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Original Research Article

PROSPECTIVE STUDY OF ULTRASOUND-BASED APPENDICITIS SCORING IN CHILDREN WITH RIGHT ILIAC FOSSA PAIN: CORRELATION WITH SURGICAL/HISTOPATHOLOGY OUTCOMES

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ABSTRACT

Background: Acute appendicitis is one of the most common surgical emergencies in children and a frequent cause of right iliac fossa pain. Early and accurate diagnosis remains challenging because clinical features may overlap with other causes of abdominal pain, and delayed diagnosis can lead to perforation and increased morbidity. Ultrasonography is a safe, noninvasive, and radiation-free imaging modality widely used in children. An ultrasound-based appendicitis scoring system may improve diagnostic accuracy and assist in correlating imaging findings with operative and histopathological outcomes. The aim is to evaluate the usefulness of an ultrasound-based appendicitis scoring system in children presenting with right iliac fossa pain and to correlate the sonographic score with surgical and histopathological outcomes.

Materials and Methods: This prospective observational study was conducted at a tertiary care hospital and included 74 pediatric patients presenting with right iliac fossa pain and clinically suspected acute appendicitis. Detailed demographic, clinical, laboratory, and ultrasonographic data were collected using a structured proforma. Clinical parameters included migration of pain, vomiting, anorexia, fever, right iliac fossa tenderness, rebound tenderness, and guarding. Laboratory parameters included total leukocyte count and neutrophil percentage. Ultrasonographic evaluation was performed using graded compression technique and color Doppler where required. Sonographic scoring was based on appendiceal diameter greater than 6 mm, non-compressibility, mural wall thickening, appendicolith, periappendiceal inflammatory changes, fluid collection, and increased vascularity. Surgical findings and histopathological examination were used for correlation. Data were analyzed using SPSS version 27.0.

Results: The mean age of the study population was approximately 11 years, with male predominance (56.76%). Leukocytosis was present in 71.62% and neutrophilia in 64.86% of patients. The most common ultrasound findings were appendiceal diameter >6 mm (66.22%), non-compressible appendix (60.81%), and mural wall thickening (50.00%). Histopathology confirmed appendicitis in 54 patients (72.97%). A significant association was observed between ultrasound score categories and histopathological outcome (p=0.001). The ultrasound-based scoring system showed sensitivity of 87.04%, specificity of 70.00%, positive predictive value of 88.68%, negative predictive value of 66.67%, and diagnostic accuracy of 82.43%.

Conclusion: Ultrasound-based appendicitis scoring is a reliable and effective diagnostic tool in children with right iliac fossa pain. It shows good correlation with surgical and histopathological outcomes and can aid early diagnosis, risk stratification, and clinical decision-making while reducing unnecessary surgery.

Keywords: Acute appendicitis; Children; Ultrasonography; Right iliac fossa pain; Histopathology.

INTRODUCTION

Acute appendicitis is one of the most common causes of emergency abdominal surgery in children and remains a major diagnostic challenge in routine pediatric practice. The diagnosis is often straightforward in children with classical symptoms and localized signs, but many patients present with vague or evolving complaints that overlap with gastroenteritis, mesenteric adenitis, constipation, urinary tract infection, or gynecological causes in older girls. In children, delayed recognition can lead to perforation, abscess formation, prolonged hospitalization, and increased postoperative morbidity, while overdiagnosis may result in unnecessary surgery and removal of a normal appendix. Because of this dual risk, there is continued interest in improving diagnostic accuracy using structured clinical assessment supported by appropriate imaging and laboratory evaluation.[1] The evaluation of a child with right iliac fossa pain requires careful integration of history, physical examination, and inflammatory markers. Symptoms such as migration of pain, anorexia, nausea or vomiting, and fever, together with findings like localized tenderness, guarding, and rebound tenderness, help raise suspicion for appendicitis but are not always sufficiently specific when used alone. Pediatric patients, especially younger children, may have difficulty localizing pain or describing symptom progression, which can reduce the reliability of clinical judgment in the early stage of disease. This diagnostic uncertainty has encouraged the development of appendicitis pathways and scoring systems that standardize assessment and guide decisions regarding observation, imaging, and surgical referral. Over the last several years, there has been a clear shift toward imaging strategies that prioritize ultrasound as the first-line modality in children with suspected appendicitis. This approach is favored because ultrasound is noninvasive, does not expose children to ionizing radiation, is relatively inexpensive, and can be performed repeatedly if needed. In addition, modern appendicitis pathways have shown that the combination of clinical risk stratification and ultrasound can reduce dependence on computed tomography without adversely affecting clinical outcomes. Such an approach is particularly valuable in pediatric practice, where radiation avoidance is an important principle and the need for safe, reproducible diagnostic methods is especially high.[2] Ultrasonography plays a central role in the diagnosis of pediatric appendicitis because it can identify both direct and indirect signs of appendiceal inflammation. The principal sonographic features include visualization of a blind-ending, non-compressible tubular structure in the right iliac fossa, appendiceal diameter greater than 6 mm, mural thickening, and the presence of an appendicolith. Secondary signs such as periappendiceal fluid, echogenic inflamed periappendiceal fat, hyperemia on color Doppler, and localized abscess may further support the diagnosis, especially in cases where the appendix is difficult to visualize completely. More recent work has suggested that ultrasound criteria may continue to evolve, with some studies indicating that appendiceal diameter thresholds and combinations of sonographic signs may improve discrimination between uncomplicated and complicated appendicitis.[3,4] Despite its advantages, ultrasound is not without limitations. Its diagnostic performance may vary according to operator expertise, patient body habitus, bowel gas, the position of the appendix, and the stage of the disease process. Some children have equivocal or nondiagnostic scans, and others may have secondary inflammatory changes even when the appendix itself is not well seen. Nevertheless, recent pediatric studies continue to demonstrate good diagnostic performance for ultrasound in suspected appendicitis, including acceptable sensitivity and specificity in emergency department settings, as well as encouraging results for point-of-care ultrasound when performed by trained clinicians. These observations support the growing role of ultrasound not only as a radiology-based test but also as a practical bedside tool in selected pediatric settings.[5] Clinical scoring systems have been developed to complement imaging and improve decision-making in children with suspected appendicitis. Scores such as the Pediatric Appendicitis Score incorporate symptoms, signs, and laboratory variables into a structured framework that helps categorize patients into low-, intermediate-, or high-risk groups. However, a clinical score alone may not always provide sufficient certainty for operative decision-making, particularly in children with intermediate-risk presentation. This has led to increasing interest in combined models that integrate clinical scoring with ultrasound findings. Recent studies suggest that the use of appendicitis scoring together with ultrasound can improve overall diagnostic confidence and may be particularly useful in distinguishing uncomplicated from complicated appendicitis or in reducing unnecessary further imaging.[6]

MATERIAL AND METHODS

This prospective observational study was conducted at a tertiary care hospital among pediatric patients presenting with right iliac fossa pain and clinically suspected acute appendicitis. A total of 74 children were included in the study. The objective was to evaluate the utility of an ultrasound-based appendicitis scoring system in diagnosing acute appendicitis and to correlate the sonographic scoring findings with surgical and histopathological outcomes.

The study population comprised children who presented to the pediatric surgery/emergency department with right iliac fossa pain and were

referred for ultrasonographic evaluation for suspected appendicitis. Pediatric patients of either sex who were clinically stable and whose parents or guardians provided informed consent were included. Children with previous appendicectomy, known inflammatory bowel disease, appendicular mass or abscess already diagnosed on prior imaging, generalized peritonitis requiring immediate surgery without imaging correlation, traumatic abdominal pain, or inadequate clinical/imaging data were excluded from the study.

A detailed clinical assessment was performed in all enrolled patients at the time of admission. Demographic data including age and sex were recorded. Relevant clinical parameters such as duration and migration of pain, fever, vomiting, anorexia, tenderness in the right iliac fossa, rebound tenderness, guarding, and other associated symptoms were documented using a structured proforma. Laboratory parameters including total leukocyte count, differential leukocyte count, and other routinely available inflammatory markers, wherever available, were also noted to support clinicoradiological correlation.

All patients underwent abdominal ultrasonography using high-resolution grayscale ultrasound with graded compression technique, with additional color Doppler evaluation wherever required. The examination was performed by a qualified radiologist/sonologist using a high-frequency linear transducer, with supplementary curvilinear transducer assessment when necessary depending on body habitus and bowel gas pattern. The appendix was evaluated for visualization, location, compressibility, maximal outer diameter, wall thickness, luminal distension, presence of appendicolith, periappendiceal fat stranding or echogenicity, periappendiceal fluid collection, local abscess formation, bowel wall changes, and increased vascularity on Doppler examination. Associated secondary signs suggestive of appendicitis were carefully assessed and recorded.

An ultrasound-based appendicitis scoring system was applied to each patient based on predefined sonographic variables. The scoring parameters included appendiceal diameter greater than 6 mm, non-compressible blind-ending tubular structure in the right iliac fossa, mural thickening, presence of appendicolith, periappendiceal inflammatory changes, periappendiceal fluid collection, increased vascularity on color Doppler, and other relevant secondary signs of appendiceal inflammation. Based on the cumulative score, patients were categorized into different probability groups for appendicitis, and these findings were subsequently correlated with operative findings and histopathological diagnosis wherever surgery was performed.

The decision for surgical intervention was made by the treating surgical team on the basis of combined clinical, laboratory, and imaging findings, independent of the study analysis. In patients who underwent appendicectomy, intraoperative findings such as inflamed appendix, gangrenous appendix, perforation, appendicular lump, or alternative diagnosis were documented. Resected appendices were sent for histopathological examination, and the histopathology report was considered the reference standard for confirmation of appendicitis in operated cases. Histopathological findings were categorized as acute appendicitis, suppurative appendicitis, gangrenous appendicitis, perforated appendicitis, lymphoid hyperplasia, or normal appendix, as applicable.

For non-operated patients, clinical follow-up and final discharge diagnosis were used to determine the probable outcome where relevant. Correlation analysis was performed between ultrasound-based appendicitis score, operative findings, and histopathology results to determine the diagnostic performance of the scoring system. The primary outcome measure was the accuracy of the ultrasound-based appendicitis scoring system in diagnosing acute appendicitis. Secondary outcome measures included sensitivity, specificity, positive predictive value, negative predictive value, and overall diagnostic accuracy of the ultrasound score in relation to surgical and histopathological outcomes.

All collected data were entered into a standardized database and analyzed using Statistical Package for the Social Sciences (SPSS) software version 27.0. Quantitative variables were expressed as mean and standard deviation or median and interquartile range depending on data distribution, while qualitative variables were presented as frequency and percentage. Association between categorical variables was assessed using the chi-square test or Fisher's exact test, as appropriate. Comparison of continuous variables between groups was performed using the independent samples t-test or Mann–Whitney U test based on normality assumptions. Diagnostic validity parameters including sensitivity, specificity, positive predictive value, negative predictive value, and accuracy were calculated. Agreement between ultrasound-based scoring and histopathological outcome was assessed where applicable. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 74 pediatric patients presenting with right iliac fossa pain and clinically suspected acute appendicitis were evaluated using an ultrasound-based appendicitis scoring system.

[Table 1] presents the demographic and baseline characteristics of the study population. The majority of patients belonged to the 9–12 years age group (41.89%), followed by 13–16 years (36.49%), while 21.62% of patients were between 5–8 years of age. The mean age of the patients was approximately 11 years, indicating that appendicitis was more frequently observed in older children within the pediatric age group. In terms of gender distribution,

males constituted 56.76% (n = 42) of the study population, while females accounted for 43.24% (n = 32), showing a slight male predominance. With regard to duration of abdominal pain prior to presentation, the highest proportion of patients (41.89%) presented within 24–48 hours of onset of symptoms, followed by 39.19% presenting within 24 hours, whereas 18.92% presented after more than 48 hours. Laboratory evaluation revealed that 71.62% of patients had elevated leukocyte counts (>10,000/mm³), while 28.38% had leukocyte counts within normal limits, suggesting that leukocytosis was a common laboratory finding among children with suspected appendicitis.

[Table 2] summarizes the clinical features observed among the study participants. As expected, right iliac fossa pain was present in all patients (100.00%), as it was a key inclusion criterion. Right iliac fossa tenderness was the most common physical examination finding, present in 82.43% of patients, and showed a statistically significant association with appendicitis (p = 0.003). Among the associated symptoms, anorexia was present in 62.16% of patients, making it the most frequent accompanying symptom, followed by vomiting in 55.41% and migration of pain in 51.35%. Other clinical signs included rebound tenderness (47.30%), guarding (43.24%), and fever (39.19%). Several of these clinical parameters demonstrated statistically significant associations with appendicitis, including migration of pain (p = 0.021), vomiting (p = 0.034), anorexia (p = 0.015), rebound tenderness (p = 0.028), guarding (p = 0.041), and fever (p = 0.048).

[Table 3] shows the distribution of laboratory parameters among the study population. Elevated total leukocyte count (>10,000/mm³) was observed in 53 patients (71.62%), while 21 patients (28.38%) had normal leukocyte levels. This association was statistically significant (p = 0.002), indicating that leukocytosis is an important laboratory marker in suspected appendicitis. Similarly, neutrophilia (>70%) was present in 48 patients (64.86%), while 35.14% had neutrophil counts of ≤70%, and this difference was also statistically significant (p = 0.006). When leukocytosis and neutrophilia were considered together, 59.46% of patients demonstrated both findings, which showed a strong association with appendicitis (p = 0.004).

[Table 4] demonstrates the ultrasonographic findings observed in patients with suspected appendicitis. The most frequent ultrasound feature was appendiceal diameter greater than 6 mm, which was detected in 66.22% of patients, and showed a highly significant association with appendicitis (p = 0.001). Non-compressibility of the appendix was observed in 60.81% of patients (p = 0.003), further supporting the diagnosis of appendiceal inflammation. Mural wall thickening was noted in 50.00% of cases (p = 0.017). Additional secondary sonographic signs included periappendiceal fat stranding (45.95%), increased Doppler vascularity (41.89%), periappendiceal fluid collection (28.38%), and appendicolith (24.32%). These parameters also showed statistically significant associations with appendicitis. More advanced complications such as localized abscess formation were observed in 9.46% of patients, indicating cases of complicated appendicitis.

[Table 5] presents the correlation between ultrasound-based appendicitis scoring and the final surgical and histopathological outcomes. Among the 74 patients, histopathological examination confirmed appendicitis in 54 patients (72.97%), while 20 patients (27.03%) had a normal appendix or alternative diagnosis. In the low-probability ultrasound score group, only 4 patients (5.41%) were confirmed to have appendicitis, while 9 patients (12.16%) had normal findings. In the intermediate probability group, 12 patients (16.22%) had confirmed appendicitis and 5 patients (6.76%) had a normal appendix. The high-probability score group showed the strongest correlation with disease, where 38 patients (51.35%) had confirmed appendicitis and only 6 patients (8.11%) had normal histopathology. Statistical analysis revealed a highly significant association between ultrasound score and histopathological diagnosis (p = 0.001), indicating that higher ultrasound scores were strongly predictive of true appendicitis.

[Table 6] summarizes the diagnostic performance of the ultrasound-based appendicitis scoring system in the study population. The scoring system demonstrated a sensitivity of 87.04%, indicating that it correctly identified a large proportion of patients with true appendicitis. The specificity was 70.00%, reflecting a moderate ability to correctly identify patients without the disease. The positive predictive value (PPV) was 88.68%, suggesting that patients with a positive ultrasound score were highly likely to have appendicitis. The negative predictive value (NPV) was 66.67%, indicating that a negative ultrasound score reduced the probability of appendicitis but did not completely exclude it. The overall diagnostic accuracy of the ultrasound-based scoring system was 82.43%, demonstrating that this scoring approach is a reliable and effective diagnostic tool for evaluating pediatric patients with right iliac fossa pain.

Table 1: Demographic and Baseline Characteristics of Study Population (n = 74)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
5–8 years	16	21.62
9–12 years	31	41.89
13–16 years	27	36.49
Gender		
Male	42	56.76

Female	32	43.24
Duration of Pain		
<24 hours	29	39.19
24–48 hours	31	41.89
>48 hours	14	18.92
Leukocyte Count		
≤10,000 /mm³	21	28.38
>10,000 /mm³	53	71.62

Table 2: Clinical Features Observed in Study Population.

Clinical Parameter	Present n (%)	Absent n (%)	p-value
Right iliac fossa pain	74 (100.00)	0 (0.00)	—
Migration of pain	38 (51.35)	36 (48.65)	0.021
Fever	29 (39.19)	45 (60.81)	0.048
Vomiting	41 (55.41)	33 (44.59)	0.034
Anorexia	46 (62.16)	28 (37.84)	0.015
Rebound tenderness	35 (47.30)	39 (52.70)	0.028
Guarding	32 (43.24)	42 (56.76)	0.041
Right iliac fossa tenderness	61 (82.43)	13 (17.57)	0.003

Table 3: Laboratory Parameters in Suspected Appendicitis

Laboratory Parameter	Frequency (n)	Percentage (%)	p-value
Total Leukocyte Count			
≤10,000 /mm³	21	28.38	
>10,000 /mm³	53	71.62	0.002
Neutrophil Percentage			
≤70%	26	35.14	
>70%	48	64.86	0.006
Combined Leukocytosis + Neutrophilia			
Present	44	59.46	0.004
Absent	30	40.54	

Table 4: Ultrasonographic Findings in Patients with Suspected Appendicitis (n = 74)

Ultrasound Finding	Present n (%)	Absent n (%)	p-value
Appendix diameter >6 mm	49 (66.22)	25 (33.78)	0.001
Non-compressible appendix	45 (60.81)	29 (39.19)	0.003
Mural wall thickening	37 (50.00)	37 (50.00)	0.017
Appendicolith	18 (24.32)	56 (75.68)	0.042
Periappendiceal fat stranding	34 (45.95)	40 (54.05)	0.009
Periappendiceal fluid collection	21 (28.38)	53 (71.62)	0.028
Localized abscess	7 (9.46)	67 (90.54)	0.031
Increased Doppler vascularity	31 (41.89)	43 (58.11)	0.012

Table 5: Correlation of Ultrasound-Based Appendicitis Score with Surgical and Histopathological Outcome

Ultrasound Score Category	Confirmed Appendicitis n (%)	Normal Appendix n (%)	Total	p-value
Low probability	4 (5.41)	9 (12.16)	13	
Intermediate probability	12 (16.22)	5 (6.76)	17	
High probability	38 (51.35)	6 (8.11)	44	
Total	54 (72.97)	20 (27.03)	74	0.001

Table 6: Diagnostic Performance of Ultrasound-Based Appendicitis Scoring System

Diagnostic Parameter	Value (%)
Sensitivity	87.04
Specificity	70.00
Positive Predictive Value (PPV)	88.68
Negative Predictive Value (NPV)	66.67
Diagnostic Accuracy	82.43

DISCUSSION

In the present study, the mean age was approximately 11.28 years, with the largest proportion of children belonging to the 9–12-year age group (41.89%), followed by 13–16 years (36.49%), and there was a slight male predominance (56.76%). This age pattern is comparable to that reported by Mittal et al. (2013), in whose multicenter pediatric cohort the mean age was 11.0±3.7 years. Our findings therefore support the known tendency for appendicitis to occur more commonly in older children and early adolescents. The male predominance observed in our study is also in agreement with the general epidemiological pattern of pediatric appendicitis described in the literature, although the magnitude may vary between populations. In the present study, 41.89% of children presented within 24–48 hours of pain onset, suggesting that most cases were evaluated during the

active inflammatory stage rather than very early presentation.[7]

The clinical symptom profile in our series demonstrated right iliac fossa pain in all patients (100.00%), anorexia in 62.16%, vomiting in 55.41%, fever in 39.19%, and migration of pain in 51.35%. These findings are broadly comparable to the results of Song et al. (2018), who reported abdominal pain in 97.00%, vomiting in 71.30%, anorexia in 52.50%, and fever in 47.50% of children with appendicitis. Compared with their data, our patients had slightly lower frequencies of vomiting and fever but a somewhat higher proportion of anorexia. This variation may be attributable to differences in age structure, timing of presentation, and symptom recognition. Nevertheless, both studies indicate that anorexia, vomiting, and migratory pain remain important clinical clues in pediatric appendicitis and should be considered collectively rather than individually.[8]

On physical examination, right iliac fossa tenderness was present in 82.43% of our patients, rebound tenderness in 47.30%, and guarding in 43.24%, all of which showed significant association with appendicitis. These observations are supported by Dadeh et al. (2021), who found right lower quadrant tenderness to be one of the strongest predictors of appendicitis, with an odds ratio of 21.07, while signs of peritoneal irritation were also strongly predictive, with an odds ratio of 12.57. In the present study, the very high frequency of localized tenderness further emphasizes that physical examination retains substantial diagnostic value even when imaging is available. The comparatively lower frequency of rebound tenderness and guarding in our study may indicate that a proportion of patients were assessed before development of advanced peritoneal irritation.[9]

Laboratory evaluation in the current study showed leukocytosis in 71.62% of children, which was significantly associated with appendicitis (p=0.002). This is very similar to the findings of Wang et al. (2007), who reported that elevated white blood cell count in children aged 4–11.9 years had a sensitivity of 71.00% and specificity of 72.00% for appendicitis. Our results therefore reinforce the role of leukocytosis as an important supportive laboratory marker. However, as also emphasized by Wang et al., leukocyte count alone is insufficient for definitive diagnosis, because normal counts may still be present in a subset of affected children. Thus, in our cohort, leukocytosis served as a useful adjunct to clinical and sonographic assessment rather than a standalone diagnostic criterion.[10]

Neutrophilia greater than 70% was observed in 64.86% of our patients, while the combined presence of leukocytosis and neutrophilia was noted in 59.46%, both showing significant association with appendicitis. These findings correspond with the inflammatory response pattern reported by Yazici et al. (2010), who demonstrated that a neutrophil/lymphocyte ratio greater than 3.5 was present in 90.20% of children with appendicitis compared with 12.30% of those with nonspecific abdominal pain. Although our study did not specifically calculate the neutrophil/lymphocyte ratio, the significant frequency of neutrophilia in our series supports the same concept that neutrophil-predominant inflammation is strongly associated with acute appendicitis. The somewhat lower percentages in our study may be explained by the inclusion of all clinically suspected cases rather than exclusively confirmed appendicitis.[11]

Fever was present in 39.19% of children in the current study and, despite statistical significance, occurred less frequently than leukocytosis or local abdominal tenderness. This observation is in line with the report by Ha et al. (2012), who concluded that fever was less helpful than leukocytosis and left shift in distinguishing appendicitis from non-appendicitis among children presenting to the emergency department with abdominal pain. Our data similarly suggest that fever has supportive but limited independent diagnostic value. Therefore, absence of fever should not reduce clinical suspicion in a child with characteristic abdominal findings and suggestive ultrasound features.[12]

Among ultrasonographic findings in our study, appendiceal diameter greater than 6 mm was the most common primary sign, present in 66.22% of patients, followed by non-compressibility in 60.81% and mural wall thickening in 50.00%. These findings are comparable to those of Goldin et al. (2011), who showed that revised ultrasound criteria based on maximal outer diameter and wall thickness improved diagnostic accuracy, with sensitivity of 98.70% and specificity of 95.40% when optimized thresholds were used. Although our study used the conventional >6 mm criterion and reported prevalence of findings rather than criterion-specific predictive performance, the same structural sonographic abnormalities emerged as the most important indicators of appendicitis. This confirms that appendiceal enlargement and loss of compressibility remain the foundation of ultrasound diagnosis in children.[13]

Secondary sonographic signs in our study included periappendiceal fat stranding in 45.95%, increased Doppler vascularity in 41.89%, periappendiceal fluid collection in 28.38%, appendicolith in 24.32%, and localized abscess in 9.46%. These findings highlight the additional value of secondary inflammatory changes, especially in more advanced disease. Kelly et al. (2019) reported that ultrasound had an overall sensitivity of 72.55% and specificity of 77.01% in clinically ambiguous pediatric appendicitis, and also emphasized that even when the appendix was not visualized, secondary signs were useful in risk assessment. Compared with that study, the significant presence of secondary signs in our series supports their contribution in strengthening diagnostic confidence and in identifying complicated appendicitis, particularly in cases where primary appendiceal visualization may be limited.[14]

Histopathological confirmation of appendicitis was obtained in 54 of 74 patients (72.97%) in our study, whereas 20 patients (27.03%) had a normal appendix or alternative diagnosis. When stratified by ultrasound score, confirmed appendicitis was present in 30.77% of the low-probability group, 70.59% of the intermediate-probability group, and 86.36% of the high-probability group, with a highly significant overall association (p=0.001). This graded rise in disease confirmation is comparable to the prospective validation of the Pediatric Appendicitis Score by Goldman et al. (2008), who showed that low scores were mostly associated with absence of appendicitis while high scores strongly favored true disease. Our findings similarly indicate that higher ultrasound-based scores are strongly predictive of histopathologically proven appendicitis, whereas intermediate scores require careful clinical and imaging integration.[15]

The diagnostic performance of the ultrasound-based scoring system in the present study was good, with sensitivity of 87.04%, specificity of 70.00%, positive predictive value of 88.68%, negative predictive value of 66.67%, and overall diagnostic accuracy of 82.43%. These values compare favorably with the study by Crady et al. (1993), who reported sensitivity of 85.00% and specificity of 94.00% for ultrasound in children with suspected appendicitis. Our sensitivity was slightly higher, suggesting that the scoring system was effective in identifying true cases, whereas specificity was lower, indicating a greater false-positive rate compared with their series. This difference may reflect broader inclusion of equivocal cases, scoring-based interpretation, and operator-related variability. Even so, both studies support ultrasound as an effective and practical first-line imaging modality in pediatric right iliac fossa pain.[16]

CONCLUSION

The present study showed that an ultrasound-based appendicitis scoring system is a useful and reliable tool in children presenting with right iliac fossa pain. The scoring system demonstrated good sensitivity, positive predictive value, and overall diagnostic accuracy, with significant correlation with surgical and histopathological outcomes. Sonographic parameters such as appendiceal diameter >6 mm, non-compressibility, mural thickening, and periappendiceal inflammatory changes were strongly associated with confirmed appendicitis. Thus, ultrasound-based scoring can support early diagnosis, improve clinical decision-making, and help reduce unnecessary surgery in pediatric patients.

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