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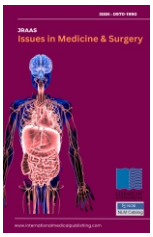

Research Article

Section: Surgery

A Prospective Study of Clinical Profile of Acute Appendicitis & Its Correlation with Ultrasonography Findings In Patients Admitted In J.A. Group of Hospitals, Gwalior

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HIGHLIGHTS

- Clinical signs correlate with USG
- USG improves diagnostic accuracy
- Early diagnosis enables timely surgery
- Young males most affected
- Early screening prevents complications

Key Words:
Acute Appendicitis
Ultrasonography
Clinical Correlation
Mcburney's Tenderness
Probe Tenderness

ABSTRACT

Introduction: Acute appendicitis remains one of the most common causes of acute abdomen requiring emergency surgical intervention. Despite classical signs and symptoms, its variable presentation can complicate diagnosis, leading to delayed treatment and serious complications. Ultrasonography (USG), being radiation-free, cost-effective, and readily available, plays a pivotal role in the diagnostic workup, especially in settings with limited access to advanced imaging. **Aim & Objective:** To study the clinical profile of patients with acute appendicitis and correlate clinical features with ultrasonographic findings to improve diagnostic precision and surgical outcomes. **Materials & Methods:** This prospective observational study was conducted over 18 months in the Department of General Surgery, J.A. Group of Hospitals, Gwalior, involving 89 patients aged 16–60 years with a provisional diagnosis of acute appendicitis. Detailed clinical history, physical examination, and ultrasonographic evaluations were performed. Diagnosis was confirmed intraoperatively. Data was analyzed for demographic distribution, clinical features, USG parameters, and outcomes. **Results:** Most patients were males (67.41%) aged between 21–30 years. All presented with central abdominal pain migrating to the right iliac fossa. McBurney's point tenderness and rebound tenderness were noted in 100% of cases. Ultrasonographically, probe tenderness was present in 97.75%, and the mean appendiceal diameter was 7.43 ± 0.98 mm. All cases showed concordance between clinical, USG, and intraoperative diagnosis. There were no complications or mortality, and all patients had a full recovery. **Conclusion:** This study demonstrated a strong correlation between clinical signs and ultrasonographic findings in acute appendicitis. Combining both modalities improves diagnostic accuracy, enables timely surgical intervention, and reduces the risk of negative appendectomy and associated complications.

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INTRODUCTION

Acute appendicitis refers to the inflammation of the vermiform appendix, a narrow, tube-like structure attached to the cecum of the large intestine, situated in the right iliac region of the abdomen [1]. It is a leading cause of emergency abdominal surgeries globally and represents one of the most frequent surgical emergencies encountered in adults. In India, the estimated prevalence stands at around 8%, with the highest incidence occurring among individuals between the ages of 10 and 30 [2]. The overall prevalence reported in various hospital-based studies is approximately 44.27%, reflecting its significant burden on emergency surgical services. In the United States, acute appendicitis contributes to nearly 300,000 hospital admissions annually. Typically, patients develop symptoms within the first 24 hours, and acute abdominal pain related to appendicitis accounts for about 7% to 10% of emergency room visits [3,4]

The diagnostic challenge of acute appendicitis stems from its highly variable presentation. Nearly half of all cases exhibit atypical or non-classical symptoms, complicating prompt and accurate diagnosis. The clinical manifestations often overlap with other intra-abdominal and pelvic pathologies, making it difficult to differentiate solely based on clinical evaluation. Despite the emergence of non-surgical management approaches, such as antibiotic therapy, surgery remains the definitive treatment for most patients. Laparoscopic appendectomy, in particular, is considered the standard of care due to its safety, low complication rate, and shorter recovery time. Nevertheless, undiagnosed or delayed cases can lead to serious complications, including perforation of the appendix, localized or generalized peritonitis, sepsis, and death [5].

From a clinical standpoint, appendicitis usually begins as vague periumbilical discomfort that later localizes to the right lower quadrant of the abdomen. This migratory pain, often colicky in nature, is accompanied by symptoms like anorexia, nausea, vomiting, and low-grade fever. However, not all patients present these textbook symptoms, which can obscure the diagnosis. While the condition affects both men and women, studies show a slight male predominance, particularly in the second and third decades of life. The precise pathogenesis of acute appendicitis is not completely understood, though luminal obstruction is widely accepted as the initiating event. Causes of obstruction may include fecaliths, lymphoid hyperplasia, parasitic infestation, or foreign bodies. Contributing factors also include low dietary fiber intake and familial predisposition [6].

In ambiguous clinical scenarios, imaging plays a pivotal role in confirming the diagnosis and ruling out differential conditions. Among the imaging modalities, ultrasonography and computed tomography have emerged as primary tools. CT is particularly valued for its high diagnostic accuracy, especially in adult populations. However, ultrasonography remains widely used due to its advantages, including absence of radiation exposure, cost-effectiveness, portability, and real-time assessment capabilities. USG is especially recommended in pediatric and pregnant patients where radiation poses significant risks. The technique of graded-compression ultrasonography is typically employed to visualize the appendix by displacing overlying bowel gas and enhancing anatomical clarity [7].

Normal appendiceal dimensions have been established through imaging studies, with a mean anteroposterior diameter of approximately 4.4 mm and a mean transverse diameter around 5.1 mm. These values are relatively consistent across age groups and are used to distinguish normally from inflamed appendices. Sonographic indicators suggestive of acute appendicitis include a non-compressible, blind-ending tubular structure with an outer diameter exceeding 6 mm, localized tenderness on probe pressure, periappendiceal fat stranding, and the presence of free fluid or an appendicolith. Despite these criteria, the diagnostic utility of USG remains inconsistent due to factors such as operator experience, body habits, bowel gas interference, and disease progression. Literature reports a wide variability in ultrasonographic sensitivity, ranging from 44% to 100%, and specificity from 47% to 100%, making it a useful but not infallible tool [8].

Given these limitations, reliance on a combination of clinical judgment and imaging findings becomes essential. The integration of ultrasonography with clinical assessment improves diagnostic precision and helps stratify patients who require urgent surgical intervention from those who may be managed conservatively or need further evaluation. The variability in sonographic accuracy underlines the necessity for continuous training and standardization of techniques among radiologists and emergency physicians [9].

In clinical practice, accurate diagnosis of acute appendicitis is crucial to avoid unnecessary appendectomies and prevent complications related to delayed treatment. While CT remains the gold standard in radiological evaluation, ultrasonography continues to play a valuable role, particularly in settings with limited access to advanced imaging technology. Through careful interpretation of sonographic findings in conjunction with clinical features, physicians can enhance decision-making processes in emergency settings and ensure timely, appropriate care for patients presenting with suspected acute appendicitis [10].

The present study aims to evaluate the clinical profile of acute appendicitis cases and correlate them with ultrasonographic findings. It focuses on analyzing the distribution of cases based on clinical signs and ultrasonographic evidence, assessing the accuracy of clinical diagnosis, and determining how well clinical features align with ultrasound findings considered suggestive of acute appendicitis, thereby improving diagnostic reliability.

MATERIALS & METHODS

After obtaining approval from the Institutional Human Ethical Committee (LOP-AIIMS/BPL/IHECSR/JULY/22/PG/05), this prospective hospital-based study was conducted over one and a half years in the Department of General Surgery at J.A. Group of

including 89 patients who met the inclusion and exclusion criteria. Patients aged 16–60 years with a provisional diagnosis of acute appendicitis and who gave written informed consent were included. Exclusion criteria comprised patients below 16 or above 60 years, those with appendicular perforation, abscess, or generalized peritonitis, and unwilling participants. Confidentiality was maintained, and all identifiers were removed during data analysis.

RESULT

In this study, most patients were aged 21–30 years (37.07%), followed by 31–40 years (24.71%), with 16.85% each in the <20 and 41–50 years groups, and only 4.49% above 50 years. The mean age was 31.63 ± 10.58 years, ranging from 15 to 62 years. Males constituted the majority at 67.41% (60 cases), while females accounted for 32.58% (29 cases), indicating a higher prevalence of acute appendicitis among younger males. **Table 1** shows that all 89 patients (100%) presented with central abdominal pain initially, which later shifted to the right iliac fossa, both hallmark symptoms of acute appendicitis. This uniform symptom pattern supports clinical diagnosis. The consistency reinforces the diagnostic reliability of these presenting signs in suspected cases. **Figure 1** indicates that most patients (41%) experienced pain for 25–48 hours before presentation, followed by 33% with pain lasting more than 48 hours, and only 26% presented within 24 hours. This suggests delayed healthcare-seeking behavior in many cases. Prolonged symptom duration may be associated with increased risk of complications like perforation or abscess. **Table 2** shows that none of the 89 patients had a previous history of appendicitis, indicating all cases were first-time presentations. This supports the acute nature of the condition. It also implies that recurrence or chronic appendicitis was not a contributing factor in this cohort. The mean pulse rate of 90.45/min suggests mild tachycardia, commonly associated with pain or early systemic response in acute appendicitis. The slightly lower meaning systolic (103.10 mm Hg) and diastolic (68.74 mm Hg) pressures may reflect early hemodynamic changes or dehydration. Overall, these parameters align with typical early clinical findings in acute appendicitis **(Table 3)**. On local examination, all 89 patients (100%) showed McBurney's point tenderness and rebound tenderness, confirming localized peritoneal irritation. Rovsing's sign was positive in only 1 patient (1.12%) and absent in the remaining 88 cases (98.87%). Neither the psoas sign nor the obturator sign was elicited in any of the patients (0%), indicating limited retrocecal or pelvic appendix involvement in this study population **(Figure 2)**. The general and systemic examinations revealed no abnormalities in all 89 patients, with absent pallor, icterus, clubbing, cyanosis, edema, and lymphadenopathy, and normal cardiovascular, respiratory, and neurological findings. All patients were alert and hemodynamically stable. Abdominal tenderness was universally present (100%), reinforcing localized abdominal pathology consistent with acute appendicitis **(Table 4)**. Ultrasonographic evaluation showed no cases with appendiceal fluid collection, wall thickening, or hyperechoic appendicolith. However, probe tenderness was noted in 97.75% (87 patients), with only 2.24% (2 patients) lacking this sign. The mean appendiceal diameter measured 7.43 mm with a standard deviation of 0.98 mm, supporting the diagnosis of appendicitis based on diameter criteria and localized tenderness on sonographic examination **(Figure 3)**. **Table 5** shows complete diagnostic concordance, with all 89 patients initially diagnosed with acute appendicitis confirmed postoperatively. This 100% correlation reflects high clinical accuracy in diagnosing appendicitis. It also indicates effective use of clinical and radiological criteria in preoperative evaluation. The clinical outcome data shows that all 89 patients (100%) recovered without any complications or mortality. This reflects effective diagnosis and timely surgical management of acute appendicitis. The absence of adverse outcomes indicates a high standard of perioperative care in the study population **(Table 6)**.

Table 1: Distribution of cases according to presenting symptoms. (N = 89)

Presenting symptoms	Number of cases
Central abdominal pain	89 (100%)
Pain shifting to right iliac fossa	89 (100%)

Table 2: Distribution of cases according to previous history of appendicitis. (N = 89)

Previous history of appendicitis	Number of cases
Present	0 (0%)
Absent	89 (100%)

Table 3: Mean hemodynamic parameters. (N = 89)

Hemodynamic parameters	Mean (SD)
Pulse rate (per min)	90.45 (13.51)
Systolic blood pressure (mm Hg)	103.10 (10.26)
Diastolic blood pressure (mm Hg)	68.74 (6.77)

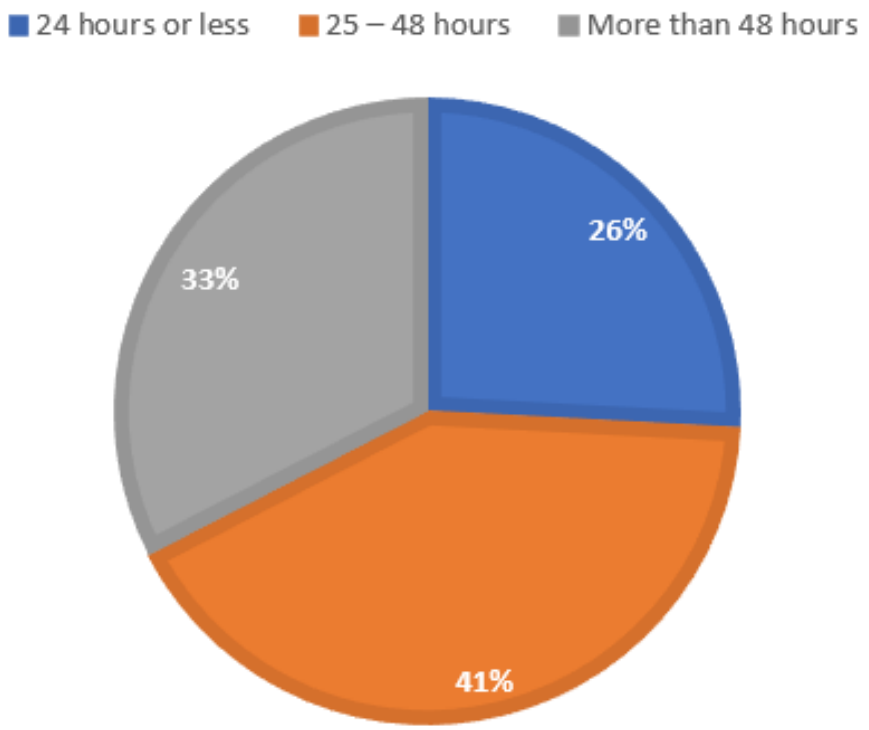

Figure 1: Distribution of cases according to duration of pain

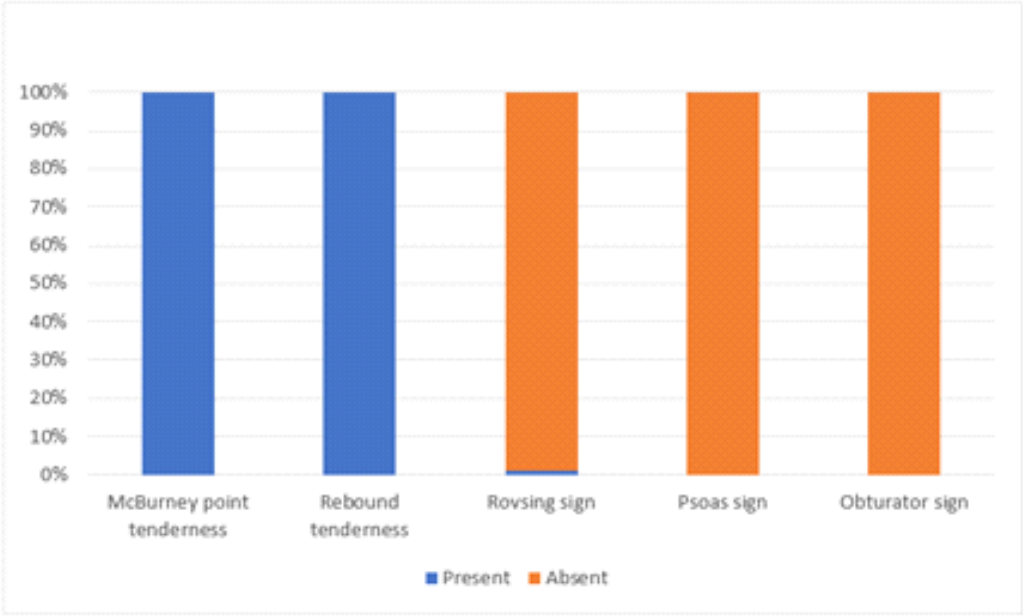

Figure 2: Distribution of cases according to finding on local examination

Table 4: Distribution of cases according to findings on general examination. (N = 89)

General Examination	Cases	Number of cases
General physical examination	Pallor	Absent: 89 (100%)
	Icterus	Absent: 89 (100%)
	Clubbing	Absent: 89 (100%)
	Cyanosis	Absent: 89 (100%)
	Oedema	Absent: 89 (100%)
	Lymphadenopathy	Absent: 89 (100%)
Systemic physical examination	Cardiovascular	S1S2 heard: 89 (100%)
	Respiratory	Bilateral equal air entry: 89 (100%)
	Central nervous system	Oriented: 89 (100%)
	Per abdomen	Tenderness present: 89 (100%)

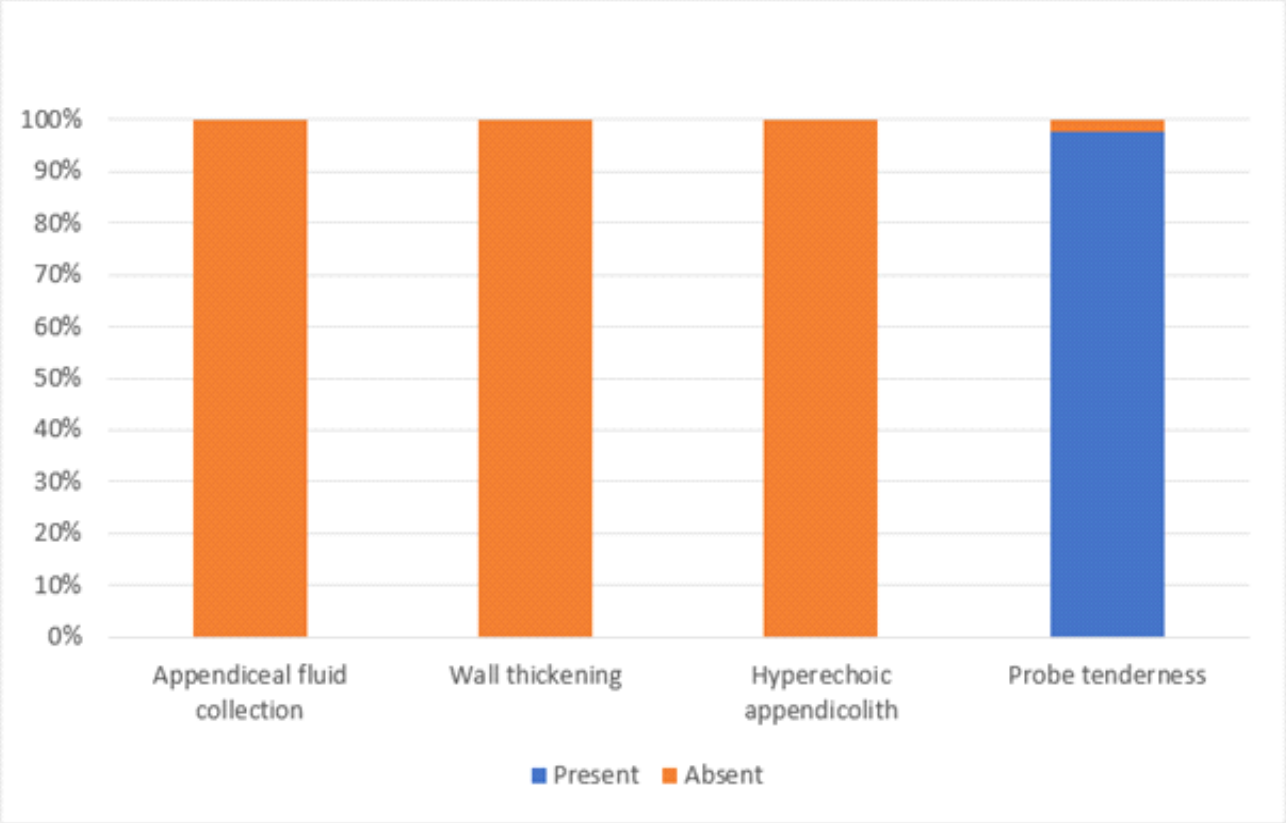

Figure 3: Distribution of cases according to ultrasonographic findings

Table 5: Distribution of cases according to provisional and final diagnosis. (N = 89)s

Final diagnosis	Cases	Number of cases
Provisional diagnosis	Acute appendicitis	89 (100%)
Final diagnosis	Acute appendicitis	89 (100%)

Table 6: Distribution of cases according to clinical outcome. (N = 89)

Clinical outcome	Number of cases
Recovered	89 (100%)
Mortality	0 (0%)
Complications	0 (0%)

DISCUSSION

This prospective study aims to assess the association between the clinical profile and ultrasonographic (USG) findings in cases of acute appendicitis. By evaluating the correlation between clinical signs and symptoms with USG features, the study seeks to enhance diagnostic accuracy and support improved clinical decision-making. The findings are intended to contribute to existing knowledge and assist clinicians in making timely and precise diagnoses of acute appendicitis, ultimately leading to better patient outcomes through informed surgical intervention.

In the present study involving 89 patients aged 15–62 years (mean age 31.63 ± 10.58 years), the majority (37.07%) were in the 21–30-year age group, with fewer cases in older or younger brackets. This aligns with findings by **Shobha C et al.** [11]**,** who reported peak incidence in the third decade, and **Sarla G et al.** [12], who noted common occurrence between 10–20 years. A male predominance (67.41%) was observed, like **Sarla G et al.** [11] and **Hume DJ et al.** [13], who reported male-to-female ratios of 1.76:1 and 1.4:1, respectively, supporting a higher lifetime risk among males.

All 89 patients (100%) presented with central abdominal pain shifting to the right iliac fossa, consistent with classical acute appendicitis symptoms. **Lapsa S et al.** [14] reported similar findings, noting lower abdominal pain (93.9–97.6%) and shifting pain (30.3-45.1%) as common symptoms. Andy P et al. confirmed pain and localized tenderness as key diagnostic features. Most patients (41.57%) had pain for 24–48 hours (mean: 47.37 ± 17.47 hours). No patient reported a prior history of appendicitis. **Emiliano G et al.** [16] noted delayed pain presentation in the elderly, emphasized typical migratory pain patterns.

In this study, the mean pulse rate was 90.45 ± 13.51 bpm, mean systolic BP 103.10 ± 10.26 mmHg, and diastolic BP 68.74 ± 6.77 mmHg. Thiyagarajan et al. reported pulse rates of 86±19 in confirmed appendicitis and 95±17 in normal appendix cases. **Matta A et al.** [18] observed stable vitals in confirmed appendicitis. On physical exam, all 89 patients had normal general and systemic findings with abdominal tenderness. Similar findings were noted by Gupta et al. and **Khadka M et al.**, [20] who reported stable vitals and absence of abnormal general signs in appendiceal pathology.

In this study, all 89 patients (100%) had McBurney's point and rebound tenderness; only 1 case (1.12%) showed Rovsing's sign, while Psoas & Obturator signs were absent. **Krzyzak M et al.** [21] associated Rovsing's sign with barium studies, and Yale SH highlighted McBurney's tenderness as diagnostically valuable. Ultrasonography showed probe tenderness in 97.75% cases, with no appendiceal fluid, wall thickening, or appendicoliths; the mean appendiceal diameter was 7.43 ± 0.98 mm. **Mostbeck G et al**. [23] advocated USG as the first-line modality. **Sholy K et al.** [24] and **Faheem M et al.** [25] also demonstrated high diagnostic accuracy of USG, with Faheem reporting 95% sensitivity and a 98.9% positive predictive value for acute appendicitis.

In this study, all 89 patients (100%) were clinically and ultrasonographically diagnosed with acute appendicitis, confirmed intraoperatively, with 100% recovery, no mortality, and no post-operative complications. **Skjold-Ødegaard B et al.** [26] highlighted that clinical diagnosis alone may lead to up to 36% negative appendectomy rates, underscoring the importance of imaging. **Ahmed R. M et al.** [27] emphasized USG's value in pre-surgical planning and recurrence prediction. The strong correlation between clinical signs and USG findings supports their combined use. However, the study's limitations include a small sample size and lack of long-term follow-up, warranting further research to strengthen conclusions.

CONCLUSION

The study aimed to correlate clinical symptoms with ultrasonographic findings in acute appendicitis to improve diagnostic accuracy and outcomes. Most cases were males aged 21–30 years, and all presented with central abdominal pain shifting to the right iliac fossa, typically lasting 24-48 hours. No patient had a prior history of appendicitis. Hemodynamic and systemic examination findings were normal. McBurney's point tenderness and rebound tenderness were present in all cases, while probe tenderness was the most consistent ultrasonographic sign. The study emphasizes the importance of combining clinical and ultrasonographic parameters for timely diagnosis and effective management of acute appendicitis.

LIMITATIONS & FUTURE PERSPECTIVES

The study's limitations include a single-centre setting, a relatively small sample size, and a short study duration, which may limit the broader applicability of the results. Future studies should incorporate multicentre designs with larger populations to enhance validity, assess long-term outcomes, and investigate

advanced diagnostic and management approaches. Such efforts will improve overall patient care and help minimize complications.

CLINICAL SIGNIFICANCE

The clinical significance of this study lies in its potential to bridge the gap between research findings and practical healthcare applications. It emphasizes the importance of trans-lating scientific observations into meaningful improve-ments in patient care, diagnosis, and treatment outcomes. By highlighting real-world relevance, the study contributes to evidence-based medical practice and supports informed clinical decision-making. Ultimately, the findings aim to enhance patient quality of life, optimize therapeutic strategies, and promote better disease management in clinical settings.

ABBREVIATIONS

USG: Ultrasonography
RIF: Right Iliac Fossa
AA: Acute Appendicitis
WBC: White Blood Cell Count

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AUTHOR CONTRIBUTIONS

All authors significantly contributed to the study conception and design, data acquisition, or data analysis and interpretation. They participated in drafting the manuscript or critically revising it for important intellectual content, consented to its submission to the current journal, provided final approval for the version to be published, and accepted responsibility for all aspects of the work. Additionally, all authors meet the authorship criteria outlined by the International Committee of Medical Journal Editors (ICMJE) guidelines.

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CONFLICT OF INTEREST

Authors declared that there is no conflict of interest.

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ETHICAL APPROVAL & CONSENT TO PARTICIPATE

All necessary consent & approval was obtained by authors.

CONSENT FOR PUBLICATION

All necessary consent for publication was obtained by authors.

DATA AVAILABILITY

All data generated and analyzed are included within this research article. The datasets utilized and/or analyzed in this study can be obtained from the corresponding author upon a re-asonable request.

USE OF ARTIFICIAL INTELLIGENCE (AI) & LARGE LANGUAGE MODEL (LLM)

The authors confirm that no AI & LLM tools were used in thewriting or editing of the manuscript, and no images were altered or manipulated using AI & LLM.

AUTHOR'S NOTE

This article serves as an important educational tool for the scientific community, offering insights that may inspire future research directions. However, they should not be relied upon independently when making treatment decisions or developing public health policies.

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REFERENCE

1. Ge H, Miao L, Zhang F, Lin Z, Zhang L, Dou R, et al. Overview of the ultrasonography techniques in the diagnosis of appendicitis: elaboration of a novel anatomy scanning method. Med Ultrason. 2020;22(3):1-11.
2. Singh A, Parihar US, Kumawat G, Samota R, Choudhary R. To determine validation of RIPASA score in diagnosis of suspected acute appendicitis and histopathological correlation with applicability to Indian population: a single institute study. Int J Surg. 2018;80:113–117.
3. Addiss DG, Shaffer N, Fowler BS, Tauxe RV. The epidemiology of appendicitis and appendectomy in the United States. Am J Epidemiol. 1990;132(5):910–925.
4. Cervellin G, Mora R, Ticinesi A, Meschi T, Comelli I, Catena F, et al. Epidemiology and outcomes of acute abdominal pain in a large urban emergency department: retrospective analysis of 5,340 cases. Ann Transl Med. 2016;4(19):1-8.
5. Garba S, Ahmed A. Appendicitis in the elderly. In: Lander A, editor. Appendicitis: a collection of essays from around the world. Rijeka: InTech; 2012. p. 107–132.
6. Sytnik OL, Leonov VV, Petrenko VYu. Emergency abdominal surgery: study aid recommended by the Ministry of Education, Science, Youth and Sports of Ukraine. Sumy: Sumy State University; 2012:45-60.
7. Hussain S, Mubeen I, Ullah N, Shah SSUD, Khan BA, Zahoor M, et al. Modern diagnostic imaging technique applications and risk factors in the medical field: a review. 2022;2022(1):1-19.
8. Willekens I, Peeters E, De Maeseneer M, De Mey J. The normal appendix on CT: does size matter? PLoS One. 2014;9(5):1-7.
9. de Casasola GG, López IC, Torres-Macho J. Clinical ultrasonography in the decision-making process in medicine. Rev Clin Esp. 2020;220(1):49–56.
10. Moris D, Paulson EK, Pappas TN. Diagnosis and management of acute appendicitis in adults: a review. JAMA. 2021;326(22):2 299–22311.
11. Shobha C, Sushrutha G, Bhimanagouda V. Diagnostic accuracy of the RIPASA score in suspected acute appendicitis in adults: a cross-sectional study comparing it with histopathological findings from Bagalkot, India. Int J Anat Radiol Surg. 2023;12(5):35-38.
12. Sarla S. Acute appendicitis: age, sex and seasonal variation. J Med Sci Clin Res. 2018;6(6):262–264.
13. Humes D, Simpson J. Acute appendicitis. Br. Med. J. 2006;333(7567):530–534.
14. Lapsa S, Ozolins A, Strumfa I, Gardovskis J. Acute appendicitis in the elderly: a literature review on an increas-ingly frequent surgical problem. Geriatrics. 2021;6(3):1-8.
15. Petroianu A. Diagnosis of acute appendicitis. Int J Surg. 2012;10(3):115–119.
16. Laos EGM, Ducas A, Huh N, Mangano A, Lopez P, Masrur MA. Challenges in management of acute appendicitis: a narrative review. Curr Probl Surg. 2024:1-13.
17. Thiyagarajan U, Shah I, Ponnuswamy A, Willson P. Role of temperature, pulse rate and clinical examination on predicting acute appendicitis: a single centre study. Int J Surg. 2017;47:38–39.
18. Matta A, Koppala J, Reddymasu SC, Lanspa S. Acute appendicitis: a potential complication of video capsule endoscopy. Case Rep. 2014;2014:1-3.
19. Gupta P, Mishra AK, Deo A, Yadav R, KC M, Bhattarai A. Complete small intestinal obstruction due to band formation in low-grade appendiceal mucinous neoplasm: a rare case report and literature review. Int J Surg Case Rep. 2023;108:1-5.
20. Khadka M, Basukala S, Khadka M, KC M, Karki G, Gurung A. A rare case of an inflammatory myofibroblastic tumor of the appendix presenting as acute appendicitis: a case report. Int J Surg Case Rep. 2023;105:1-4.
21. Krzyzak M, Mulrooney SM. Acute appendicitis review: background, epidemiology, diagnosis, and treatment. Cureus. 2020;12(6):1-6.
22. Yale SH, Musana KA. Charles Heber McBurney (1845-1913). Clin Med Res. 2005;3(3):187–189.
23. Mostbeck G, Adam EJ, Nielsen MB, Claudon M, Clevert D, Nicolau C, et al. How to diagnose acute appendicitis: ultrasound first. Insights Imaging. 2016;7:255–263.
24. Sholy K, Mathew DP, Abdu FN, Latheef A, Alias S. Assessment of correlation between ultrasonographic and surgical findings in acute appendicitis patients. Int J Adv Med Pharm. 2022;4(5):396–398.
25. Inamdar MF, Malagimani SC, Hubli P, Meti RM, Banu SS, Mugadur S, et al. Clinical correlation of acute appendicitis with ultrasound examination and histopathology of appendix. J Evol Med Dent Sci. 2014;3(23):6352–6361.
26. Skjold-Ødegaard B, Søreide K. The diagnostic differentiation challenge in acute appendicitis: how to distinguish between uncomplicated and complicated appendicitis in adults. Diagnostics. 2022;12(7):1-8.
27. Ahmed RM. The role of ultrasound in diagnosis of acute appendicitis: a review article. J Pharm Res Int. 2021;33(53B) :5–10.