

ORIGINAL RESEARCH

Comparative evaluation of efficacy of Antibiotic Therapy versus Appendectomy for Treating patients with Uncomplicated Acute Appendicitis

¹Dr. Mayank Chugh, ²Dr. Dhaval Jayantilal Panchal, ³Dr. Maheshbhai Raghavbhai Kakadiya

¹Associate Professor, Department of Medicine, Mayo Institute of Medical Sciences, Barabanki, UP, India

²Assistant Professor, Department of Surgery, Mayo Institute of Medical Sciences, Barabanki, UP, India

³Assistant Professor, Department of Pathology, Pacific Medical College and Hospital, Udaipur, Rajasthan, India

Corresponding Author

Dr. Maheshbhai Raghavbhai Kakadiya

Assistant Professor, Department of Pathology, Pacific Medical College and Hospital, Udaipur, Rajasthan, India

Received: 19 June, 2022

Accepted: 25 July, 2022

ABSTRACT

Aim: This study aims to evaluate the role of antibiotics in the management of acute appendicitis and to assess whether appendectomy retains its status as the gold standard of care. **Materials & Methods:** A total of 40 patients within the age range of 18 to 60 years were enrolled. Only those patients were included which had a clinical suspicion of uncomplicated acute appendicitis. CT of the abdomen The prophylactic antibiotics were given around half an hour before to the incision. During their hospital stay, patient outcomes were evaluated, and a visual analog scale (VAS) was used to measure pain. Resolution of acute appendicitis, which led to hospital release without the need for surgery and no recurrence, was the main outcome goal for patients in the antibiotic group. **Results:** Mean age of the patients of the surgical group and antibiotic group was 38.3 years and 37.1 years respectively. Overall complications rate and incidence of surgical site infection was higher in surgical group in comparison to antibiotic group. Also mean VAS at follow-up was higher in surgical group. **Conclusion:** For patients with uncomplicated appendicitis, antibiotics are a safer option.

Key Words: Appendectomy, Appendicitis, Antibiotics

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Acute appendicitis is inflammation of the vermiform appendix and remains the most common cause of the acute abdomen in young adults. The mainstay of treatment in most centre is an appendectomy, and, consequently, this is one of the most common operations performed on the acute abdomen¹. However, appendicitis can be notoriously difficult to diagnose, and there exists a negative appendectomy rate of 10%–20% despite the use of preoperative computed tomography (CT)^{2,3}. In addition, as with all operations, postoperative complications exist, including wound infections, intra-abdominal abscesses, ileus and, in the longer term, adhesions. With this in mind, it is worth considering that the mainstay of treatment for other intra-abdominal inflammatory processes, such as diverticulitis, consists initially of conservative management with antibiotics. Traditionally, appendectomy has been the treatment of choice for acute appendicitis. However, in view of the potential morbidity associated with an

open appendectomy, is there a role for conservative management with antibiotics? A number of reports exist regarding possible conservative management of appendicitis, with or without interval appendectomy, and many pediatric centers practice this approach in patients with advanced appendicitis^{4,5}.

Consequently, the aim of this review was to evaluate the current literature on the role of antibiotics versus appendectomy in the management of acute appendicitis and to assess if appendectomy remains the gold standard of care.

MATERIALS & METHODS

The present study compared the antibiotic therapy with emergency appendectomy in the treatment of uncomplicated acute appendicitis confirmed by a computed tomographic (CT) scan. A total of 40 patients within the age range of 18 to 60 years were enrolled. Only those patients were included which had a clinical suspicion of uncomplicated acute appendicitis. CT of the abdomen When the

appendiceal diameter was more than 6 mm with wall thickening and at least one of the following conditions was present—abnormal contrast enhancement of the appendiceal wall, inflammatory edema, or fluid collections surrounding the appendix—acute appendicitis was deemed to be present. All the patients were randomly and broadly divided into two study groups as follows: open appendectomy or to receive antibiotic therapy with intravenous ertapenem. The procedure was an open appendectomy. The prophylactic antibiotics were given around half an hour before to the incision. If the appendiceal muscularis layer showed histological evidence of transmural neutrophil infiltration, appendicitis was considered proven. Patients in the antibiotic group received intravenous ertapenem sodium (1 g/d) for three days; the initial dosage was given in the emergency room. Within 12 to 24 hours after admission, the clinical state of the patients in the antibiotic group was reassessed. During their hospital

stay, patient outcomes were evaluated, and a visual analog scale (VAS) was used to measure pain. Resolution of acute appendicitis, which led to hospital release without the need for surgery and no recurrence, was the main outcome goal for patients in the antibiotic group. All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS softer are.

RESULTS

Mean age of the patients of the surgical group and antibiotic group was 38.3 years and 37.1 years respectively. Majority proportion of patients of both the study group were males. baseline VAS among the patients of surgical group and control group was 6.3 and 6.1 respectively. Overall complications rate and incidence of surgical site infection was higher in surgical group in comparison to antibiotic group. Also mean VAS at follow-up was higher in surgical group.

Table 1: Baseline data

Variable		Surgical group	Antibiotic group
Mean age (years)		38.3	37.1
Gender	Males	12	13
	Females	8	7
Baseline VAS		6.3	6.1
HB (mg/dL)		13.5	13.2

Table 2: Outcome

Variable		Surgical group	Antibiotic group	p-value
Overall complications (%)		25	5	0.001 (Significant)
Surgical site infection	Organ space	2	0	0.000 (Significant)
	Deep incisional	2	0	
	Superficial	3	1	
Hospital stay (days)		3.3	3.5	0.128
VAS at discharge		3.5	2.1	0.002 (Significant)
VAS at one week		2.9	1.1	0.000 (Significant)

DISCUSSION

Acute appendicitis continues to pose diagnostic challenges, prompting many surgeons to incorporate imaging studies alongside clinical assessments before opting for surgical intervention. However, the use of imaging, notably computed tomography (CT) scanning, raises concerns about radiation exposure, particularly in younger patients. Moreover, appendectomy carries substantial morbidity and mortality risks. Therefore, it is imperative to assess whether appendectomy still holds the status of the gold standard treatment for acute appendicitis⁶. Recently, several authors have suggested the conservative management of acute appendicitis with antibiotics^{7,8}. While some propose interval appendectomy due to concerns about recurrent appendicitis and the potential for missed carcinoma, there is a growing inclination towards antibiotic treatment alone, bypassing surgery entirely^{9,10}. In such cases, patients may undergo future radiologic or

endoscopic evaluations to rule out any missed neoplastic lesions. This evolving debate prompts reflection, particularly considering that other intra-abdominal inflammatory conditions are managed conservatively. It highlights that the current approach to acute appendicitis management may be more rooted in tradition than evidence-based practice.

Mean age of the patients of the surgical group and antibiotic group was 38.3 years and 37.1 years respectively. Majority proportion of patients of both the study group were males. baseline VAS among the patients of surgical group and control group was 6.3 and 6.1 respectively. Overall complications rate and incidence of surgical site infection was higher in surgical group in comparison to antibiotic group. Also mean VAS at follow-up was higher in surgical group. The utilization of antibiotics in appendicitis treatment is a multifaceted process influenced by various factors such as age (children vs. adults), the nature of the appendicitis (uncomplicated vs. complicated), timing

of treatment (interval to appendectomy vs. immediate), and alternative interventions like percutaneous drainage. Recent studies by St. Peter et al.¹¹ and Marin et al.¹² have shed light on the management of complicated appendicitis in children, showcasing comparable outcomes between interval appendectomy with initial percutaneous drainage and immediate surgery. Additionally, Marin et al. demonstrated the safety and efficacy of percutaneous drainage in treating complicated appendicitis with abscess formation, thereby expanding the spectrum of viable treatment options. Given the potential for long-term complications such as bowel obstruction associated with appendectomy^{13,14,15}, the consideration of antibiotics as a treatment strategy seems prudent in this evolving discourse.

Alajaimi J et al compared the options of surgery and antibiotics only in terms of efficacy, complications, and financial cost. A range of databases and search strategies were adopted, and various databases were used, including PubMed, ScienceDirect, Google Scholar, and JAMA. Collectively, 30 studies were reviewed, but only 18 were included. Efficacy rates were higher in the appendectomy group. Nevertheless, the antibiotics-only group maintained an efficacy rate greater than 70% at one-year follow-up. Risk factors that decreased the efficacy in medical management included the presence of appendicolith, neoplasm, appendiceal dilatation, peri-appendiceal fluid collection, higher mean temperature, CRP, and bilirubin. Complications were more frequent and significant in the surgery group. These included complications related to anaesthesia, surgical site infections, damage to nearby structures, and pulmonary embolism. Despite several years of follow-up and disease recurrences, higher financial costs were observed in surgically treated patients compared to the antibiotics-only group. Given the high success rates post-appendectomy for acute appendicitis over the decades, the efficacy of conservatively treated acute appendicitis raises a strong argument when choosing one of the two options. The efficacy remained consistently higher across the literature in the surgery group than in the antibiotics-only group. However, it is still arguable that antibiotics may be a preferable option given an efficacy rate of more than 70% at one year and overall higher complications associated with surgery. The argument of missing a neoplasm by avoiding surgery is valid. Antibiotics-only therapy for uncomplicated appendicitis is cost-effective with fewer complications than surgery. However, appendectomies have higher efficacy. Thus, surgical treatment prevails as the standard of care.¹⁶

CONCLUSION

For patients with uncomplicated appendicitis, antibiotics are a safer option.

REFERENCES

- O'Connell PR. The vermiform appendix. In: Williams NS, Bulstrode CJK, O'Connell PR, editors. *Bailey and Love's short practice of surgery*. 25th ed. London (UK): Hodder Arnold; 2008. pp. 1204–18.
- Rao PM, Rhea JT, Rattner DW, et al. Introduction of appendiceal CT: impact on negative appendectomy and appendiceal perforation rates. *Ann Surg*. 1999;229:344–9.
- Soreide K. Should antibiotic treatment replace appendectomy for acute appendicitis? *Nat Clin Pract Gastroenterol Hepatol*. 2007;4:584–5.
- Mason RJ. Surgery for appendicitis: Is it necessary? *Surg Infect (Larchmt)* 2008;9:481–8.
- Gillick J, Mohanan N, Das L, et al. Laparoscopic appendectomy after conservative management of appendix mass. *Pediatr Surg Int*. 2008;24:299–301.
- Gillick J, Velayudham M, Puri P. Conservative management of appendix mass in children. *Br J Surg*. 2001;88:1539–42.
- Stahlfeld K, Hower J, Homitsky S, et al. Is acute appendicitis a surgical emergency? *Am Surg*. 2007;73:626–9.
- Hansson J, Korner U, Khorram-Manesh A, et al. Randomised clinical trial of antibiotic therapy versus appendectomy as primary treatment of acute appendicitis in unselected patients. *Br J Surg*. 2009;96:473–81.
- Styrud J, Eriksson S, Nilsson I, et al. Appendectomy versus antibiotic treatment in acute appendicitis: a prospective multi-center randomised controlled trial. *World J Surg*. 2006;30:1033–7.
- Gillick J, Mohanan N, Das L, et al. Laparoscopic appendectomy after conservative management of appendix mass. *Pediatr Surg Int*. 2008;24:299–301.
- St. Peter SD, Aguayo P, Fraser JD, et al. Initial laparoscopic appendectomy versus initial nonoperative management and interval appendectomy for perforated appendicitis with abscess: a prospective, randomised trial. *J Pediatr Surg*. 2010;45:236–40.
- Marin D, Ho LM, Barnhart H, et al. Percutaneous abscess drainage in patients with perforated acute appendicitis: effectiveness, safety, and prediction of outcome. *AJR Am J Roentgenol*. 2010;194:422–9.
- Leung TT, Dixon E, Gill M, et al. Bowel obstruction following appendectomy: What is the true incidence? *Ann Surg*. 2009;250:51–3.
- Mui LM, Ng CS, Wong SK, et al. Optimum duration of prophylactic antibiotics in acute non-perforated appendicitis. *ANZ J Surg*. 2005;75:425–8.
- Schneider A, Sack U, Rothe K, et al. Peritoneal taurolidine lavage in children with localised peritonitis due to appendicitis. *Pediatr Surg Int*. 2005;21:445–8.
- Alajaimi J, Almansoor M, Almutawa A, Almusalam MM, Bakry H. Are Antibiotics the New Appendectomy?. *Cureus*. 2023;15(9):e44506.