

Study of Acute Appendicitis in Patients Admitted to a Tertiary Care Institute

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ABSTRACT

Background: Acute appendicitis is one of the most common causes of acute abdominal pain requiring emergency surgical admission. **Objective:** To evaluate the demographic profile, clinical presentation, diagnostic findings, management, complications, and outcomes of patients admitted with acute appendicitis in a tertiary care institute. **Methods:** This descriptive observational study was conducted at a tertiary care institute from August 2025 to July 2026. A total of 50 patients diagnosed with acute appendicitis were included using a non-probability consecutive sampling technique. Demographic characteristics, presenting symptoms, clinical findings, laboratory and radiological investigations, operative findings, management, postoperative complications, and hospital stay were recorded. **Results:** The mean age of the patients was 27.6 ± 10.8 years, and 31 (62.0%) were males. Right lower abdominal pain was present in 47 (94.0%) patients, while right iliac fossa tenderness was observed in 46 (92.0%). Leukocytosis was found in 38 (76.0%) and neutrophilia in 35 (70.0%) patients. Uncomplicated appendicitis was observed in 34 (68.0%) patients, while 16 (32.0%) had complicated appendicitis. Open appendectomy was performed in 48 (96.0%) patients. **Conclusion:** Acute appendicitis predominantly affected young adults and was more common among males. Most patients presented with right lower abdominal pain and right iliac fossa tenderness and had uncomplicated disease. Older age, fever, rebound tenderness, guarding, and leukocytosis were associated with complicated appendicitis. Early diagnosis and timely surgical management may reduce complications and duration of hospitalization.

Keywords: Acute appendicitis; appendectomy; complicated appendicitis.

INTRODUCTION

Appendicitis is a very common surgical emergency all over the world and is still a significant cause of an acute abdomen that requires hospitalisation [1]. It is caused by inflammation of the vermiform appendix, typically caused by obstruction of the appendiceal lumen by lymphoid hyperplasia, fecaliths, or other less common causes. Acute appendicitis is more commonly diagnosed in adolescents and young adults, but can happen at any age [2]. If not promptly diagnosed and treated, this can result in significant complications like appendiceal perforation, peri-appendiceal abscess, peritonitis, sepsis, and increased hospital stay. Acute appendicitis has many different clinical features [3]. The classic symptoms are abdominal pain, which starts around the belly button and then spreads to the right lower quadrant. This can be accompanied by vomiting,

nausea, loss of appetite, fever and localised tenderness [4]. Atypical presentations, however, are not uncommon, especially in children, elderly patients and pregnant women and in those with unusual positions of the appendix. Thus, thorough evaluation of the clinical history, physical examination, laboratory results and, if necessary, radiological examination by ultrasonography or computed tomography are necessary for the diagnosis. A number of clinical indices have been devised to help the clinician estimate the likelihood of acute appendicitis and minimise unnecessary investigations or 'negative appendectomies' [5]. A number of clinical indices have been devised to assist the clinician in estimating the likelihood of acute appendicitis and minimise unnecessary investigations or 'negative appendectomies'. Laboratory tests, including total

leukocyte count and the presence of neutrophils in blood, can help with the diagnosis and imaging may be helpful if the clinical features are uncertain or atypical. Although diagnostic methods have improved, it is still important to differentiate simple from complicated appendicitis as it may affect the management and the urgency of it [6].

Until now, appendectomy has been considered the standard therapy for acute appendicitis and can be done laparoscopically or open. If the appendix is deemed to be uncomplicated, antibiotics may also be considered in some of these patients; however, failure to respond or recurrent appendicitis are important concerns. Acute appendicitis can have different clinical, disease severity, complication, diagnostic and treatment outcomes across hospitals and populations [8]. Admitted patients undergoing evaluation in a tertiary care center can thus be valuable source of information concerning the demographic profile, common symptoms and signs, lab/imaging results, operative findings, complications and outcome of patients with acute appendicitis. This information can help with earlier diagnosis, clinical decision and prognosis, prompt surgical intervention, minimizing unnecessary complications and more efficient use of healthcare resources [9,10].

Therefore, the present study was conducted to evaluate acute appendicitis among patients admitted to a tertiary care institute, with particular emphasis on their demographic characteristics, clinical presentation, diagnostic findings, management, complications, and treatment outcomes.

METHODOLOGY

This descriptive observational study was conducted at a tertiary care institute from August 2025 to July 2026. A total of 50 patients fulfilling the eligibility criteria were included in the study. A non-probability consecutive sampling technique was used. All eligible patients admitted with acute appendicitis during the study period were included until the required sample size of 50 patients was achieved. Patients of either gender who were admitted with a clinical diagnosis of acute appendicitis were included in the study. Patients in whom the diagnosis was supported by clinical examination, laboratory investigations, radiological findings, and/or operative findings were considered eligible. Patients with other significant abdominal conditions mimicking acute appendicitis, and patients with incomplete clinical or investigation records were excluded from the study.

Data Collection

Data were collected using a structured data collection proforma. Demographic information, including age and gender, was recorded for each patient. Detailed clinical history was obtained regarding the onset,

duration, and site of abdominal pain, migration of pain, nausea, vomiting, anorexia, fever, and other associated symptoms. Clinical examination findings were documented, particularly right iliac fossa tenderness, rebound tenderness, guarding, rigidity, and other signs suggestive of acute appendicitis. Relevant laboratory investigations, including hemoglobin level, total leukocyte count, and differential leukocyte count, were recorded. Radiological investigations, particularly ultrasonography of the abdomen and pelvis, were also documented. Computed tomography was performed in selected patients when clinically indicated. The final diagnosis of acute appendicitis was established on the basis of clinical findings supported by laboratory and radiological investigations. In patients who underwent surgery, intraoperative findings were also recorded. Operative findings such as inflamed appendix, gangrenous appendix, perforation, appendicular mass, abscess formation, and peritonitis were documented. Information regarding the type of management, surgical procedure performed, postoperative complications, duration of hospital stay, and final outcome was recorded for each patient. The main parameters evaluated in the study included demographic characteristics, presenting symptoms and signs, laboratory and radiological findings, operative findings, frequency of complicated appendicitis, treatment provided, postoperative complications, duration of hospitalization, and patient outcome.

Statistical Analysis

The collected data were entered and analyzed using SPSS v26.0. Quantitative variables such as age, duration of symptoms, and duration of hospital stay were expressed as mean $\pm$ standard deviation. Qualitative variables such as gender, presenting symptoms, clinical findings, operative findings, type of treatment, and postoperative complications were presented as frequencies and percentages. The results were presented in the form of tables and graphs where appropriate.

RESULTS

Table 1 shows that the mean age of the patients was 27.6 ± 10.8 years, with the highest proportion belonging to the 21–30-year age group, accounting for 20 (40.0%) patients. Males were more commonly affected than females, comprising 31 (62.0%) of the study population. Right lower abdominal pain was the most frequent clinical feature, present in 47 (94.0%) patients, followed by right iliac fossa tenderness in 46 (92.0%), migration of pain in 36 (72.0%), nausea or vomiting in 33 (66.0%), anorexia in 30 (60.0%), rebound tenderness in 29 (58.0%), fever in 24 (48.0%), and guarding in 21 (42.0%). Leukocytosis and neutrophilia were observed in 38 (76.0%) and 35 (70.0%) patients, respectively.

Table 1. Demographic, Clinical, Laboratory and Radiological Characteristics of Patients with Acute Appendicitis (n = 50)

Variable	n (%) / Mean $\pm$ SD
Demographic characteristics	
Age, years	27.6 $\pm$ 10.8
≤ 20 years	12 (24.0%)
21–30 years	20 (40.0%)
31–40 years	10 (20.0%)
> 40 years	8 (16.0%)
Male	31 (62.0%)
Female	19 (38.0%)
Clinical presentation	
Right lower abdominal pain	47 (94.0%)
Right iliac fossa tenderness	46 (92.0%)
Migration of pain to right iliac fossa	36 (72.0%)
Nausea/vomiting	33 (66.0%)
Anorexia	30 (60.0%)
Rebound tenderness	29 (58.0%)
Fever	24 (48.0%)
Guarding	21 (42.0%)
Laboratory and radiological findings	
Leukocytosis	38 (76.0%)
Neutrophilia	35 (70.0%)
Ultrasonography suggestive of appendicitis	41 (82.0%)
CT abdomen performed	9 (18.0%)

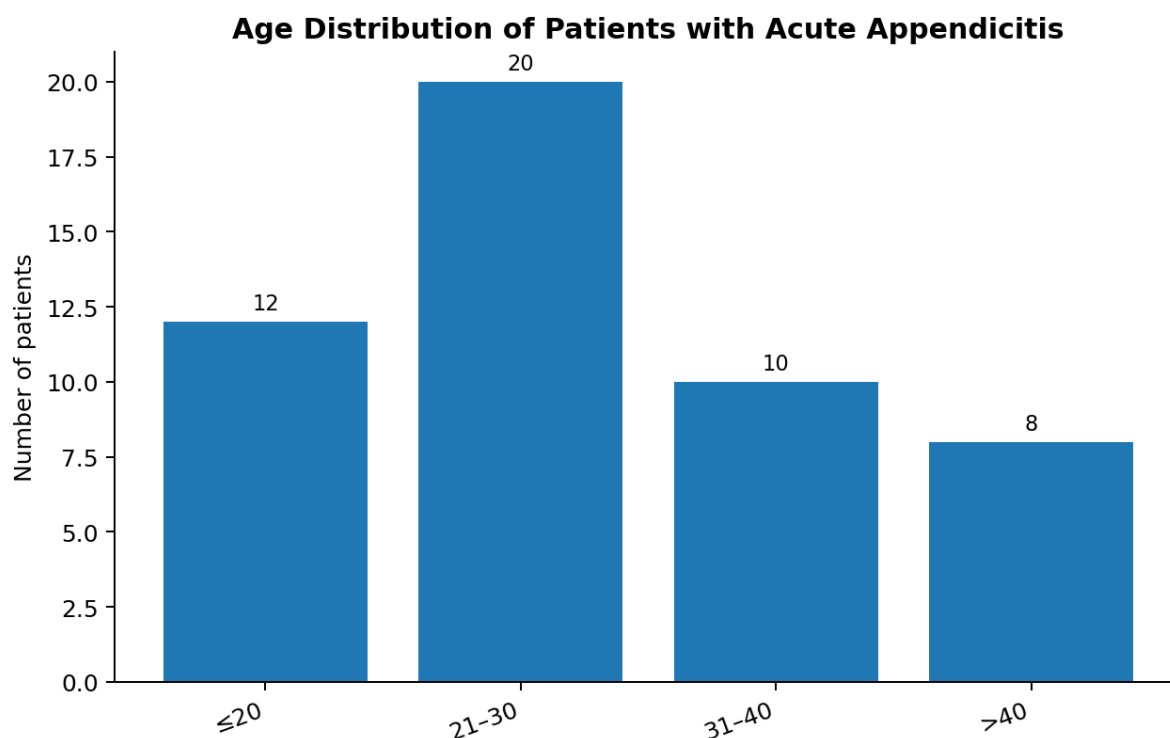


Figure 1. Age distribution of patients with acute appendicitis.

Uncomplicated inflamed appendix was found in 34 (68.0%) patients, while gangrenous appendix, perforated appendix, appendicular abscess, and appendicular mass were observed in 7 (14.0%), 5 (10.0%), 3 (6.0%), and 1 (2.0%) patient, respectively. Overall, 34 (68.0%) patients had uncomplicated appendicitis and 16 (32.0%) had complicated appendicitis.

Table 2. Operative Findings, Management and Clinical Outcomes of Patients (n = 50)

Variable	n (%) / Mean $\pm$ SD
Operative findings	
Uncomplicated inflamed appendix	34 (68.0%)
Gangrenous appendix	7 (14.0%)
Perforated appendix	5 (10.0%)
Appendicular abscess	3 (6.0%)
Appendicular mass	1 (2.0%)
Disease category	
Uncomplicated appendicitis	34 (68.0%)
Complicated appendicitis	16 (32.0%)
Management	
Open appendectomy	48 (96.0%)
Conservative management	2 (4.0%)
Clinical outcome	
No complication	42 (84.0%)
Surgical site infection	4 (8.0%)
Postoperative fever	3 (6.0%)
Intra-abdominal collection	1 (2.0%)
Mortality	0 (0.0%)
Hospital stay, days	3.6 $\pm$ 1.8

Table 3 compares uncomplicated and complicated appendicitis. Patients with complicated appendicitis were older than those with uncomplicated disease, with mean ages of 33.5 ± 11.3 years and 24.8 ± 8.9 years, respectively, and the difference was statistically significant ($p = 0.012$). Fever, rebound tenderness, guarding, and leukocytosis were significantly more frequent in complicated appendicitis, with p-values of 0.015, 0.005, 0.014, and 0.005, respectively. CT abdomen was also performed more frequently in complicated cases, with a significant difference ($p = 0.022$). The mean hospital stay was significantly longer in complicated appendicitis, 5.3 ± 1.8 days compared with 2.8 ± 1.1 days in uncomplicated cases ($p < 0.001$).

Table 3. Comparison of Clinical and Diagnostic Characteristics According to Severity of Acute Appendicitis

Variable	Uncomplicated Appendicitis n = 34	Complicated Appendicitis n = 16	p-value
Age, years, Mean $\pm$ SD	24.8 ± 8.9	33.5 ± 11.3	0.012
Male gender, n (%)	20 (58.8%)	11 (68.8%)	0.549
Migration of pain, n (%)	27 (79.4%)	9 (56.3%)	0.105
Fever, n (%)	12 (35.3%)	12 (75.0%)	0.015
Rebound tenderness, n (%)	15 (44.1%)	14 (87.5%)	0.005
Guarding, n (%)	10 (29.4%)	11 (68.8%)	0.014
Leukocytosis, n (%)	22 (64.7%)	16 (100.0%)	0.005
Neutrophilia, n (%)	21 (61.8%)	14 (87.5%)	0.099
Positive ultrasonography, n (%)	29 (85.3%)	12 (75.0%)	0.442
CT abdomen performed, n (%)	3 (8.8%)	6 (37.5%)	0.022
Hospital stay, days, Mean $\pm$ SD	2.8 ± 1.1	5.3 ± 1.8	<0.001

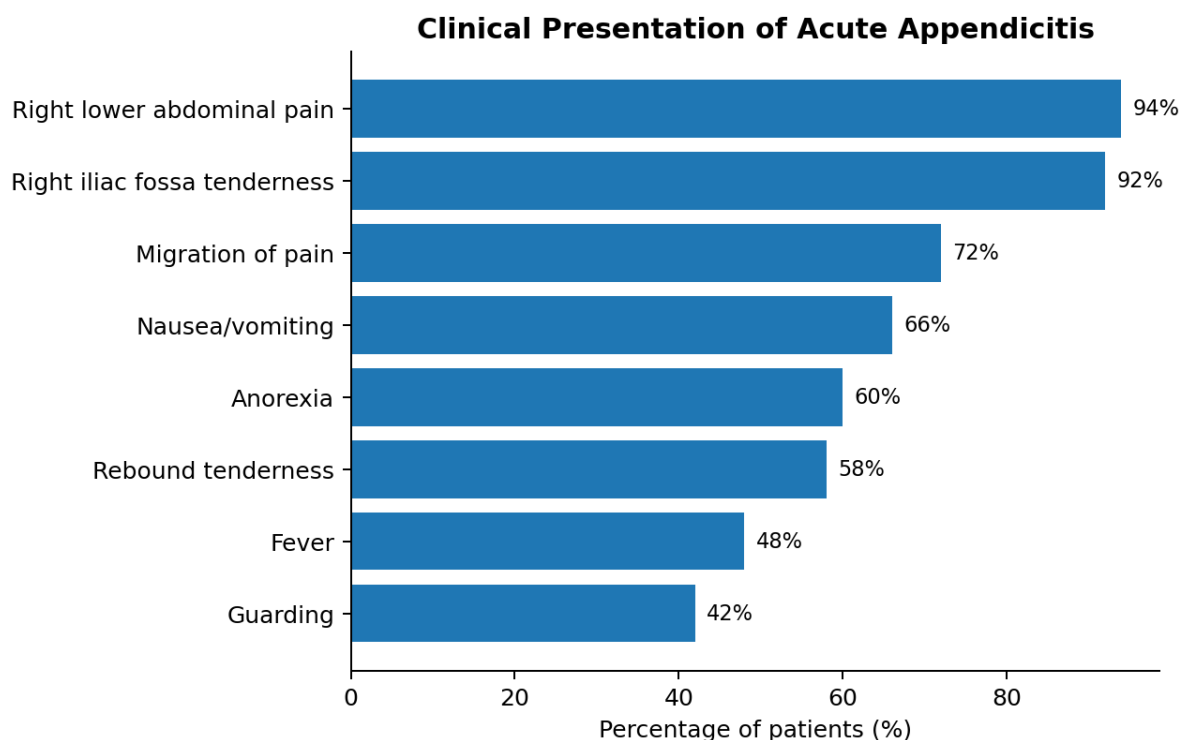


Figure 2. Distribution of major clinical features among patients with acute appendicitis.

DISCUSSION

Appendicitis is one of the most common surgical emergencies that needs to be diagnosed promptly and managed appropriately to avoid perforation, abscess, peritonitis and other complications. The current study included 50 patients admitted with AAPP, who were compared in regard to the demographic data, clinical symptoms, laboratory and radiologic data, severity, management and clinical outcomes. The findings illustrated that younger patients with acute appendicitis mainly consisted of those aged 27.6 ± 10.8 years (mean $\pm$ SD) and the majority of patients were in age group 21 to 30 years. This is similar to the epidemiology of acute appendicitis, which is known to be high in adolescents and young adults. Epidemiological studies in the world have also shown that the incidence of appendicitis is highest among younger age groups, whereas complications and mortality rates increase with age. The present study also found a male predominance in the sample with 31 (62.0%) males and 19 (38.0%) females [11]. The higher number of males is comparable to several reports of the clinical series of patients who are treated for acute appendicitis. But some differences have been noted in regard to the gender distribution within populations and in health care settings. In the present study, complicated appendicitis was not significantly associated with gender ($p = 0.549$), thus indicating that the severity of the disease is more related to clinical and inflammatory characteristics than to gender [12].

As regards the clinical presentation, the most common was the right lower abdominal pain (94.0%) followed by right iliac fossa tenderness (92.0%). Of the 72.0%, who complained of migration of pain to the right iliac fossa, 66.0%, 60.0%, and 48.0% complained of

nausea/vomiting, anorexia, and fever, respectively [13]. The results underscore the need for careful history and physical exam in patients presenting with possible acute appendicitis. No single symptom or sign is reliable enough to make a diagnosis alone, but the presence of typical abdominal pain with local tenderness, inflammatory signs and appropriate imaging greatly enhance diagnostic accuracy. Similar to current international guidelines, clinical assessment is also recommended with scoring systems, laboratory parameters, and selective imaging and not an isolated clinical feature. In this study, 34 patients (68.0%) presented with uncomplicated acute appendicitis while 16 patients (32.0%) had complicated disease. The complicated presentations included gangrenous appendicitis (14.0%), perforation (10.0%), appendicular abscess (6.0%) and appendicular mass (2.0%). The percentage of complicated cases emphasizes the need for early presentation, speedy diagnostic assessment, and early treatment. Late onset and development of inflammation can result in gangrene, perforation and abscess. Current guidelines focus thus on the distinction between simple and complicated appendicitis, as the classification has significant implications with regard to surgery timing, antibiotic treatment and decision-making about non-operative management [14-16].

There was also a significant relationship between age and disease severity. The mean age of patients with complicated appendicitis was 33.5 ± 11.3 years, while it was 24.8 ± 8.9 years in patients with uncomplicated appendicitis ($p = 0.012$). This is in accord with data that have shown that complicated appendicitis is more common in the elderly. A recent adult cohort study also found older age, guarding, inflammatory markers, and

CT findings to be each independent risk factors for complicated disease [17]. These results indicate that the clinician should have a higher index of suspicion for complicated disease in older patients with moderate to severe inflammatory or peritoneal signs. In terms of treatment, 48(96.0%) patients had open appendectomy and 2 (4.0%) were treated conservatively. Open approach was the predominant approach in the present study. The present study had some limitations. This is because of the relatively small sample size (50 patients) and the single-center design limiting the generalizability of the results. Some studies were also carried out selectively based on the clinical indications, and this could have affected the comparison of uncomplicated and complicated cases. More robust information about predictors and outcomes of complicated acute appendicitis would be provided by larger multicenter studies with standardized diagnostic protocols, inflammatory markers, such as C-reactive protein, histopathology, and longer postoperative follow-up.

CONCLUSION

It is concluded that acute appendicitis predominantly affected young adults and was more frequently observed in males. Right lower abdominal pain and right iliac fossa tenderness were the most common clinical features, while leukocytosis and neutrophilia were frequent laboratory findings. Most patients had uncomplicated appendicitis and were successfully managed by appendectomy, with open appendectomy being the most commonly performed procedure. Complicated appendicitis was observed in nearly one-third of patients and was significantly associated with older age, fever, rebound tenderness, guarding, leukocytosis, and a longer duration of hospital stay. Overall postoperative outcomes were favorable, with a low frequency of complications and no mortality.

DECLARATIONS

Ethics Approval and Consent to Participate

The study was conducted in accordance with institutional ethical standards. Ethical approval was obtained from the appropriate institutional ethics committee before commencement of the study. Written informed consent was obtained from all participants included in the study.

Consent for Publication

Not applicable.

Availability of Data and Materials

The data supporting the findings of this study are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

All authors contributed to the conception and design of the study, data collection, analysis and interpretation of the findings, and preparation and critical revision of the manuscript. All authors approved the final version of the manuscript.

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AI Use Disclosure

The authors declare that no generative artificial intelligence tools were used to generate or substantially modify the scientific content of this manuscript.

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