Conservative Treatment in Acute Appendicitis

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ABSTRACT

Introduction: Acute appendicitis is one of the commonest surgical problems and appendectomy is one of the most commonly done operations in the emergency world wide. Though there have been occasional reports with conservative treatment in acute appendicitis, it is not being practiced as a routine.

Methods: All patients between ten to sixty years of age admitted at BPKIHS with the diagnosis of acute appendicitis over a period of one year were enrolled in the study. After taking informed consent the patients were managed conservatively. Those who did not respond to antibiotics within 24 hours were operated. Total hospital stay and complications were recorded and they were followed up at first week, sixth week and sixth month. The success rate, conversion rate, recurrence rate and morbidity and mortality pattern were assessed as the final outcome of conservative treatment of acute appendicitis.

Results: A total of 96 patients (48 males and 48 females) underwent conservative treatment. The conservative treatment was successful in 79 (82.3%) cases and failed in 11 (11.4%) cases, which included: conversion to appendectomy during conservative treatment period 4 (4.2%) cases, recurrence 7 (7.3%) cases. There was no mortality in this study.

Conclusion: Acute appendicitis can be treated successfully with conservative (antibiotics) treatment with a short hospital stay. Though there is a risk of recurrence in some cases, all the complications after appendectomy can be eliminated with the conservative treatment.

Keywords: acute appendicitis, appendicular lump, conservative management

INTRODUCTION

Acute appendicitis happens to be the commonest surgical problem world wide. Approximately 7 percent of the population will have appendicitis in their lifetime, with peak incidence occurring between the ages of 10 and 30 years.¹

There have been occasional reports with conservative treatment with antibiotics in acute appendicitis.²⁻⁵

Treatment with antibiotics resulted in significantly less pain compared to open appendectomy.⁶ However, there is a risk of recurrence in case of acute appendicitis, and this risk should be compared with the risk of complications following appendectomy. Active observation has yielded a consistently low negative appendectomy rate without a rise in the perforation rate.⁷

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Though appendectomy is an established standard treatment for acute appendicitis, it is a big burden to health system which consumes a large amount of health resources. This can be eliminated if conservative treatment is comparable and successful. Therefore, in this clinical context, we conducted this study to know the outcome of conservative treatment in cases of uncomplicated acute appendicitis.

METHODS

A hospital based prospective cross sectional study was conducted in the Department of Surgery at BP Koirala Institute of Health Sciences, Dharan, Nepal July 2006 to June 2007. The study was approved by ethical committee of our institute. The study included all the patients who were between 10 to 60 years of age and admitted in the hospital with diagnosis of acute appendicitis. The patients were examined by the same surgeon before inclusion in the study group. Patients with suspected appendicular lump or abscess, appendicular perforation with peritonitis, recurrent acute appendicitis and those with co-morbid conditions like diabetes mellitus and hypertension were excluded from the study. The investigations such as total leucocyte count, differential leucocyte count, microscopic examination of urine, ultrasonography (USG) of the abdomen were done depending on the need. Informed written consent was obtained from the patient.

As a part of our conservative management, patients were kept nil per oral; intravenous fluids were given according to body weight; injection ceftriaxone (Xone; Alkem, Daman, India) 1 gm I/V twice daily, injection metronidazole (Metron; Alkem, Daman, India) 500 mg I/V thrice daily and injection diclofenac (Voveran; Novartis, Pune, India) 75 mg I/M thrice daily were given for duration according to the response (usually 2 days).

Patients were evaluated for increase or decrease in intensity of pain, temperature, abdominal tenderness, development of appendicular lump, development of features of peritonitis every 6 hourly. Those who improved were given liquid to soft diet, antibiotics: tab cefixime (Oratax; Alkem, Daman, India) 200 mg twice daily and tab metronidazole (Metron; Alkem, Daman, India) 400 mg thrice daily, and analgesics: tab diclofenac (Voveran; Novartis, Pune, India) 50 mg thrice daily. The patients were discharged on next day allowing normal light diet and antibiotics for a period of one week (total ten days). Total hospital stay (from presentation in emergency room till discharge from hospital in days) and complications if any were recorded.

Those who were not improved with antibiotics within 24 hours were operated and operative finding were

recorded in detail. Patient was discharged when his or her conditions were satisfactory. Total hospital stay and post operative complications if any were recorded (as per proforma).

Follow up of all the patients were done in first week, sixth week and sixth month. During each follow up detail history regarding similar type of pain as in the past, vomiting, nausea were taken and abdominal examination for tenderness, rebound tenderness any lump were recorded. Investigations were done if there was abdominal finding on clinical examination. All patients who came with recurrent appendicitis were operated and findings were recorded.

The collected data were entered in computer using MS excel program 2007. The analysis was done by using appropriate software Statistical package of social sciences (SPSS). Statistical analysis was performed to calculate the outcome in percentage.

Figure 1. Flow diagram describing the study population, management, outcome and follow up of the enrolled patients.

RESULTS

This prospective hospital based study included 96 patients who were diagnosed as acute appendicitis and treated conservatively. Out of 96 patients in our study, there were 48 males and 48 females. The male to female ratio (M: F) was 1:1. The age of the patients ranged from ten years to sixty years. The mean age of the patients in the study was 25.96 years with SD11.99. Most of the patients in our study were between ten and thirty years of age.

The most frequent symptom was pain in right iliac fossa which was present in all the patients (100%). The next common symptom was vomiting in 57 (59.3 %) cases, followed by anorexia in 54 (56.2%) cases, nausea in

45 (46.7%) cases and fever in 21 (21.8%) cases with maximum temperature up to 101.0 F. All of the 96 patients had Mc Burney's point tenderness and rebound tenderness in right iliac fossa (100%). Cough sign and Rovsing's sign were present in 94 (97.9%) and 70 (72.9%) patients respectively.

The total leukocyte count (TLC) ranged from 1400/cmm to 27400/cmm and mean and standard deviation was 14023.96 (± 4376.61). The TLC $< 10,000$ /cmm was observed in 19 (19.4%) patients, count between 10,000 to 20,000/cmm was observed in 72 (75.4%) patients and count $> 20,000$ /cmm was observed in 5 (5.2%) patients. Neutrophilia of $> 75\%$ was found in 63 (65.62%) patients while 33 (34.38%) patients did not have the raised neutrophils. Ultrasonogram was performed in 69 (71.9%) patients and in 48 (69.56%) patients it was suggestive of appendicitis. In 21 (30.44%) patients ultrasonogram could not diagnose acute appendicitis.

Mean period of administration of intravenous antibiotics was 2.49 ± 0.58 days (range 1-4 days) according to the response which was followed by oral antibiotics for 7.50 ± 0.58 days (range 6-9 days) (Table 1).

Table 1. Duration of getting antibiotics and analgesics

Route of administration	Mean $\pm$ SD	Minimum Days	Maximum Days
Antibiotics:			
IV Antibiotics	2.49 ± 0.58	1	4
Oral Antibiotics	7.50 ± 0.58	6	9
Analgesics:			
IM Analgesics	2.36 ± 0.55	1	3
Oral Analgesics	3.06 ± 0.45	2	5

Mean duration of requirement of intramuscular analgesics was 2.36 ± 0.55 days (range 1-3 days) which was followed by oral analgesic for 3.06 ± 0.45 days (range 2-5 days) (Table 1).

Table 2. Treatment response within 24 hours

Symptoms & signs	Response	6 hour NO. of patients (%)	12 hour NO. of patients (%)	18 hour NO. of patients (%)	24 hour NO. of patients (%)
Pain	Absent	-	1 (1)	5 (5.2)	20 (20.8)
	decreased	2 (2.1)	19 (19.8)	63 (65.6)	74 (77.1)
	Same	94 (97.9)	75 (78.1)	26 (27.1)	-
	increased	-	1 (1)	2 (2.1)	2 (2.1)
Appetite	Yes	-	18 (18.8)	53 (55.2)	94 (97.9)
	No	96 (100)	78 (81.3)	43 (44.8)	2 (2.1)
Abdominal finding	Soft	8 (8.2)	33 (34.4)	76 (79.2)	84 (87.5)
	RIF Tenderness	88 (91.7)	62 (64.6)	12 (12.5)	4 (4.2)
	Appendicular lump	-	1 (1)	8 (8.3)	8 (8.3)

All the patients in our study were admitted and managed conservatively. They were observed every six-hourly for pulse, temperature, intensity of pain, appetite and abdominal findings such as right iliac fossa (RIF) tenderness and appendicular lump. Within 24 hours, 20 (20.8%) patients became absolutely pain-free, 74 (77.1%) patients had decreased intensity of pain and 2 (2.1%) patients had increased intensity of pain (30 years/male and 47 years/female, they were operated).

Ninety-four (97.9%) patients had a return of appetite within 24 hours. Within 24 hours, the abdomen became soft in 84 (87.5%) patients, there was tenderness in the right iliac fossa in 4 (4.2%) patients out of which two patients improved with conservative treatment but two patients needed appendectomy (the above mentioned two patients).

In our study, 8 (8.3%) patients developed appendicular lump in 24 hours, out of which two patients needed appendectomy, one on fifth day (10 years/female) and another on ninth day (14 years/female). The remaining six patients who developed appendicular lump improved with conservative treatment (Figure 2, Table 2).

Figure 2. Pattern of pain within 24 hours

Out of 96 patients in our study, three patients were operated during the same hospital stay (two after 24 hours and one on fifth day of hospital stay). Rest of the 93 patients came for follow-up in first week, out of which 91 patients had no complaint, one patient (14years, female) had pain abdomen and findings were suggestive of acute appendicitis. She was operated (on ninth day of initial treatment). Another (26years, male) presented with pain abdomen and right iliac fossa lump. The findings were suggestive of appendicular lump. As he did not improve with conservative treatment at that time, he was operated (on twelfth day from initial treatment).

During sixth week, 90 patients came for follow-up. Out of 90 patients 81 patients had no complaint, nine patients complained of pain abdomen. Out of those nine patients seven were normal and two patients (18years/female and 22years/female) had findings suggestive of acute appendicitis and they were operated.

Two patients in our study came with feature of recurrent acute appendicitis; one (26 years/male) on twelfth week and another (30years/female) on thirteenth week and they were also operated.

On sixth month 81 patients came for follow-up. Out of 81 patients 79 patients had no complaint and two patients (42 and 27years males) complained pain abdomen. They had findings suggestive of acute appendicitis. Those patients were operated (Table 3).

Table 3. Follow up of conservative treatment

Variables	1 st week	6 weeks	6 months
Normal	91	81	79
Pain abdomen	1	9	2
Pain abdomen with lump	1	0	0
Loss of follow up	0	1	5
Total	93	91	86

In our study out of 96 patients, conservative treatment was successful in 73(76%) patients. Eight (8.3%) patients developed appendicular lump during treatment. Out of those who developed lump two patients needed appendectomy. The remaining six patients who developed lump were managed successfully with conservative treatment and there was no recurrence in this group of patients during our follow up period (six months). Therefore, total 79(82.3%) patients were treated successfully with our conservative treatment (73+6 patients). Six (6.3%) patients did not complete the follow-up (one after first week and five after sixth week).

Seven (7.3%) patients developed recurrence (i.e. acute appendicitis reappeared after the course of

and appendectomy was done. They were categorized as failure of conservative treatment (Table 4).

Table 4. Outcome of conservative treatment

Outcome	No of patients (%)
Success	79 (82.3)
Lost to follow up	6 (6.3)
Treatment Failure	
Recurrence 7 (7.3)	11 (11.4)
Converted 4 (4.1)	
Total	96 (100)

DISCUSSION

Acute appendicitis is one of the commonest surgical problems and appendectomy is one of the most commonly done operations in emergency worldwide. Despite diagnostic and therapeutic advancement in medicine, appendicitis remains a clinical emergency. In fact, this illness is one of the most common cause of acute abdominal pain. Left untreated, appendicitis has the potential for severe complications, including perforation or sepsis, and may even cause death.⁸

High diagnostic accuracy is required in patients with suspected acute appendicitis as negative appendectomy carries significant morbidity from wound sepsis, intestinal obstruction, pneumonia and infertility from fimbrial damage.⁵ There is a greater risk for abdominal adhesions after laparotomy for healthy appendices compared with that for acute appendicitis. The appendix can be a useful conduit for reconstructive surgery (e.g. hepatoporto-appendectomy or uretroplasty).⁵

Though appendectomy is an established standard treatment for acute appendicitis, it is a big burden to health system which consumes a large amount of health resources. Although true prevalence of acute appendicitis varies from country to country and race to race, it is not uncommon in our country. It is well known that appendicitis is a disease of younger age, our study also supports this view but no age is immune to appendicitis. In this series, age of patients ranges from 10 years to 60 years. The mean age of patients was 25.96 ($\pm$ 11.99) years; majority of patients 33(34.4%) belonged to 10-20 years age group followed by 32(33 %) patients in the age group between 20-30 years. Male to female ratio was 1:1 in our study population. Pain was the most important presenting symptom and was present in all the patients followed by vomiting (59.3 %), anorexia (56.2%), nausea (46.7%) and fever (21.8%). McBurney's point tenderness was present in all of 96(100%) patients in our study. The degree of tenderness was different in each individual. The presence of tenderness in our study compares well with other series where tenderness could be elicited in

absence of tenderness acute appendicitis is unlikely.¹⁰ Rebound tenderness was found in all of cases and was helpful in diagnosis. Cough sign (pain aggravated by coughing) was present in 94 (97.9%) patients in our study. Rovsing's sign was present in 70 (72.9%) patients and it is not specific for the diagnosis of acute appendicitis.

The total leukocyte count is widely used to add the diagnosis of appendicitis. The total leukocyte count alone is not diagnostic because it has low specificity. Various studies have reported that 80 to 85% patients with acute appendicitis will have a total white cell count of over 10000/cmm. Neutrophilia of more than 75% occurred in 78% patients.^{10,11} When the white cell count and neutrophils count are considered together less than 4% of patients will have normal values.¹⁰ However our study show 80.6% cases had total leukocyte count more than 10000/cmm and 65.62% cases had neutrophilia (>75%). Ultrasound was performed in total 69(71.9%) patients and it could diagnose acute appendicitis in 48(69.56%) cases.

The requirement of intravenous and oral antibiotics in our study is comparable to study done by Erikson et al⁵ and Styrd et al.⁶ The total duration of analgesics used is also comparable to study done by Erikson et al.⁵

Four (4.2%) patients needed appendectomy during the conservative treatment period. Ninety-two (95.8%) patients were successfully treated with antibiotics which is comparable to study done by Erikson et al⁵ (95%) and more than the study done by Styrd et al⁶ (86%).

Seven (7.3%) patients developed recurrent acute appendicitis during follow up period of six months in our study. It is lower than in the study done by Erikson et

al⁵ (37%) and Styrd et al⁶ (15%) during the follow up period of one year in both studies. The low recurrence in our study may be due to short period of follow up in our study. The recurrence rate was more than in a study by Kaminski et al¹² in which there was only 5% recurrence after a median follow up of 4 years.

Out of 96 patients, conservative treatment was unsuccessful in 4(4.2%) patients. It is comparable to that of the study done by Erikson et al⁵ and less than that of the study done by Styrd et al⁶. During treatment period 8 patients developed appendicular lump; out of them two patients needed appendectomy during period of follow up and six patients improved with conservative treatment. Six patients in our study group lost to follow up. There was no mortality.

Conservative treatment was successful in 79 (82.3%) patients which is comparable to that in studies done by Styrd et al⁶ and Kaminski et al.¹² Since our sample size was small and the follow up period was also short in our study, larger studies are needed to establish the superiority of conservative treatment over appendectomy in a larger population.

CONCLUSIONS

Acute appendicitis can be treated successfully with conservative (antibiotics) treatment with a short hospital stay. The outcomes are comparable to other studies done even in developed countries. Conservative treatment is the only modality to treat acute appendicitis in remote and rural regions like many parts of our country where there is no surgical facility. Though there is a risk of recurrence in some cases, complications after appendectomy can be eliminated with the conservative treatment.

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