

A STUDY ON OUTCOME OF CONSERVATIVELY MANAGED APPENDICITIS

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ABSTRACT

BACKGROUND

Appendicitis is the most common acute abdominal condition requiring a surgical intervention, worldwide. Conservative management of uncomplicated appendicitis and the need for an interval appendicectomy are still an area of debate. This study aims to find the recurrence rate of appendicitis in conservatively managed patients and to analyse its related factors.

MATERIALS AND METHODS

This is a prospective study done on general surgical patients from February 2014 to July 2015 in a tertiary level teaching hospital. Patients with appendicitis who were conservatively managed were followed up for a period of 1 year and their initial presentation and recurrence of disease were studied.

RESULTS

Out of 184 patients studied, 67 developed recurrence (36.4%). Ultrasound scan finding of an increased appendicular diameter (>or = 7 mm) was found to be a significant predictive factor.

CONCLUSION

Conservative management of uncomplicated appendicitis is a valid option and an interval appendicectomy is not mandatory in all such patients. High recurrence rate among those who had a USG finding of dilated appendix suggests that it may be considered as an indication for suggesting interval appendicectomy

KEYWORDS

Appendicitis, Conservative Management, Recurrence, Interval Appendicectomy.

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BACKGROUND

Acute appendicitis is the most common cause of acute surgical abdomen leading to an emergency laparotomy, worldwide. A life table model study showed that the lifetime risk of developing appendicitis is 8.6% in males and 6.7% in females.¹

About 60% of acute appendicitis is related to hyperplasia of submucosal lymphoid cells,² 35% due to intraluminal obstruction by faecolith or faecal stasis,³ 4% due to other agents causing obstruction and 1% due to rarer causes like adhesions, malignancy etc.

Emergency appendicectomy has been the gold standard in the treatment of acute appendicitis due to the risk of pathological progression, if untreated.⁴ But there are many surgeons thinking that surgery may not be necessary for all the patients with uncomplicated appendicitis, as the disease may resolve spontaneously or with antibiotics.⁵

In some still poorly characterised patients, the risk-benefit balance of antibiotic therapy is probably better than that of emergency appendicectomy. Also, when informed of the risks, some patients are willing to choose antibiotic therapy.⁶

There are another group of patients, referred to a tertiary care centre after partial treatment with antibiotics and analgesics and hence partially or completely relieved of their symptoms. Conservative management is practiced in the above mentioned groups of patients also.

They are kept under observation; managed with antibiotics and analgesics and later discharged. But there remains a chance that some of them may present with recurrent appendicitis.⁷ After complete resolution of an acute episode, if the patient again presents with another similar episode, it is termed as recurrent appendicitis. Considering this, some surgical centres offer interval appendicectomy for conservatively managed patients. These two categories may undergo appendicectomy on a second sitting, but there is another large group of patients whose acute episode is managed conservatively but had no recurrence of symptoms or not operated on an elective basis. There arises the question about the need of emergency appendicectomy or interval appendicectomy, in a case of uncomplicated appendicitis. Even though the non-operative management of uncomplicated diverticulitis, cholecystitis, salpingitis, and neonatal enterocolitis is now established, conservative

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management of appendicitis still remains controversial. Hence a follow up study of the above mentioned groups of conservatively managed appendicitis patients was carried out to assess the rate of recurrence of appendicitis and the influence of associated factors on it.

MATERIALS AND METHODS

This is a prospective cohort study conducted for a period of 18 months, from February 2014 to July 2015 at Government Medical College Thrissur, Kerala, South India. Cases included in the study were selected from patients admitted with a diagnosis of acute uncomplicated appendicitis who were managed conservatively. Patients who developed any sort of complications like abscess, mass formation or perforation during the treatment period, and those planned for interval elective appendectomy were excluded from the follow up study. Patients with identified confounding co-morbidities like pelvic inflammatory disease and urolithiasis were also excluded. After discharging from the hospital, they were followed up for a period of 1 year.

In the initial survey of patients, careful history was taken about symptoms of appendicitis and a thorough physical examination was done, with analysis of diagnostic investigations like blood counts, urine routine and ultrasonography of abdomen. Alvarado score of patients were charted. Treatment modalities followed for conservative management were enlisted.

Follow up study of these patients was done and those who developed recurrence were analysed for parameters like symptoms, time of recurrence, place and mode of treatment and complications during recurrence.

Data collected were entered in windows excel worksheet and analysed using appropriate statistical methods using Epi Info software. Appropriate statistical tests were used for assessing statistical significance.

RESULTS

Variable	Category (Years)	Frequency No. (%)	Recurrence Rate
Age Group	11- 20	72 (39.13)	34 (47.22%)
	21- 30	43 (23.37)	9 (20.93%)
	31- 40	36 (19.57)	12 (33.33%)
	41- 50	13 (7.07)	4 (30.77%)
	51-60	8 (4.35)	3 (37.5%)
	61- 70	8 (4.35)	5 (62.5%)
	71- 80	4 (2.17)	0 (0.00%)
	Total	184 (100)	67 (36.40%)
Gender	Male	109 (59.24)	40 (36.70%)
	Female	75 (40.76)	27 (36.00%)

Table 1. Age and Gender wise Distribution of Recurrence Rate

Total of 184 patients were followed up for a period of 1 year. Of these, 109 were males and majority were youngsters, with a mean age of 25 years (Table 1).

Recurrence rate of appendicitis was found to be 67 out of 184 patients (36.41 %). This showed that a significant majority of conservatively managed patients (63.59%) were symptom free at the end of one year. (Figure 1). Out of 184 patients, only 25 patients (13.59 %) needed emergency appendectomy during follow-up period.

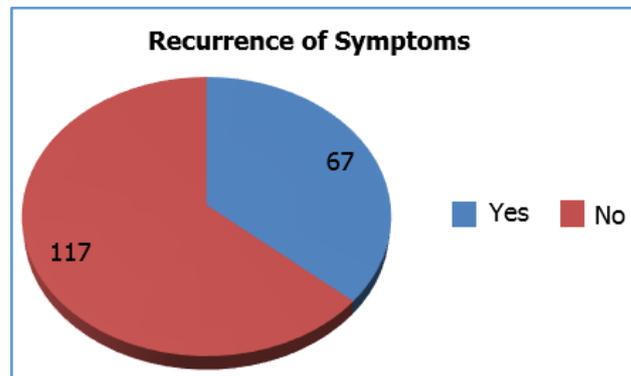


Figure 1. Recurrence of Symptoms

32 of 67 (47.7%) patients who had recurrence developed symptoms during the initial 6 weeks after discharge. 25 patients (37.31%) developed symptoms of recurrence within 6 months and 10 patients (14.92%) within 1 year. Out of 25 patients who underwent surgery, 10 (40%) were done within 6 weeks, 11 (44%) within 6 months and 4 (16%) within 1 year, showing that significant majority of recurrence occurred during the early weeks after discharge. (Figure 2)

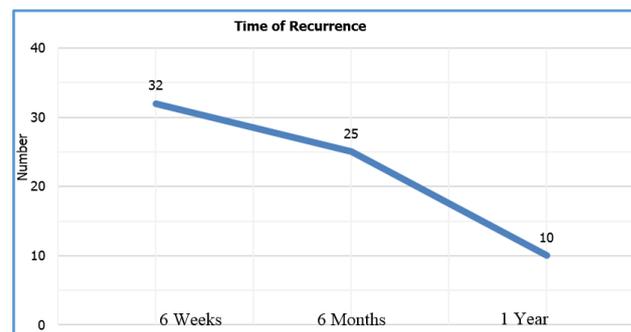


Figure 2. Time of Recurrence

There was no statistically significant association between leucocytosis and Alvarado scoring during initial illness and recurrence of disease. (Table 2) Duration of antibiotic therapy and type of antibiotics used were also not found to influence the rate of recurrence of appendicitis. (Table 2)

Variable	Category	Number	Recurrence of Appendicitis		x ² Value	p- Value
			Yes (%)	No (%)		
Leucocytosis	Yes	64	20 (31.25)	44 (68.75)	1.129	0.288
	No	120	47 (39.17)	73 (60.83)		
Alvarado Score	5	56	33 (58.93)	23 (41.07)	2.333	0.126
	6	60	42 (70)	18 (30)		
	7	68	42 (61.76)	26 (38.24)		
Type of antibiotic used	CX+ MTZ	36	9 (25)	27 (75)	2.518	0.112
	3 rd G Ceph + MTZ	148	58(39.19)	90 (60.81)		

Table 2. Association of Leucocytosis, Alvarado Score and Type of Antibiotics with Recurrence

CX= Ciprofloxacin, MTZ= Metronidazole, Ceph = Cephalosporins.

However, significant association was observed between the ultrasound finding of an increased appendicular diameter (dilated/oedematous appendix) of greater than or equal to 7 mm and recurrence (Table 3).

Diameter of Appendix >7 mm	Number	Recurrence of Appendicitis		x ² Value	p- Value
		Yes (%)	No (%)		
Yes	116	49 (42.24%)	67 (57.76%)	4.605	0.031
No	68	18 (26.47%)	50 (73.53%)		
RR (95%CI) = 1.596 (1.018- 2.502)					

Table 3. Association of Appendicular Diameter with Recurrence

DISCUSSION

This was a prospective study done on general surgical patients in a rural tertiary care teaching hospital in Kerala, South India. Incidence of recurrence of appendicitis in patients with conservatively managed uncomplicated appendicitis within a period of one year was 36.41%. This data is comparable with that of studies conducted in western population. Data from a meta-analysis involving four randomised trials of antibiotics versus immediate appendectomy in 900 patients admitted with uncomplicated appendicitis showed that 63% of patients treated with antibiotics were asymptomatic and had no complications or recurrences after follow up for 1 year. Another meta-analysis in 2007 that collected the results of 44 prospective studies showed that antibiotics were efficacious in 92.8% of cases of appendicitis, even complicated by local peritonitis. The efficacy of antibiotic treatment ranged from 86 to 100% and the recurrence rate from 10.4 to 35%.⁸

A number of recent studies suggest that the pathology of appendiceal inflammation can follow a more remitting course with evidence showing spontaneous resolution.⁹

Hyperplasia of the appendiceal lymphoid follicle frequently causes luminal obstruction. Antibiotic therapy probably causes regression of lymphoid hyperplasia because of suppression of bacterial infection and prevents ischemia and bacterial invasion in the early stage of appendicitis.¹⁰ If intravenous antibiotics are administered for less than 5 days, oral antibiotics should be administered for a total period of 7 days.¹¹ In adults, the common antibiotics used are amoxicillin + clavulanic acid, cephalosporins or fluoroquinolones. Metronidazole or Tinidazole is often added.

Studies were conducted in India also to determine the role of antibiotics in the non-operative treatment of acute appendicitis. Conclusion was that antibiotic treatment in patients with acute appendicitis is quite effective and these patients may not need surgery. The patients managed

conservatively with antibiotics alone experienced less pain and required less analgesia but had significant recurrence rate.¹²

In our study, the only parameter during the initial episode of appendicitis which showed a significant relation with recurrence of disease was the increased appendicular diameter detected in ultrasonography. Normally the diameter of a non-inflamed appendix is less than 6 mm in majority of adults (mean 5.2 mm).¹³ Diameter >7 mm is suggestive of appendicitis by studies in western population.¹⁴ This finding indicates that patients with dilated appendix during initial episode of illness has got a higher chance of developing recurrence of appendicitis for whom interval appendicectomy may be advised.

However, there is a risk of complications occurring in cases of conservatively managed acute appendicitis, and this risk should be compared with the risk of complications after emergency appendectomy.¹⁵

Limitations of the Study- Our study has the limitations of a relatively small sample size and short duration of follow up even though it showed correlations with similar studies done elsewhere in the world. Further studies are needed including larger cohort and longer follow up.

The diagnosis of acute appendicitis in the study group could not be commented as 100% accurate, as histopathology reports or CT images were not available in all cases. Yet the diagnostic accuracy was maintained with clinical examination and investigations including USG.

CONCLUSION

In the follow-up study of conservatively managed appendicitis patients, a significant majority of them were asymptomatic at the end of 1 year, showing that an option of interval appendicectomy is not mandatory in all such patients. High recurrence rate among those who had a USG finding of dilated appendix suggests that it can be

considered as an indication for suggesting interval appendectomy.

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