five years, with median patient ages 10.4 years, which is close to the current average patient age (9.6 years) and not far from those registered by Williams et al. (10 years) and Ann M. Kosloske et al¹⁷. (9.6 years) in the current study. Only 6% of the current patients were preschool-aged (below five years). The reported percentage of AA at this age ranges from 4.5% to 15.6%. Surana et al. reported 6.6%, and Uba et al¹⁸ reported higher percentages (14.6%). The youngest patient in the current study was three years old. AA was reported in infants, even in neonates, but those patients usually presented with complicated appendicitis and, thus, were excluded from the current study³. The efficacy and effectiveness of conservative antibiotic treatment for AUA in children were evaluated using defined guidelines. In the present study, 160 AA children were eligible for conservative management. For these, (86.8%) completed conservative antibiotic treatment with a median 11-month follow-up and were performed without surgery. However, no appendix perforation was observed in the failed conservative antibiotic treatment children. If recurrent appendicitis is considered separately, we may find our success rate higher. The success rate for the conservative antibiotic treatment is 65%, with (19.7%) of children with recurrent AA, 30 of whom had a second conservative antibiotic treatment success. Talan et al¹⁹ are reporting the findings of a trial pilot assessing the efficacy and effectiveness of non-operative antibiotic care for pediatric and adult non-perforated appendicitis patients at a single medical center in the USA. The authors conclude that their pilot evidence supports the safety of this therapeutic alternative and emphasizes the importance of further non-appendicitis management trials in a full, randomized trial. The primary outcome of this analysis was the 30-day maximum complication rate, based on the criteria of the American College of Surgery Quality Improvement

Programme. Many secondary consequences, including quality of life and duration of stay in the hospital, were considered for both studies as well as non-appendectomy rates (failure and recurrence rates). In a recent European longitudinal study of nonoperative treatment of children with uncomplicated AA, 60 percent (3/5) of the was going to appendectomy²⁰. Gedam et.al. (17) Concluded in their study that performed in India, the conservative treatment in a simple AA and was conducted for two years in a tertiary care academic hospital. Some of the cases can be successfully treated with conservative care, preventing appendectomy and its associated morbidity and mortality. Conservative care, however, includes monitoring and re-evaluation of patient health conditions in order to recognize a health progress deficiency that needs to be addressed rapidly with surgery. Main admission treatment failure and short-term recurrence after conservative care are small and appropriate. Abeş and colleagues stressed a longitudinal study of 136 children diagnosed with AA. Furthermore, confirmed by U / S. 38 among them, 16 patients with a history of abdominal pain were chosen for treatment with localized abdominal tenderness and hemodynamic stability for less than 24 hours. This approach was effective for all except one. Among these cases, 41 had appendicitis perforated. The remaining 79 patients did not meet the requirements for inclusion. Since this was a retrospective study, it was not clear whether such inclusion requirements were used or whether this approach failed in the future. It is also not specified how the preoperative appendicitis diagnosis was made¹⁸.

CONCLUSIONS

The current study concluded that the use of antibiotics in the treatment of AA without complications could reduce the financial costs and human resources needed for surgical intervention. The initial results presented by the current study indicate the safety of the non-surgical intervention and that there is a need for further future studies with larger samples to verify non-surgical methods in the treatment of AA. These prospective trials will hopefully provide families with the data they need to choose how to treat their children with appendicitis. For some, avoiding anesthesia, surgery, and potential complications will be important factors, while for others, a definitive, durable treatment will be more critical.

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