

Original Research Article

Conservative management of early uncomplicated appendicitis in children

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ABSTRACT

Background: Right lower abdominal pain management in children is a challenging task for the surgeon. Most of the time right lower abdominal pain ends up in acute appendicitis. For long time appendicetomy was the treatment of choice. However surgical intervention has its own disadvantages such as pain, scarring, adhesions, hernia development and venous thrombosis disease. Anxiety and fear of surgery were also two difficulties in obtaining consent for surgery. Parents often request and insist for medical management. Their unwillingness for surgical intervention was the most important reason for medical management of uncomplicated acute appendicitis.

Methods: Our prospective observational study was conducted in the Department of General Surgery, R.K.D.F. Medical College and Research Centre, Bhopal, Madhya Pradesh, India during period of January 2014 to January 2016 and follow up was done till December 2016. Our target group was children under 16 years. A total of 92 children with complaint of right lower abdominal pain attended the hospital for treatment. Routine investigations including ultrasonography of abdomen were performed for all the patients. Out of 92 patients diagnosis of acute appendicitis was made in 74 patients, Surgery was performed in 32 patients, while remaining 42 patients were treated conservatively and the results were analyzed.

Results: In this study of 92 patients of pain in right iliac fossa below 16 years, 74 (80.43%) were diagnosed as acute appendicitis. 32 (43.24%) Patients were operated earlier. 42 (56.75%) Patient were treated conservatively. Out of 42 patients, 12 (16.21%) patients were operated within 1 year, 30 (40.54%) Patients didn't require any surgical intervention during 1 year follow up. In present study, significant role of antibiotic was found in conservative management of acute appendicitis in children. So it can be concluded that conservative management of acute appendicitis in children can be attempted under observation.

Conclusions: Antibiotics are both effective and safe as primary treatment for patients with uncomplicated acute appendicitis. Initial antibiotic treatment merits consideration as a primary treatment option for early uncomplicated appendicitis. Appendicectomy should be done but conservative management of acute appendicitis in children can be attempted under observation.

Keywords: Antibiotics, Appendicitis, Appendicectomy, Conservative management, Right lower abdominal pain

INTRODUCTION

Abdominal pain in school going children is one of commonest problem. Its prevalence is estimated to be 10-12%.^{1,2} In children, diagnosis is established by clinical

examination, blood investigations and ultrasonography. Acute appendicitis still stands out amongst the most widely recognized causes for acute abdominal pain in children. Present day treatment of choice for acute appendicitis is appendectomy, however complications are

inherent to operative treatment. Still appendectomy remains the standard treatment.

A few researchers have explored traditional antibiotic treatment of early appendicitis and reported great results, as antibiotic treatment is turning out to be progressively essential in the treatment of acute early appendicitis, as past studies have demonstrated that ruptured appendicitis in kids may be treated with anti-bacterial agents. Furthermore, retrospective studies in adults with perforated appendicitis who were treated conservatively have mild late recurrences rate.

Harrison et al successfully treated 42 of 47 case of acute appendicitis using antibiotic therapy.³ Coldrey et al reported 471 cases of acute Appendicitis treated conservatively with only 1 death and 9 patients requiring abscess drainage.⁴ However, morbidity and mortality rates stayed unpleasant for antibiotics treated and operated patients.

In developing countries, where medical facilities are inadequate and operative management is quite difficult due to lack of surgeon in rural area, primary antibiotic therapy for management of uncomplicated early appendicitis can be used as initial treatment in children. So, in our study we have assessed efficiency of antibiotics on acute appendicitis in young patients. The aim was to study the efficiency of antibiotics in management of early uncomplicated appendicitis in children.

METHODS

The study was conducted in Department of General Surgery at RKDF Medical College and Research Centre, Bhopal, Madhya Pradesh, India. A total of 92 patients under 16 years with pain in right lower abdomen were selected by simple random method. 74 children were diagnosed as acute appendicitis (Table 1).

Table 1: Various causes of pain in right iliac fossa.

Various causes of pain in right iliac fossa	Number	Percentage
Appendicitis	74	80.43%
Renal calculus	8	8.69%
Typhlitis/Colitis	10	10.86%
Total	92	

Inclusion criteria

Patients under 16 years with right lower abdominal pain diagnosed as acute uncomplicated appendicitis were included in the study. Patients, who refused surgery initially and were willing to participate in trial, were included in antibiotics group A). Patients willing for surgery were included in group B). Consent and refusal

for surgery and conservative treatment was obtained from parents.

Exclusion criteria

Children with co morbidities, suspected complicated acute appendicitis were excluded. Children, who were not willing for surgery in case of failure of conservative treatment, were also excluded. Patients above 16 years were excluded.

Informed written consent was obtained from all parents. Data on clinical history, clinical examination and histopathology record was considered into our study.

Group A (conservative treatment) - 42 patients were included, 28 males and 14 females (male/female ratio=2:1). These patients were admitted to hospital, were kept nil by mouth with intravenous fluids. Intravenous antibiotics were given; cefotaxime 500 mg twice daily and metronidazole 250mg 8 hourly. If symptoms did not improve within 24 hours, appendectomy was performed. In patients who improved, oral feed was resumed gradually (liquids to semisolids to solids), over 48 hrs. Intravenous antibiotics continued for two days and patients were discharged home with oral Amoxicillin 250 mg 12 hourly and metronidazole 200 mg 8 hourly for 5 days. Follow up was advised on day 10, 1 month, 6 months and one year. In patients presenting with recurrence of appendicitis, appendectomy was performed.

Group B (surgical treatment) - 32 patients were included, 20 males and 12 females (male/female ratio=1.6:1). Open appendectomy was done. Preoperative prophylactic antibiotics were given (cefotaxime 500 mg and metronidazole 250 mg intravenous) and continued post operatively for 3 days. Patients were discharged with oral Amoxicillin 250 mg 12 hourly and metronidazole 200 mg 8 hourly for 5 days. Result were analyzed.

RESULTS

In group A, 30 patients (71.42%) responded to antibiotics and were discharged after 3 days. 6 patients (14.28%), who didn't respond to antibiotics within 24 hours, were operated and appendix was found inflamed in 5 of them, including one gangrenous appendix. Remaining 6 children, who responded to antibiotics had recurrence symptoms within 10 days (1), 4 months (1), 6 months (2), 10 months (1) and 11 months (1). Surgery was done and appendix was found inflamed in all, including one gangrenous and one perforated appendix. Rate of complications was 7.14% in this group and these occurred in patients who were operated. Two patients had post-operative wound infection, and one had post-operative adhesive bowel obstruction, treated conservatively.

Treatment efficacy criteria were adequate response to antibiotics treatment, no recurrence of symptoms in one year, and absence post therapeutic complications. Treatment was effective in 64.28%, as per these criteria.

Table 2: Sex distribution.

	Group A (Antibiotic group)		Group B (Appendicectomy group)	
	Male	Female	Male	Female
Acute appendicitis	28	14	20	12

Table 3: Symptoms and sign distribution.

Presenting features	Number	Percentage
Pain right iliac fossa	74	100%
History of migratory pain	50	68%
Anorexia	43	58%
Nausea/vomiting	43	58%
Right lower quadrant abdominal guarding	46	62%
Tenderness	74	100%
Rebound tenderness	49	66%
Pyrexia $\geq 37.5^{\circ}\text{C}$	47	64%
Leucocytosis $>10 \times 10^9/\text{L}$	61	82%
Albuminuria	43	58%
Ultrasonography Confirming Appendicitis	49	66%

Table 4: Summary of outcomes outcome measure and post-operative complications.

	Group A (Antibiotic group)	Group B (Appendicectomy group)
No. of Patients	42	32
Mean age in years	13.3	13.7
Treatment efficacy	64.28%	65.62%
Mean length of stay	3	3
Recurrence	28.57% (12)	0 (0)
Post-operative complications		
No. of patients	42 (12 operated)	32
Wound infection	2	5
Residual abscess	0	1
Chest infection	0	1
Adhesive bowel obstruction	1	2
Total	3 (7.14%)	9 (28.12%)

In group B, 32 patients operated, 27 patients (84.37%) had inflamed appendix. Perforated appendix was found in 2 patients (6.25%) and gangrenous appendix in another 1 (3.12%). Rate of complications was 28.12%. 5 patients had wound infection, 1 had residual intra-abdominal

abscess, 1 suffered from chest infection and 2 admitted later on with adhesive small bowel obstruction. All complications were treated with conservative treatment. Treatment efficacy criteria were patients successfully treated with appendicectomy, inflamed appendix, no post-operative complication in one year. Treatment was effective in 65.62%, as per criteria. There was no mortality in either group.

DISCUSSION

Appendicectomy is the traditional treatment of acute appendicitis. Antibiotic treatment is considered as adjuvant to surgery in patients with suspected appendicitis. Conservative antibiotics therapy as primary treatment of uncomplicated acute appendicitis in children, versus appendicectomy, was studied. In our study 71.42% patients responded to antibiotics therapy and were safely discharged from hospital after 72 hours. The success rate of conservative treatment reported in review of literature was 86-95%.⁵⁻⁸

We observed 28.57% recurrence of appendicitis in conservatively treated children, in one year. Recurrence rate of 5-37% has been reported in literature.⁵⁻⁹ Rate of complications was 11.9% and 28.13% respectively in group A and B. In group A, no patient had any complication during conservative therapy, and all complication occurred after appendicectomy. In literature review, complications up to 8% have been found in antibiotics group and 14-17% in surgery group.^{6,7,11,12}

Hansoon J et al found minor complications similar in both groups, while major complications, threefold higher in patients who underwent appendicectomy.¹³ Turhan AN et al found similar morbidity rates in both groups. There was no mortality in our study.¹⁴

In literature review, we didn't find any mortality in randomized controlled trials, comparing antibiotics treatment with appendicectomy, but overall mortality after appendicectomy was found 0.8/1,000 in non-perforated appendicitis, and 5.1/1000 in perforated appendicitis.¹⁵

In our study, diagnostic accuracy in surgery group was 84.37%, while in literature it ranges from 85-97%. In literature the cost was significantly less in patients managed conservatively with antibiotics alone, and these patients experienced less pain requiring less analgesia. However the cost was not calculated in our study.^{5,6,9,16}

Treatment efficacy in group A, was 64.28%, and in group B was 65.62%. We also observed no major difference in the duration of stay in both groups. We used third generation cephalosporins and metronidazole in all our patients, treated conservatively. This is same as used in most randomized control trials. Vons C et al found similar results with amoxicillin plus clavulanic acid.¹⁷

CONCLUSION

Conservative management of early uncomplicated acute appendicitis with antibiotics treatment is a safe option in children whose parents refuse surgery. Prospective randomized trials are needed to conclusively define the role of antibiotic treatment versus appendectomy in the management of uncomplicated acute appendicitis in children

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