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Research Article

CONSERVATIVE MANAGEMENT OF ACUTE APPENDICITIS IN BHUJ, KUTCH: A PROSPECTIVE STUDY

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ABSTRACT

Objective: The current research was performed to know the outcome of conservative treatment in acute appendicitis using antibiotic therapy.

Methods: The present and prospective research performed at Department of Surgery, Gujarat Adani Institute of Medical Science, Bhuj, Kutch for a duration of 2 years. All subjects diagnosed as acute appendicitis radiologically were enrolled into the research considering inclusion and exclusion criteria. Modified Alvarado score (MAS) was calculated based on clinical symptoms, signs, and laboratory investigations. Injection ceftriaxone and injection metronidazole were given for 48–72 h. Subjects who responded for i.v. antibiotics were switched to tablet ciprofloxacin and tablet metronidazole for 7 days and followed for 6 months. Subjects who did not respond to conservative treatment or had recurrence were classified as treatment failure/recurrence.

Results: In the present research, total of 300 subjects were incorporated that comprise of 140 males and 160 females. Tenderness in the right inguinal fossa was observed in all the Subjects. MAS were in between 4 and 6 in 84 subjects and were 7–9 in 216 subjects with an average of 7.30. Thirty-six subjects had complicated acute appendicitis and 264 had uncomplicated acute appendicitis.

Conclusion: In general, achievement rate of conservative management according to the present research was 82%. On the other hand, there were 12% failures and 6% recurrences in the current research. One of the major future goals will be to recover diagnosis of appendicitis, particularly the diagnostic capability to distinguish among the various forms of appendicitis.

Keywords: Acute appendicitis, Antibiotic therapy, Conservative treatment, Modified Alvarado score.

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INTRODUCTION

The acute appendicitis has been considered by surgeons a progressive disease leading to perforation for more than 100 years. In the last decade, the theories challenging of this concept gained notice particularly in adults. Although being one of the most common abdominal emergencies with a existence risk of about 8%, the pathogenesis of appendicitis is still not fully unwritten. It is thought to be multifactorial, with mechanical, infectious, and genetic situation leading to inflammation of the appendix [1]. Appendicitis can present as simple or uncomplicated, with inflammation of the appendix with or without phlegmonous imbibitions of its surroundings, or as complicated appendicitis, with inflammation having led to gangrene or perforation, with or without building of an abscess.

Conventionally and for decade, appendectomy is the management of option for appendicitis. Similar conditions such as colitis and diverticulitis are managed conservatively with good results. Appendectomy frequently perceived as minor surgery by common people, sometimes have severe complications and infrequently death. As layman believes appendectomy as easy surgery, it is hard for them to accept complication. Hence, when conservative treatment fails, subjects are more accessible for surgery and complications also. Post-appendectomy recurrent pain in abdomen, obstruction, adhesion, and wound complication can occur.

The non-operative conservative management of uncomplicated acute diverticulitis and salpingitis has been well recognized but the non-operative management (NOM) of acute appendicitis is up till now to be explored. Modern researches demonstrated majority of subjects with acute, uncomplicated appendicitis can be managed securely with an antibiotics-first strategy [2]. Antibiotics which are more efficient are utilized in the management of acute appendicitis. Antibiotic therapy is not a complete alternate for surgery in the management of acute appendicitis. In this observation, the present research was performed to know the outcome of conservative treatment in acute appendicitis using antibiotic therapy.

METHODS

The current prospective research performed at Department of Surgery, Gujarat Adani Institute of Medical Science, Bhuj, Kutch for a period of 2 years. Ethical approval was taken from the institutional ethical committee and written informed consent was taken from all the participants.

Inclusion criteria

Radiologically diagnosed acute appendicitis cases with age >10 years attending within 2 days of symptom onset with Modified Alvarado score (MAS) more than or equal to 4 were included in the study.

Exclusion criteria

The following criteria were excluded from the study:

- Recurrent cases of appendicitis
- Subjects with HIV
- Subjects on immunosuppressive therapy
- Pregnant women
- Appendicitis with complications
- Subjects who were allergic to antibiotics in the study protocol.

All the subjects attending emergency department with pain in the lower abdomen were evaluated clinically for signs of acute appendicitis. Ultrasound examination was performed to diagnose acute appendicitis and to exclude other differential diagnosis and complications of acute appendicitis. All the subjects who were diagnosed as acute appendicitis radiologically without any other complications were registered into the

research considering the inclusion and exclusion criteria. The subjects were counseled for conservative treatment of acute appendicitis, explaining all the pros and cons of the management. The subjects who were keen to undergo conservative management were incorporated in this research. All the demographic date such as age, sex, occupation, contact details, and address were recorded from the Subject. Detailed history was taken and abdomen was examined systematically and signs of acute appendicitis were recorded. The ultrasound findings were documented. MAS was calculated and documented.

Subjects were recommended nil by mouth for 24 h and administered intravenous antibiotics ceftriaxone every 12 h and metronidazole every 8 h with dose depending on age of the subject for 48–72 h. Paracetamol infusion was given every 8 h to relieve the pain of the subjects.

The clinical evaluation was performed every 12 h. Subjects who responded for i.v. antibiotics were switched over to oral antibiotics-tablet ciprofloxacin 500 mg with tablet metronidazole 400 mg thrice a day for a total of 7 days. In those subjects, whose clinical condition were worsening or not improving, open or laparoscopic appendectomy was performed. The subjects were followed at 10 days and every month for a period of 6 months. The disease recurrence would be managed either conservatively or surgically depending on the clinical presentation and on subject preference. After completion of treatment and follow-up for 6 months period, the subjects were grouped into successful/failure of conservative treatment. Failure of conservative treatment again divided into treatment failure and recurrence. Treatment failure was clinical worsening or lack of clinical development in admitted subjects treated conservatively.

Statistical analysis

The recorded data were compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of Statistical Package for the Social Sciences (SPSS) version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5%, respectively.

RESULTS

In the present research, total of 300 subjects were incorporated. The minimum and maximum age in the present research was 20 and 80 years. The mean age in this study was 36.70. One hundred and forty males and 160 females were included in this research. Two hundred and forty-nine subjects had migratory abdominal pain in the present research. Anorexia was seen in 270 subjects and absent in 30 subjects. Two hundred and sixty-four subjects had nausea and vomiting. Tenderness in the right inguinal fossa was seen in all the Subjects. Rebound tenderness was seen in 105 subjects and absent in 195 subjects. Two hundred and eighty-five subjects in this study had leukocytosis and 135 subjects had fever (Table 1).

Computed tomography scan was performed in 30 cases and ultrasound was performed in 270 cases for diagnosis of acute appendicitis. MAS were in between 4 and 6 in 84 subjects and were 7–9 in 216 subjects with an average of 7.30. Thirty-six subjects had complicated acute appendicitis and 264 had uncomplicated acute appendicitis. In 36 cases with complicated acute appendicitis, 18 cases had appendicular mass, 12 cases had perforation, and six cases had appendicular abscess. Conservative treatment failed in 36 cases in this study (Table 2). In those 36 cases, 18 cases who had appendicular mass was treated with i.v. antibiotics for 5 days, 12 cases who had perforation was operated and in six cases who had abscess, extraperitoneal drainage was performed. Two hundred and sixty-four cases were followed for a period of 6 months and 18 cases recurred over a period of 6 months (Table 3). In 18 recurrent cases, all cases were performed appendectomy.

Table 1: Distribution of clinicopathological factors in the current research

Clinicopathological factors	Number	Percentage
Migratory abdominal pain	249	83
Anorexia	270	90
Nausea and vomiting	264	88
Tenderness	300	100
Rebound tenderness	105	35
Fever	135	45
Leukocytosis	285	95

Table 2: Outcome of conservative treatment in the current research

Conservative treatment outcome	Number	Percentage
Successful	246	82
Failure	36	12
Recurrence	18	6

Table 3: Outcome of conservative treatment with different MAS

Conservative treatment	Number	Percentage
	4–6	7–9
Successful	84	180
Failure	0	36
Total	84	216

DISCUSSION

In the general surgical practice, acute appendicitis is the most common cause of acute abdominal pain. In 1889, McBurney reported that appendectomy was the mainstay of management for acute appendicitis. Worldwide the standard of care for appendicitis is appendectomy and considered easy and usual surgery [3]. However, the mortality rate of operation ranges from 0.07 to 0.7 and from 0.5 to 2.4% in subjects without and with perforation correspondingly.

There is no doubt that appendectomy is the most competent way of treating appendicitis, with success rates of >95% as well as low overall morbidity and mortality [4]. On the other hand, it is a way more enveloping treatment than a course of antibiotics. When comparing antibiotic therapy with surgery, we should be conscious that we are comparing two treatment strategies of dissimilar nature and not two dissimilar surgical techniques. Consequently, we should take a broader look and not focus on success rates only. To experience surgery, although considered low-risk, it is no small feat and represents a weight for many subjects. Many subjects would consider "surgery" a difficulty by itself [5]. Hence, many subjects would surely favor a non-operative approach. For subjects with a history of prior surgical or anesthesiology complications, antibiotic therapy bears potentially great advantages, although those subjects have been excluded from all of the trials. Performing surgery also necessitate massive personnel and technical resources. Since frequency of appendicitis is high, even a moderate reduction of the surgery rate might lead to appreciably less operations required.

In the present research, the mean age of presentation was 36.70±10.20. According to Gedam *et al*., the mean age in their study was 30.45±9.71 years [6]. The majority of subjects were seen in the age group of 21–30 years which was constant with the research of Jade *et al.* and Lohar *et al*. [7,8]. There was female majority in the present research which was compared to a research by Gedam *et al*., which was 1:1.09 [6]. In the present research, abdominal pain was seen in 84% of subjects which was different to the research conducted by Ekka *et al*., which was seen in 100% of subjects [9]. Anorexia was observed in 90% of subjects in the present research, whereas anorexia was seen in 61% of subjects in a research by Berry *et al*. [10] 87% of subjects had nausea/vomiting in this current research, which was similar to a study by Punjala *et al* [11]. About 45% of subjects had fever in this study,

but Reddy *et al*. reported fever in 76% of subjects in their study [12]. Tenderness in right inguinal fossa was seen in all 100% of subjects and rebound tenderness was observed in 105 subjects. An Eastern Indian study reported tenderness in the right inguinal fossa in 89.6% and rebound tenderness in 72.8% of subjects [9]. Ultrasound was done in 90% of cases in the present research. A normal appendix on ultrasound is seen as small, ovoid, easily compressible, concentrically layered, mobile, blindly ending, and a peristaltic elongated tubular structure which arise from caecum from its posteromedial aspect [13,14]. The appendicular lumen is collapsed with a central echogenic submucosa bounded by hypoechoic muscularis mucosa. Usually, the appendicular lumen contains gas, the absence of gas suggests inflamed appendix [15,16]. The sonographic features of acute appendicitis comprise non-compressible, aperistaltic, blindly-ended, and elongated tubular structure arising from base of caecum at ileocaecal junction; bull's-eye emergence of appendix; appendix diameter greater than 6 mm; appendicolith; distended lumen with anechoic and hypoechoic material; circumferential loss of submucosal layer of appendix; and loculated and prominent pericecal fluid and fat.

In the present research, 28% of subjects had MAS in between 4 and 6 and 72% had in between 7 and 9. The conservative management was successful in all the subjects with MAS of 4–6. According to the results of the current research, majority of subjects recovered in 72 h, so at least 72 h should be awaited to perceive the answer for conservative management. The conservative treatment failed in 12% of subjects with MAS between 7 and 9 and successful in 60% of subjects. About 12% had complicated appendicitis in this research which demonstrates appendicular mass in 6% cases, perforation in 4%, and abscess in 2%. In the present research, conservative treatment failed in 12% of subjects. In a study done by Alnaser *et al*., 11.1% of subjects had failure of conservative treatment which was alike to current research [17]. In a research performed by Gedam *et al*., the success rate was 74.65%, and failure rate was 14.08% which was comparable to the present research [6]. A real disadvantage of data on NOM is the lack of confirmation in some of the subjects that might help the most from evading of operation: Older subjects, those with medical comorbidities, and immunocompromised subjects, as all of them have been excluded from trials. Additional concerns occur since in those subjects, diagnosis is often tricky since arrangement is often atypical; therefore, clinical assessment of antibiotic therapy might be even more not easy. Thus, we can only conjecture if the abovementioned factors outweigh the risk reduction stemming from an escaping of operation.

The success of conservative therapy will ultimately depend on the experience gained in further trials as well as in daily practice, especially concerning recurrence rates and nature of recurrence episodes over the years. We can envisage appendicitis to be understood as a extensively more complex disease than it has been apparent in the past.

CONCLUSION

The overall success rate of conservative management according to the current research was 82%. On the other hand, there were 12% failures and 6% recurrences in the current research. One of the chief future goals will be to recover diagnosis of appendicitis, particularly the diagnostic capability to distinguish among the various forms of appendicitis. Efforts should be made to try to decrease radiation exposure by improving and spreading ultrasound capability, therefore resolutely establishing ultrasound as the first line imaging modality in acute abdominal disease. Uncomplicated acute appendicitis can be managed by conservative management provided, they were firmly followed every month for at least 6 months period to detect recurrences.

AUTHORS' CONTRIBUTIONS

Dr Ashokkumar G. Jiladia and Dr Hardik Maheshbhai Patel: Concept and design of the study, prepared first draft of manuscript; interpreted the results; reviewed the literature, and manuscript preparation. Dr Het Yogesh Soni and Dr Chintan Nayak: Concept, Coordination, Preparation of Manuscript, Statistical analysis and Interpretation, Preparation of Manuscript, and Statistical Analysis and Interpretation.

CONFLICTS OF INTEREST

None.

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