Demographic Profile and Diagnostic Accuracy of the Pediatric Appendicitis Score in Children: A Retrospective Observational Study in A Tertiary Pediatric Intensive Care Unit

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ABSTRACT

Background*: Acute appendicitis is a frequent cause of emergency surgery in children, but diagnosis can be challenging due to nonspecific clinical presentations, particularly in younger age groups. Therefore, this study aimed to describe the demographic characteristics of pediatric patients with suspected appendicitis, evaluate the diagnostic utility of the Pediatric Appendicitis Score (PAS), and the duration of postoperative care in the pediatric intensive care unit (PICU).*

Methods*: This retrospective cross-sectional observational study included 15 pediatric patients with an acute abdomen who underwent exploratory laparotomy. PAS was applied, with histopathology as the reference standard, and postoperative PICU admission was performed for all patients. The variables collected were demographic data, PAS, histopathology results, and PICU length of stay. Diagnostic performance was also evaluated using sensitivity, specificity, predictive values, diagnostic accuracy, and area under the curve (AUC).*

Results*: The results showed that histopathologically confirmed appendicitis was more common in older children and was associated with a higher mean. Using a cutoff value ≥6, PAS showed a sensitivity of 55.6% and specificity of 83.3%, while receiver operating characteristic analysis obtained moderate discriminative ability (AUC 0.704). Postoperative PICU length of stay tended to be shorter in confirmed cases, without statistical significance (p = 0.475).*

Conclusion*: Pediatric appendicitis in the tertiary center predominantly affected children aged 5–18 years. The PAS showed moderate diagnostic accuracy, with good specificity but limited sensitivity. Although confirmed cases also tended to have shorter PICU stays, further studies comprising larger patient populations should be carried out to confirm and strengthen these results.*

Keywords: *Appendicitis, Child, Diagnostic Accuracy, Pediatric Appendicitis Score, Pediatric Intensive Care Unit*

ABSTRAK

***Latar Belakang**: Apendisitis akut masih merupakan penyebab tersering tindakan pembedahan darurat pada anak. Namun, penegakan diagnosis sering kali sulit, terutama pada kelompok usia yang lebih muda, akibat gambaran klinis yang tidak khas. Penelitian ini bertujuan untuk menggambarkan karakteristik demografis pasien anak dengan kecurigaan apendisitis, menilai kinerja diagnostik Pediatric Appendicitis Score (PAS), serta mengevaluasi durasi perawatan pascaoperasi di unit perawatan intensif anak.*

***Metode**: Penelitian observasional retrospektif potong lintang ini melibatkan 15 pasien anak dengan abdomen akut yang menjalani laparotomi eksploratif. PAS diterapkan dengan pemeriksaan histopatologi sebagai standar baku. Seluruh pasien menjalani perawatan di PICU pascaoperasi. Variabel yang dikumpulkan meliputi data demografis, skor PAS, hasil histopatologi, dan lama rawat PICU. Kinerja diagnostik PAS dievaluasi menggunakan sensitivitas, spesifisitas, nilai prediktif positif dan negatif, akurasi diagnostik, serta area under the curve (AUC).*

***Hasil**: Apendisitis yang terkonfirmasi secara histopatologis lebih sering ditemukan pada anak usia lebih tua. Rerata skor PAS lebih tinggi pada kasus terkonfirmasi. Dengan nilai batas ≥6, PAS menunjukkan sensitivitas 55,6% dan spesifisitas 83,3%. Analisis kurva receiver operating characteristic menunjukkan kemampuan diskriminasi sedang (AUC 0,704). Lama rawat pascaoperasi di unit perawatan intensif anak cenderung lebih singkat pada kasus terkonfirmasi.*

***Kesimpulan**: Apendisitis pediatrik di pusat rujukan tersier ini terutama terjadi pada anak usia 5–18 tahun. PAS menunjukkan akurasi diagnostik sedang dengan spesifisitas baik namun sensitivitas terbatas. Kasus terkonfirmasi cenderung memiliki lama rawat PICU yang lebih singkat. Diperlukan penelitian dengan jumlah subjek yang lebih besar untuk memvalidasi temuan ini.*

***Kata kunci:** Akurasi Diagnostik, Anak, Apendisitis, Pediatric Appendicitis Score, Pediatric Intensive Care Unit*

INTRODUCTION

Appendicitis is a frequently encountered source of abdominal complaints among pediatric patients, requiring prompt surgical intervention.[1] Despite being a well-established condition, the challenges associated with early diagnosis contribute to high rates of perforation and negative appendectomies, particularly with advancements in imaging and laboratory tests.[2] Appendicitis has shown a rising trend among children worldwide. In 2021, pediatric cases contributed to approximately 12.93% of newly diagnosed appendicitis cases globally, with an estimated incidence of 109 per 100,000 children. Since 1990, the incidence has increased at an average rate of 0.3% per year, with substantial regional variation influenced by sociodemographic characteristics.[3] Although rare in younger children, the incidence rises after birth and peaks in adolescence, with variation across sex, race, and socioeconomic status. Various clinical scoring systems have been introduced to enhance diagnostic precision and minimize the risk of unnecessary surgical interventions in suspected appendicitis. Among these systems, the Pediatric Appendicitis Score (PAS) is often used due to simplicity and ease of application. Despite these advantages, PAS has not been universally adopted in routine pediatric care, and the diagnostic reliability continues to be debated.[2,4,5]

Management of appendicitis has gained significant improvement over time. Currently, laparoscopic appendectomy is widely recognized as the standard, replacing the open method due to better recovery and fewer complications. In complicated cases, surgery is often combined with postoperative antibiotics, and immediate procedure is no longer required.[6] Although nonoperative treatment with antibiotics has been considered, particularly for uncomplicated cases, it is not routinely used in children due to higher failure rates and longer hospital stays. Therefore, surgical removal remains the preferred treatment in pediatric patients. Postoperative outcomes following uncomplicated appendectomy in children are generally favorable, with a short average hospital stay.[7] Despite the variability in incidence, postoperative complications still pose a significant clinical concern, particularly in complex cases.[6] This shows the need to evaluate both the accuracy of diagnostic tools such as PAS and postoperative outcomes to improve care quality and resource efficiency. Compared to most previous experiments conducted in emergency or outpatient settings, this study shows a specific institutional practice, where pediatric patients undergoing exploratory laparotomy for acute abdominal conditions are routinely admitted to the pediatric intensive care unit (PICU). Based on the literature, there is a limited

report on the diagnostic performance of the PAS within a PICU-based surgical cohort. Therefore, this study aims to provide insight into the performance of PAS in a highly selected pediatric population by characterizing patient demographics, determining the diagnostic accuracy, and analyzing postoperative length of stay (LOS) within the PICU.

METHODS

Study Design and Setting

A retrospective observational study with a cross-sectional design was carried out in the PICU of Murni Teguh Memorial Hospital, a tertiary referral hospital located in Medan, Indonesia. Data collection was conducted from January 2024 through February 2025. Ethical clearance was granted by the institutional ethics review board of the Faculty of Medicine, Universitas Sumatera Utara (Reference No. 1165/KEPK/USU/2024). This study served as a sub-analysis of a larger ethically approved study protocol titled "Studi Epidemiologi dan Hasil Perawatan Intensif Pediatrik," within which the pediatric appendicitis cases were included. All patient information was anonymized and managed confidentially in compliance with established ethical principles for clinical study.

Study Population

All children who required admission to the PICU throughout the study timeframe for postoperative monitoring following exploratory laparotomy for acute abdominal pathology were included in the analysis. Eligibility criteria comprised patients aged from 1 month to 18 years who had undergone preoperative evaluation using the PAS and received exploratory laparotomy where appendicitis was considered among the differential diagnoses. The decision to perform an exploratory laparotomy was based on the attending surgeon's clinical judgment, integrating clinical data, laboratory results, and imaging when available, rather than depending only on the PAS. Therefore, patients with PAS values below the conventional cutoff could still undergo surgical intervention when clinical suspicion remained high. Imaging studies, such as abdominal ultrasound, could be performed as part of routine clinical evaluation, although these data were not consistently available and were not included in the present analysis. Histopathological examination of the surgical specimen was used to confirm or rule out the diagnosis of appendicitis. Appendicitis diagnosis was established based on intraoperative results and histopathological examination. The included cases comprised both uncomplicated (acute) and complicated appendicitis, such as perforated, as reported in intraoperative and histopathological results. However, due to the limited sample size and the exploratory nature of the study, further subclassification into uncomplicated and complicated appendicitis was not performed in the analysis.

The sample consisted of the entire cohort of eligible pediatric patients presenting with acute abdominal conditions who underwent exploratory laparotomy and required postoperative admission to the PICU over the predetermined observation interval. All consecutive patients fulfilling the inclusion criteria were enrolled using a total sampling method to obtain 15 cases. There was no formal sample size estimation because this study used a retrospective design and was intended primarily for exploratory analysis. The sample size represented all consecutive eligible pediatric patients who met the inclusion criteria during the predefined study period. The relatively small number of cases showed the specific clinical setting, as only postoperative patients requiring PICU admission following exploratory laparotomy for acute abdomen were included. Based on the included sample, the study population represented a surgically managed cohort of pediatric patients with acute abdominal conditions. Patients undergoing routine appendectomy without PICU admission were not captured in this dataset and were not included in the analysis.

Data Collection

Demographic profiles and clinical data were retrospectively retrieved from institutional electronic health records, comprising patient age, biological sex, nutritional classification, preoperative PAS, histopathological results, and duration of postoperative stay in the PICU. Nutritional status was determined based on anthropometric measurements recorded in the medical records. For children under 5 years of age, classification was based on World Health Organization (WHO) growth standards. Meanwhile, children aged over 5 years used the Centers for Disease Control and Prevention (CDC) growth charts. Nutritional status was categorized into overnourished, well-nourished, mild malnutrition, and severe malnutrition according to standard pediatric classifications. The PAS was recorded before surgery as part of the routine diagnostic evaluation. Definitive confirmation or exclusion of appendicitis was established through histopathological

evaluation of the resected appendix specimen. All included patients underwent exploratory laparotomy and were admitted to the PICU for postoperative monitoring.

Due to the retrospective study design, PAS components were derived from documented clinical and laboratory results in the medical records. However, clinical features that were not explicitly recorded were considered absent. This method could introduce information bias related to incomplete documentation or variability in clinical assessment at presentation. To minimize the risk of diagnostic misclassification, the analysis was restricted to cases with clearly recorded clinical signs and objectively measurable laboratory results, with histopathological examination designated as the diagnostic gold standard. This study did not perform statistical imputation, and there were no missing data for the main study variables, including age, sex, PAS total score, histopathological results, and PICU LOS.

Outcome Measures

Primary study outcomes included patient demographic characteristics and relevant clinical variables, including age, sex, nutritional status, preoperative PAS, and length of postoperative admission in the PICU. The diagnostic performance of PAS was evaluated using histopathological results as the reference standard.

The PAS serves as a composite clinical scoring system consisting of eight components. These included migration of abdominal pain, anorexia, nausea and/or vomiting, fever exceeding 38°C, right lower quadrant tenderness, pain provoked by coughing, percussion, or hopping, leukocytosis greater than 10,000 cells/mm³, and neutrophil predominance exceeding 7,500 cells/mm³, as defined in the original PAS described by Samuel et al.[8] Right lower quadrant tenderness and leukocytosis were assigned a score of 2 points each, while the remaining parameters were given 1 point each, leading to a total score ranging from 0 to 10. A cutoff value of ≥6 was used based on previous validation studies, showing that the threshold was associated with a higher probability of appendicitis and commonly applied in clinical practice.[8] In clinical practice, lower PAS values suggested a low probability of appendicitis, while higher scores showed an increased likelihood and could support the need for further diagnostic evaluation or surgical consideration based on the overall clinical context.

Statistical Analysis

All statistical procedures were conducted with IBM SPSS Statistics version 24 (IBM Corp., Armonk, NY, USA). The distributional characteristics of continuous data were examined using the Shapiro–Wilk test in consideration of the limited sample size. Continuous variables were reported using mean and standard deviation or median and interquartile range, depending on data distribution. Meanwhile, categorical variables were expressed as frequencies and proportions. Between-group comparisons were carried out using parametric or nonparametric tests for continuous data, as appropriate, and the chi-square or Fisher's exact test for categorical variables.

The diagnostic capability of the PAS was evaluated by comparing score results with histopathological results as the reference standard. Receiver operating characteristic (ROC) analysis was used to quantify overall discriminative performance, and diagnostic accuracy indices were calculated using a predefined cutoff value of 6 or higher.[8] Due to the limited sample size, this analysis was considered exploratory, and the results should be interpreted with caution. There were no adjustments for sampling design because all eligible patients within the study period were enrolled using a consecutive sampling method. Furthermore, no subgroup analyses, interaction testing, or sensitivity assessments were planned or undertaken, as this study was exploratory in nature and included a limited sample size. A threshold for statistical significance was defined using a two-sided p-value of less than 0.05.

RESULTS

Patient Characteristics

A total of 15 pediatric cases were included in the final analysis during the study period. All identified cases fulfilled the eligibility criteria and were included in the final analysis. Histopathological examination confirmed appendicitis in 9 patients, while 6 had non-appendicitis results. Patients with appendicitis were significantly older than those without appendicitis (10 ± 4.9 vs. 3.5 ± 4.3 months, $p = 0.045$). Female patients slightly predominated in the overall cohort (53.3%). There were no statistically meaningful differences observed in nutritional status across the comparison groups. The mean PAS was numerically greater among patients with confirmed appendicitis than among the non-appendicitis group (6.1 ± 1.7 vs. 4.5 ±

Table 1. Baseline Demographic and Clinical Characteristics of the Study Population

Variable	All patients (n=15)	Appendicitis (n=9)	Non-Appendicitis (n=6)	p-value
Age (Years), Mean ± SD	7.4 ± 5.6	10 ± 4.9	3.5 ± 4.3	***0.045**
Age group, n (%)				
0 – 1	2(13.4)	0 (0)	2 (33.3)	0.083
1 – 5	5(33.3)	2 (22.2)	3 (50.0)	
5 – 12	5(33.3)	4 (44.4)	1 (16.7)	
12 – 18	3(20.0)	3 (33.4)	0 (0)	
Sex, n (%)				0.608
Male	7(46.7)	5(55.6)	2(33.3)	
Female	8(53.3)	4(44.4)	4(66.7)	
Nutritional Status, n(%)				0.582
Severe Malnutrition	3(20.0)	1 (11.1)	2 (33.3)	
Mild Malnutrition	1(6.7)	1 (11.1)	0 (0)	
Well-nourished	7(46.7)	4 (44.4)	3 (50.0)	
Over-nourished	4(26.7)	3 (33.4)	1 (16.7)	
PAS, Mean ± SD	5.2 ± 1.8	6.1 ± 1.7	4.5 ± 1.9	0.187
PAS ≥ 6 (n, %)	5 (33.3)	4 (44.4)	1 (16.7)	0.580
PICU Length of stay (days), Mean ± SD	5 ± 3.9	3.7 ± 1.92	6.8 ± 5.5	0.475

Note: Values are presented as mean ± standard deviation (SD) or number (percentage); PAS = Pediatric Appendicitis Score; PICU = Pediatric Intensive Care Unit; Statistical significance was defined as $p < 0.05$; Comparisons were performed using Mann–Whitney U test for continuous variables and Fisher's exact test for categorical variables; Continuous variables are presented as mean ± SD for descriptive purposes; Significant p-values are showed with an asterisk (*).

1.9), although the observed difference failed to meet criteria for statistical significance ($p = 0.187$). Among the PAS components, right lower quadrant tenderness, leukocytosis, and gastrointestinal symptoms such as nausea or vomiting were among the most frequently observed results. In comparison, migration of pain and fever was less consistently documented, while neutrophil predominance was variably present across the study population. The mean LOS tended to be longer in the non-appendicitis group (6.8 ± 5.5 vs. 3.7 ± 1.9 days), but this variation did not show statistical significance ($p = 0.475$). The baseline demographic and clinical characteristics of the study population are summarized in **Table 1.** These include age distribution, sex, nutritional status, PAS, and LOS.

Predictive Performance of the PAS

The association between PAS categories and histopathological results is shown in **Table 2.** Using a cutoff value ≥6, PAS showed moderate sensitivity (55.6%) and higher specificity (83.3%) for histopathologically confirmed appendicitis. The overall accuracy of the score for identifying appendicitis within this study population was calculated at 66.7%. Among the PAS components, leukocytosis and fever were the most frequently observed results, each present in 13 out of 15 patients (86.7%). Neutrophil predominance was also commonly observed in 12 patients (80.0%). Right lower quadrant tenderness was identified in 9 patients (60.0%), while nausea and/or vomiting were present in 8 (53.3%). In comparison, anorexia was less frequently documented (2 patients, 13.3%), and migration of pain was not observed in this cohort. Based on score categorization, 3 patients (20.0%) were classified as low probability (0–3), 8 (53.3%) as intermediate probability (4–6), and 4 (26.7%) as high probability (7–10) for appendicitis.

Table 2. Association Between PAS Categories and Histopathological Results.

	Histopathological (+)	Histopathological (-)	Total
PAS ≥ 6	5	1	6
PAS < 6	4	5	9
Total	**9**	**6**	**15**

Note: PAS = pediatric appendicitis score.

Additional assessment of the diagnostic capability of the PAS through ROC curve analysis is shown in **Table 3** and **Figure 1.** The analysis showed a moderate ability of the score to distinguish cases with histopathologically confirmed appendicitis from those without. However, the observed discriminatory performance did not reach statistical significance and should be interpreted with caution, as the small sample size limits the stability and reliability of the ROC estimates.

Table 3. Diagnostic Performance of PAS Based on ROC Analysis.

AUC	Std. Error	P value	95% CI (Lower – Upper)
0.704	0.152	0.195	0.405 – 1.000

Note: AUC = area under the curve; CI = confidence interval.

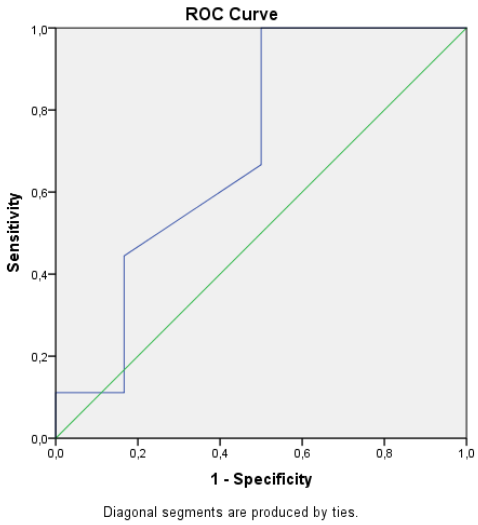

Figure 1. ROC Curve of PAS for Diagnosing Appendicitis

DISCUSSION

This study provides insight into the demographic characteristics, diagnostic performance of PAS, and postoperative outcomes of pediatric patients with suspected appendicitis treated in a tertiary PICU setting. The results showed that histopathologically confirmed appendicitis was more commonly observed in children aged ≥5 years. The PAS had moderate diagnostic accuracy with high specificity but limited sensitivity. Furthermore, confirmed appendicitis cases tended to have shorter postoperative PICU LOS compared with non-appendicitis cases. These results show both the usefulness and limitations of PAS in a small pediatric cohort, suggesting the application within a specific institutional setting where patients undergoing exploratory laparotomy are routinely admitted to the PICU, compared to general emergency-based studies.

Patients with histopathologically confirmed appendicitis in this cohort were significantly older than those without appendicitis (10 ± 4.9 vs. 3.5 ± 4.3 months, p = 0.045). This result is consistent with established epidemiological patterns, showing a progressive increase in appendicitis incidence with advancing pediatric age, while occurrence in young children and very young children remains uncommon. Aneiros et al. reported appendicitis rates of only 2.9% in young children and 13.4% in preschoolers, due to underdeveloped lymphoid tissue in early life.[9] Similar age differences were consistently reported, including by Dadeh et al., who observed median ages of 10 years in appendicitis cases and 4 years in non-appendicitis cases.[10] Furthermore, the same mean age distributions among pediatric patients diagnosed with appendicitis were reported by Ray et al. and Simkhada et al., as well as in a large multicenter investigation conducted by Trinidad et al. These results show that appendicitis predominantly affects older children.[11–13]

Within this cohort, sex distribution showed no significant statistical difference in sex distribution between children with and without appendicitis (p = 0.608). Although the overall cohort showed a relatively balanced sex distribution, previous studies consistently reported a male predominance in pediatric appendicitis. Ray et al. and Simkhada et al. identified male proportions of 66% and 92%, respectively,[11,12] while Aneiros et al. and Salö et al. indicated predominance in large pediatric surgical cohorts.[9,14] Aydoğdu et al. found a predominance of male patients, with a male-to-female ratio approximating 2.2:1, and reported higher negative appendectomy rates among females, potentially reflecting diagnostic challenges related to gynecological conditions.[15] Trinidad et al. also reported male predominance in 60.3% of cases.[13] However, the absence of a sex-related difference in this study is influenced by the limited sample size.

Nutritional status was not statistically associated with the occurrence of appendicitis in the analyzed population (p = 0.582). Children in both groups showed a wide range of nutritional statuses, with most confirmed appendicitis cases being well-nourished or over-nourished, while severe malnutrition was relatively more frequent in non-appendicitis cases. Although the role of nutritional status in pediatric appendicitis remained suboptimally defined, malnutrition could obscure inflammatory responses or delay presentation, while overnutrition contributed to diagnostic challenges. Currently, no published studies have specifically evaluated the impact of nutritional status on pediatric appendicitis risk or outcomes. These results provide preliminary observations, showing the need for further investigation.

The PAS showed moderate diagnostic performance in this study, with relatively high specificity but limited sensitivity. When the PAS threshold of 6 or greater was applied, the tool showed a sensitivity of 55.6% and a corresponding specificity of 83.3%. The area under the ROC curve (AUC) was 0.704, suggesting moderate discriminatory capacity. These results suggest that the ability to of PAS to eliminate the disease is limited, particularly in small and heterogeneous pediatric populations. Similarly, Salö et al. and Salö et al. described low sensitivity of PAS ≥6, particularly in younger children.[14,16] Raeisi et al. reported variable diagnostic performance based on patient characteristics

and cutoff values.[4] In comparison, larger validation studies have shown higher sensitivity at the expense of lower specificity, suggesting an inherent trade-off between case detection and false-positive rates.[2,17] Salahuddin et al. reported that despite high PPV at higher PAS cutoffs, NPV remained low, limiting further use for ruling out appendicitis.[1] According to Fujii et al., higher PAS values could be more useful for identifying disease severity rather than serving as a standalone diagnostic tool.[18] These results suggest that, in the specific clinical setting of pediatric patients with acute abdomen requiring surgical intervention and postoperative intensive care, the PAS plays a role as an adjunct to clinical judgment, rather than serving as a standalone diagnostic tool.

In cases where appendicitis was not confirmed histopathologically, alternative diagnoses in this cohort included intussusception, ileus obstruction, adhesive small bowel obstruction, and mesenteric lymphadenitis, which could present with overlapping symptoms such as abdominal pain and vomiting. Similar results have been reported in previous studies, where intussusception, mesenteric lymphadenitis, and various non-surgical etiologies, including gastroenteritis, enterocolitis, constipation, and other intra-abdominal pathologies, were frequently observed among children evaluated for suspected appendicitis.[8,19] The diversity of clinical presentation, particularly in younger children with limited ability to articulate their symptoms, complicates diagnosis and contributes to the sensitivity of scoring systems like the PAS. These observations show the need for cautious interpretation of PAS results and careful consideration of differential diagnoses in heterogeneous pediatric populations.

Several other scoring systems have been developed to assist in the diagnosis of appendicitis in children. The Alvarado score, one of the oldest and most widely used systems, has shown variable performance in pediatric populations, with studies reporting limited sensitivity and specificity. Furthermore, the Modified Pediatric Appendicitis Score (MPAS), which excludes laboratory parameters, has shown high sensitivity with very low specificity. Other pediatric-specific systems, such as the Lintula score, have indicated relatively higher specificity but lower sensitivity, suggesting a better ability to exclude appendicitis. The Tzanakis scoring system, which incorporates ultrasonography and laboratory results, showed high sensitivity and overall diagnostic accuracy, despite being initially developed for the adult population. Recently, newer systems such as the RIPASA and AIR scores have been introduced, with RIPASA designed specifically for Asian populations and AIR emphasizing inflammatory parameters.[2] These results show that each scoring system has inherent strengths and limitations. However, the accuracy is insufficient when used in isolation, supporting the role of PAS as an adjunct rather than a definitive diagnostic tool in pediatric appendicitis.

Patients with histopathologically confirmed appendicitis showed a trend toward shorter postoperative stays in the PICU, although this difference did not attain statistical significance. This trend can be related to more straightforward postoperative recovery in confirmed appendicitis cases, while patients without appendicitis require prolonged observation due to diagnostic uncertainty or alternative intra-abdominal pathology. Previous studies reported that LOS was influenced by disease severity and surgical method.[6,7,20] Existing literature has shown that laparoscopic appendectomy is associated with shorter hospitalization durations and lower postoperative complication rates when compared with conventional open surgical methods.[21] Patient-related factors such as obesity appear to have less impact on LOS than clinical and surgical variables.[22] These results suggest that LOS shows a combination of disease complexity, management strategy, and institutional practices.

Despite the significant contribution of this study, several methodological constraints should be acknowledged. The limited sample size substantially restricts statistical power, reduces the generalizability of the results, and limits the stability as well as reliability of the estimated AUC derived from ROC analysis. Furthermore, the retrospective design, single-center setting, and exclusive inclusion of postoperative PICU admissions may not fully capture the broader clinical spectrum of pediatric appendicitis, thereby limiting external validity. Patients undergoing routine appendectomy without PICU admission were not included in this study. This should be considered when interpreting the results due to the potential to limit generalizability and introduce potential selection bias. Reliance on medical records introduces potential information bias, and the surgical method and postoperative complications were not analyzed. Consequently, further larger-scale and multicenter prospective studies are recommended to corroborate these results as well as properly define the diagnostic and prognostic relevance of the PAS, including the potential influence of nutritional status and surgical modality.

The results of this study should be interpreted with an appropriate degree of caution. Despite showing moderate diagnostic accuracy with relatively high specificity, the limited sensitivity indicated that PAS alone could be insufficient for excluding appendicitis, particularly in small and heterogeneous pediatric cohorts. The observed outcomes are consistent with previous reports showing that the diagnostic accuracy of the PAS may vary across different pediatric age groups and clinical settings. Considering the retrospective nature of the study, the limited sample size, and the exploratory analyses undertaken, the conclusions should be regarded as hypothesis-generating rather than conclusive.

CONCLUSION

In conclusion, this study shows that pediatric appendicitis in a tertiary care setting, within a cohort of children undergoing exploratory laparotomy with routine PICU admission, predominantly affects children aged 5–18 years and remains a diagnostic challenge in younger age groups. Although the PAS shows good specificity, the limited sensitivity underscores the need for complementary diagnostic tools. Shorter postoperative stays among children with confirmed appendicitis suggest the benefit of early and accurate diagnosis. These results support the continued refinement of clinical scoring systems like PAS and emphasize the importance of integrating demographic and perioperative data to improve diagnostic accuracy and postoperative outcomes in pediatric appendicitis.

CONFLICT OF INTEREST

The authors state that no competing interests are associated with this study.

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None.

AUTHOR CONTRIBUTIONS

A and RFM were responsible for conceptualization and methodology, while A and DM handled data curation and investigation. A performed the formal analysis with input and validation from RFM and DM. RFM oversaw project administration, supervision, and funding acquisition, while DM and RFM provided necessary resources. Visualization was carried out by A and RFM. A drafted the original manuscript, and all authors (RFM, DM, A, and AK) contributed to reviewing and editing the final version. A was responsible for drafting the initial version of the manuscript. AK contributed to manuscript preparation and critical revision. All authors (RFM, DM, A, and AK) contributed to critical revision of the content and approved the final manuscript prior to submission.

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DATA AVAILABILITY

The datasets underpinning the results derived from this study were restricted from open access in accordance with institutional policies and ethical obligations related to patient privacy. Access to the underlying dataset can be granted by the corresponding author upon submission of a justified request.

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