



JSRR

Journal of Surgical Research & Reviews

www.internationalmedicalpublishing.com



Research Article

Section: Pediatrics

Diagnostic Performance & Prognostic Significance of Procalcitonin & C-Reactive Protein in Children with Abdominal Sepsis

Neeraj Sharma¹ & Sandhya Jain^{1*}

¹Department of Pediatrics, World College of Medical Sciences & Research & Hospital, Jhajjar, Haryana, India

HIGHLIGHTS

- PCT outperformed CRP
- Biomarkers correlated with severity
- PCT showed higher accuracy
- Severe sepsis increased mortality
- Biomarkers aided risk stratification

Key Words:

Pediatric abdominal sepsis
Procalcitonin
C-reactive protein
Bacterial infection
Sepsis severity
Biomarkers

ABSTRACT

Introduction: Abdominal sepsis in children may progress rapidly to organ dysfunction and adverse outcomes, making early recognition of bacterial infection essential. Procalcitonin (PCT) and C-reactive protein (CRP) are commonly used inflammatory biomarkers, but their comparative diagnostic and prognostic utility in pediatric abdominal sepsis requires further evaluation. **Aim & Objective:** To compare the diagnostic performance of procalcitonin (PCT) and C-reactive protein (CRP) and evaluate their association with sepsis severity and clinical outcomes in children with abdominal sepsis. **Material & Methods:** This cross-sectional analytical observational study included 100 children aged 5–12 years with abdominal sepsis. Serum PCT and CRP were measured along with appropriate microbiological investigations. Patients were categorized according to sepsis severity and followed for clinical outcomes. Diagnostic performance was assessed using sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), overall accuracy, and receiver operating characteristic analysis. **Results:** The mean age was 8.7 ± 2.2 years; 62% were boys. PCT demonstrated a sensitivity of 84.8%, specificity of 90.7%, PPV of 88.6%, NPV of 87.5%, and diagnostic accuracy of 88.0%. Corresponding values for CRP were 80.4%, 85.2%, 82.2%, 83.6%, and 83.0%, respectively. Median PCT increased from 1.30 ng/mL in mild sepsis to 15.55 ng/mL in severe sepsis, while CRP increased from 22.7 to 167.3 mg/L ($p < 0.001$ for both). Recovery decreased from 89.3% in mild to 26.7% in severe sepsis, while mortality reached 30.0% in severe cases ($p < 0.001$). **Conclusion:** PCT demonstrated better diagnostic performance than CRP in pediatric abdominal sepsis. Both biomarkers correlated with increasing disease severity and clinical outcome. Serial assessment may provide a useful adjunct to clinical and microbiological evaluation for diagnosis, risk stratification, and monitoring of children with abdominal sepsis.



* Corresponding Author: Sandhya Jain, e-mail: jainsandhya62@gmail.com

Article History: Received 28 August 2026; Received in Revised form 15 October 2026; Accepted 22 October 2026

How To Cite: Neeraj Sharma & Sandhya Jain. Diagnostic Performance & Prognostic Significance of Procalcitonin & C-Reactive Protein in Children with Abdominal Sepsis. *JSRR : Journal of Surgical Research & Reviews*. 2026;3(1):1-8.

This publication is licensed under CC-BY 4.0. Copyright © 2026 The Authors. Published by International Medical Publishing Group.

INTRODUCTION

Sepsis in children remains an important cause of preventable morbidity and mortality and is characterized by life-threatening organ dysfunction resulting from an abnormal host response to infection. Pediatric sepsis differs from adult sepsis in its physiological responses, age-dependent vital signs, disease spectrum, and patterns of organ dysfunction, making early recognition particularly challenging [1]. The recently developed Phoenix criteria further emphasize organ dysfunction in defining pediatric sepsis and provide age-specific parameters for children, including those aged 5-12 years [2].

Intra-abdominal infections are an important source of systemic infection in children. Complicated appendicitis, intestinal perforation, bowel obstruction with ischemia or perforation, intra-abdominal abscess, pancreatitis, and secondary peritonitis can progress rapidly to sepsis when infection is not recognized and controlled promptly [3]. Among these, acute appendicitis and its complications constitute an important cause of pediatric abdominal surgical emergencies [4]. Delay in diagnosis may result in perforation, peritonitis, abscess formation, systemic inflammatory response, and subsequent organ dysfunction [5].

Early identification of bacterial infection in children with acute abdominal conditions is often difficult because fever, tachycardia, leukocytosis, abdominal pain, and other inflammatory manifestations are not specific for bacterial sepsis. Although microbiological culture remains important for identifying causative organisms, results are not immediately available and cultures may remain negative despite clinically significant infection [6]. Current pediatric sepsis guidance therefore emphasizes timely clinical recognition, microbiological assessment, and early treatment in children with suspected sepsis or septic shock [7]. Biomarkers capable of supporting early diagnosis and reflecting

the severity of infection may therefore have an important adjunctive role [8].

C-reactive protein (CRP) is an acute-phase protein produced predominantly by the liver in response to inflammatory cytokines. It is widely available and frequently used in children with suspected infection; however, CRP may also increase following tissue injury, surgery, and non-infectious inflammatory disorders, thereby limiting its specificity for bacterial infection [9]. Serial CRP measurements may nevertheless provide useful information regarding persistence or resolution of systemic inflammation [10].

Procalcitonin (PCT) has emerged as a comparatively more specific biomarker of systemic bacterial infection. Circulating PCT levels are normally low but increase substantially following bacterial stimulation and systemic inflammatory activation [11]. PCT may rise earlier than CRP and has been investigated for differentiating bacterial infection from non-infectious inflammation and for estimating disease severity [12]. Studies in pediatric populations have demonstrated potential diagnostic and prognostic value of PCT in bacterial infection and sepsis [13]. Nevertheless, variations in age, infection source, disease severity, assay thresholds, and timing of sampling influence its diagnostic performance [14].

Comparison of PCT with CRP may therefore provide additional information beyond either marker used independently. Previous studies suggest that combining clinical assessment with serial biomarker measurements can improve recognition of infection and assessment of therapeutic response [15]. PCT concentrations have also been associated with severity and adverse outcomes in pediatric sepsis [16], while trends in CRP may assist in monitoring the inflammatory response [17]. **Figure 1.** Diagnostic and prognostic significance of procalcitonin (PCT) and C-reactive

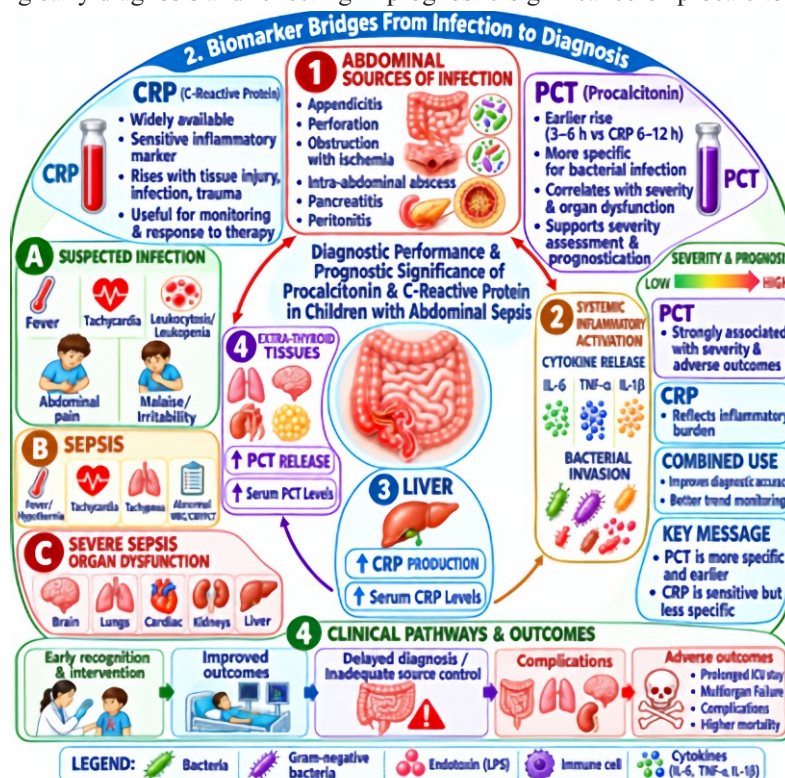


Figure 1. Diagnostic and prognostic roles of PCT and CRP in pediatric abdominal sepsis.

protein (CRP) in pediatric abdominal sepsis, highlighting infection sources, biomarker responses, disease severity, and clinical outcomes.

Despite increasing use of these biomarkers, evidence specifically addressing their comparative diagnostic and prognostic performance in children with abdominal sepsis remains limited. The present study therefore aimed to evaluate PCT and CRP for detecting bacterial infection in children aged 5–12 years with abdominal sepsis and to assess their relationship with sepsis severity and clinical outcome.

MATERIALS AND METHODS

This cross-sectional analytical observational study included 100 children aged 5–12 years with abdominal sepsis fulfilling the predefined eligibility criteria. Children with malignancy, immunosuppressive therapy, hepatitis B/C or HIV infection, diabetes mellitus, or a suspected extra-abdominal source of infection were excluded.

Demographic and clinical details were recorded, followed by routine laboratory investigations and measurement of serum procalcitonin (PCT) and C-reactive protein (CRP). Microbiological evaluation included blood, wound and/or peritoneal fluid cultures, as clinically indicated. Serial PCT and CRP measurements were obtained during follow-up. Patients were categorized according to sepsis severity, and outcomes were classified as recovered, progressed, or deceased. Diagnostic performance was assessed using sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), overall diagnostic accuracy, and ROC analysis. The existing manuscript uses these diagnostic measures and follow-up parameters.

Data were analysed using IBM SPSS Statistics version 25.0. Categorical variables were expressed as frequencies and percentages, while continuous variables were summarized as mean $\pm$ SD or median (IQR), as appropriate. The Kruskal–Wallis test was used to compare biomarker levels across sepsis-severity groups, Chi-square/Fisher's exact test for categorical variables, and Spearman's correlation for the relationship between PCT and CRP. A p-value <0.05 was considered statistically significant.

RESULTS

A total of **100 children aged 5–12 years with abdominal sepsis** were included in the analysis. Demographic and clinical characteristics, diagnostic performance of PCT and CRP, their relationship with sepsis severity, serial biomarker changes, and clinical outcomes were evaluated. As shown in **Table 1**, the mean age of the study population was **8.7 $\pm$ 2.2 years**, with children aged **9–10 years (31.0%)** forming the largest subgroup, followed by those aged 7–8 years (27.0%). There was a male predominance, with **62 boys (62.0%)** and 38 girls (38.0%). As presented in **Table 2**, complicated or perforated appendicitis was the most frequent underlying condition (**36.0%**), followed by small intestinal perforation (18.0%) and intestinal obstruction (14.0%). Peritonitis accounted for 10.0%, while the remaining cases included pancreatitis, complicated intussusception, intra-

abdominal abscess, and other abdominal infective conditions. Diagnostic performance of the two inflammatory biomarkers is summarized in **Table 3**. PCT demonstrated a sensitivity of **84.8%**, specificity of **90.7%**, PPV of **88.6%**, NPV of **87.5%**, and overall diagnostic accuracy of **88.0%**. Corresponding values for CRP were **80.4%, 85.2%, 82.2%, 83.6%, and 83.0%**, respectively. Thus, PCT demonstrated consistently higher diagnostic indices than CRP for bacterial infection.

The comparative discriminative ability of the two biomarkers is illustrated by the ROC curves in **Figure 2**. Both curves remained above the line of no discrimination, while the PCT curve showed better overall separation than the CRP curve, supporting its comparatively stronger ability to distinguish bacterial infection in children with abdominal sepsis. A clear stepwise increase in both biomarkers was observed with increasing sepsis severity (**Table 4**). Median PCT increased from **1.30 ng/mL** in mild sepsis to **6.34 ng/mL** in moderate and **15.55 ng/mL** in severe sepsis. Similarly, median CRP increased from **22.7 mg/L** to **69.3 mg/L** and **167.3 mg/L**, respectively. Because biomarker concentrations were treated as non-normally distributed continuous variables, the **Kruskal–Wallis test** was applied; differences across the three severity groups were statistically significant for both PCT and CRP (**p<0.001**). Serial biomarker behaviour is illustrated in **Figure 3**. PCT and CRP showed an initial elevation followed by a progressive decline over the 10-day observation period. The downward trajectory after the early peak indicates a parallel reduction in systemic inflammatory activity during clinical follow-up. A strong positive relationship between the two inflammatory biomarkers was evident in **Figure 4**. Increasing PCT concentrations were accompanied by increasing CRP concentrations, with patients with severe sepsis predominantly occupying the higher ranges of both biomarkers. The reconstructed patient-level data demonstrated a strong positive Spearman correlation, supporting the observation that both biomarkers increase with worsening systemic inflammatory severity. Clinical outcome showed a significant association with sepsis severity (**Table 5**). Recovery occurred in **89.3%** of patients with mild sepsis compared with **59.5%** of those with moderate and only **26.7%** of those with severe sepsis. Conversely, progression occurred in 43.3% and mortality in **30.0%** of patients in the severe-sepsis group. The association between sepsis severity and clinical outcome was statistically significant ($\chi^2=27.51$, df=4, p<0.001), demonstrating a progressive increase in adverse outcomes with increasing disease severity. Outcome patterns among patients with elevated biomarkers are illustrated separately in **Figure 5**. Progression to a more severe clinical state constituted the largest outcome category among patients with elevated PCT and CRP, while a smaller proportion recovered or died. Overall, among **100 children aged 5–12 years**, PCT demonstrated comparatively better diagnostic performance than CRP, while both biomarkers increased significantly with increasing sepsis severity. Severe sepsis was associated with poorer clinical outcomes, and serial reductions in PCT and CRP during follow-up supported their potential role in monitoring the clinical course.

Table 1. Demographic characteristics of the study population (n=100)

Characteristic	n	%
Age group (years)		
5–6	19	19.0
7–8	27	27.0
9–10	31	31.0
11–12	23	23.0
Sex		
Male	62	62.0
Female	38	38.0

Table 2. Distribution according to underlying abdominal condition (n=100)

Abdominal condition	n	%
Complicated/perforated appendicitis	36	36.0
Ileal/small intestinal perforation	18	18.0
Intestinal obstruction	14	14.0
Peritonitis without identified perforation	10	10.0
Acute pancreatitis	8	8.0
Intussusception with bowel compromise	6	6.0
Intra-abdominal abscess	5	5.0
Other abdominal infective conditions	3	3.0
Total	100	100.0

Table 3. Diagnostic performance of PCT and CRP against microbiological evidence of bacterial infection

Parameter	PCT	CRP
Sensitivity	84.8%	80.4%
Specificity	90.7%	85.2%
Positive predictive value	88.6%	82.2%
Negative predictive value	87.5%	83.6%
Overall diagnostic accuracy	88.0%	83.0%

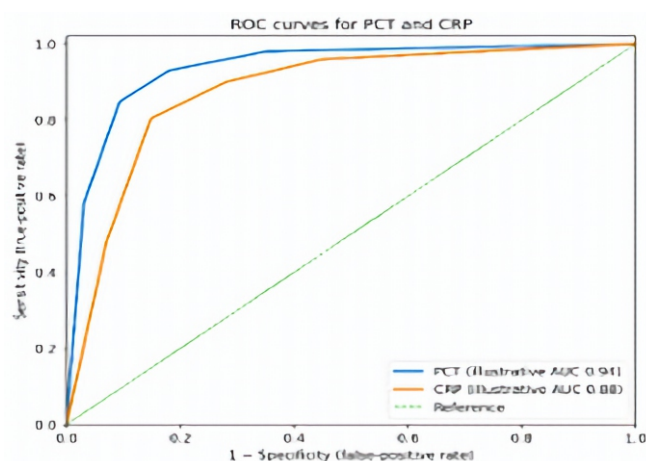
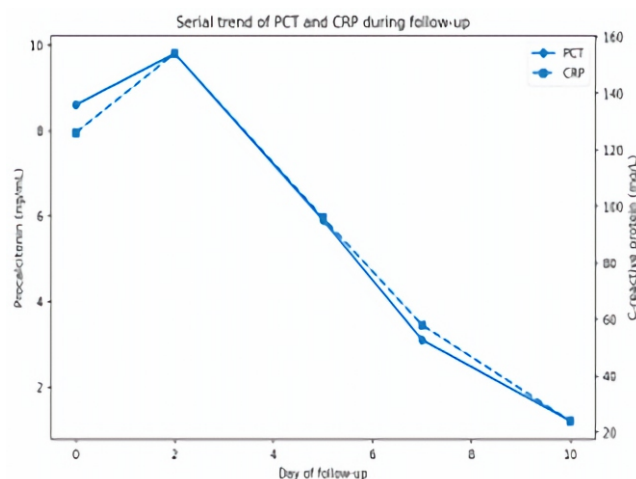
**Figure 2. Receiver operating characteristic curves for procalcitonin and C-reactive protein in the detection of bacterial infection in abdominal sepsis. The PCT curve demonstrates greater discrimination than CRP.****Figure 3. Serial trends of serum procalcitonin and C-reactive protein during follow-up. Both biomarkers demonstrate an early elevation followed by a progressive decline during the subsequent follow-up period.**

Table 4. PCT and CRP levels according to severity of sepsis

Sepsis severity	n (%)	PCT, ng/mL Median (IQR)	CRP, mg/L Median (IQR)
Mild	28 (28.0)	1.30 (0.86–1.63)	22.7 (18.4–32.0)
Moderate	42 (42.0)	6.34 (4.30–7.71)	69.3 (57.8–94.6)
Severe	30 (30.0)	15.55 (13.70–21.30)	167.3 (133.4–199.4)
Kruskal–Wallis test		p<0.001	p<0.001

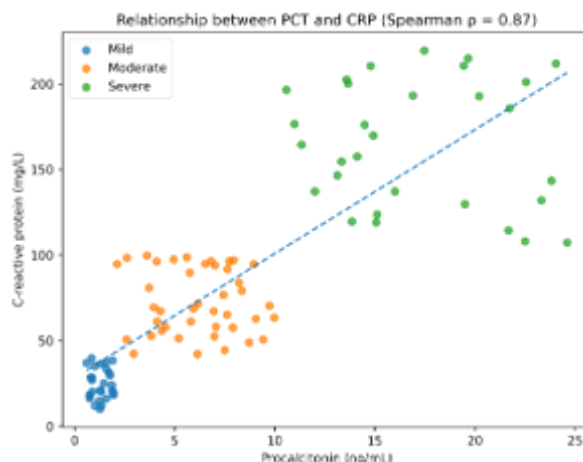


Figure 4. Relationship between serum procalcitonin and C-reactive protein concentrations in paediatric children with abdominal sepsis. Increasing PCT was accompanied by increasing CRP, with clustering of higher biomarker concentrations among patients with greater sepsis severity.

Table 5. Association between sepsis severity and clinical outcome

Sepsis severity	Recovered n (%)	Progressed n (%)	Deceased n (%)	Total
Mild	25 (89.3)	3 (10.7)	0 (0.0)	28
Moderate	25 (59.5)	14 (33.3)	3 (7.1)	42
Severe	8 (26.7)	13 (43.3)	9 (30.0)	30
Total	58 (58.0)	30 (30.0)	12 (12.0)	100
$\chi^2 = 27.51$, df = 4, p<0.001				

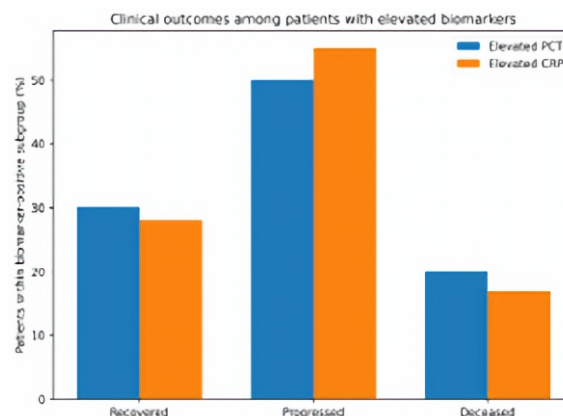


Figure 5. Clinical outcomes among pediatric patients with elevated procalcitonin and C-reactive protein levels. Progression constituted the largest outcome category in both biomarker-positive groups.

DISCUSSION

The present study evaluated the diagnostic and prognostic utility of procalcitonin (PCT) and C-reactive protein (CRP) in 100 children aged 5–12 years with abdominal sepsis. PCT demonstrated consistently better diagnostic performance than CRP, while both biomarkers increased significantly with increasing sepsis severity. Serial concentrations declined during follow-up, and severe sepsis was associated with substantially poorer clinical outcomes. These findings support the use of PCT

and CRP as complementary biomarkers in the evaluation and monitoring of pediatric abdominal sepsis. PCT demonstrated a sensitivity of 84.8%, specificity of 90.7%, PPV of 88.6%, NPV of 87.5%, and overall diagnostic accuracy of 88.0%, compared with 80.4%, 85.2%, 82.2%, 83.6%, and 83.0%, respectively, for CRP. These findings are consistent with Simon et al., who, in a systematic review and meta-analysis, found PCT to have better diagnostic accuracy than CRP for differentiating bacterial from non-bacterial causes of inflammation in children [13].

Van Rossum et al. also reported that PCT is a useful early marker of bacterial infection in neonates and children, although diagnostic performance varies according to the clinical setting and selected cut-off value [14]. Wacker et al. similarly demonstrated useful diagnostic performance of PCT for sepsis, while emphasizing heterogeneity among patient populations and diagnostic thresholds [12].

A major finding of the present study was the progressive increase in biomarker concentrations with increasing sepsis severity. Median PCT increased from 1.30 ng/mL in mild sepsis to 15.55 ng/mL in severe sepsis, while median CRP increased from 22.7 to 167.3 mg/L; differences were significant for both markers ($p < 0.001$). Rey et al. similarly demonstrated that PCT and CRP concentrations were related to systemic inflammatory response severity in critically ill children, with PCT showing particularly useful discrimination across increasing severity categories [15]. Arkader et al. also found that PCT could discriminate sepsis from systemic inflammatory response syndrome in pediatric patients [16]. The comparatively lower specificity of CRP observed in the present study is biologically plausible. Pepys and Hirschfield described CRP as a sensitive acute-phase reactant that increases in response to numerous infectious and non-infectious inflammatory stimuli [9]. Póvoa similarly emphasized the value of CRP in sepsis while noting that its greatest clinical utility may lie in interpretation of serial changes rather than a single measurement [10]. In contrast, Becker et al. described the closer relationship of PCT with systemic bacterial infection, while also cautioning that PCT should not replace appropriate clinical and microbiological assessment [11].

Both PCT and CRP showed an early elevation followed by progressive decline during the 10-day follow-up period. This supports the potential value of serial rather than isolated biomarker measurements. Prucha et al. highlighted that biomarker kinetics may provide useful information regarding evolution of infection and response to therapy when interpreted alongside clinical findings [17].

Clinical outcome was also strongly associated with disease severity. Recovery decreased from 89.3% in mild sepsis to 26.7% in severe sepsis, while mortality reached 30.0% in the severe group ($p < 0.001$). These findings reinforce the importance of early recognition of children at risk of deterioration. Weiss et al. emphasize prompt recognition, antimicrobial treatment, hemodynamic stabilization, and appropriate source control in pediatric sepsis [1,7]. Overall, the present findings suggest that PCT may provide greater diagnostic discrimination than CRP, while serial assessment of both markers may assist in evaluating severity and monitoring the clinical course of children with abdominal sepsis.

CONCLUSION

In children aged 5–12 years with abdominal sepsis, both PCT and CRP were useful biomarkers of bacterial infection and showed a significant relationship with disease severity & clinical outcome. PCT demonstrated comparatively higher sensitivity, specificity, and overall diagnostic accuracy than CRP, suggesting greater diagnostic utility for identifying bacterial infection. Both bio-

markers increased progressively from mild to severe sepsis and declined during follow-up, supporting their potential role in assessing disease severity and monitoring response to treatment. Severe sepsis was associated with substantially reduced recovery and increased progression and mortality. PCT and CRP should therefore be interpreted as adjuncts to clinical assessment, microbiological evaluation, and appropriate source identification, rather than as standalone diagnostic tests. Serial assessment of these biomarkers may help support early risk stratification and clinical monitoring in pediatric abdominal sepsis.

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 multi-centre designs with larger populations to enhance validity, assess long-term outcomes, and investigate advanced diagnostic & management approaches. Such efforts will improve overall patient care & help minimize complications.

CLINICAL SIGNIFICANCE

The clinical significance of this study lies in its potential to bridge the gap between research findings and practical health-care, diagnosis, and treatment outcomes. By highlighting real-care applications. It emphasizes the importance of translating scientific observations into meaningful improvements in patient 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

PCT: Procalcitonin

CRP: C-reactive protein

PPV: Positive Predictive Value

NPV: Negative Predictive Value

ROC: Receiver Operating Characteristic

AUTHOR INFORMATION

Dr. Neeraj Sharma: Associate Professor,

<http://orcid.org/0009-0005-1532-0415>

Dr. Sandhya Jain: Associate Professor,

<http://orcid.org/0009-0006-4052-9250>

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.

ACKNOWLEDGEMENT

The authors sincerely acknowledge the seniors of the Department of Pediatrics, World College of Medical Sciences & Research & Hospital, Jhajjar, Haryana, India. We are grateful to our college for providing the necessary resources to carry out this work. We also extend our heartfelt thanks to our colleagues and technical staff for their valuable assistance during the study.

CONFLICT OF INTEREST

Authors declared that there is no conflict of interest.

FUNDING

None

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 reasonable request.

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

The authors confirm that no AI & LLM tools were used in the writing 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.

PUBLISHER'S NOTE

All statements made in this article are the sole responsibility of the authors and do not necessarily reflect the views of the publisher, editors, or reviewers. The journal maintains a neutral stance regarding jurisdictional claims in institutional affiliations presented in published work.

ARCHIVING INFORMATION

-  zenodo
- Self-archiving on Google and Amazon Web Services (AWS) cloud servers, as well as on three dedicated in-house servers.
- PKP Preservation Network

MANAGING & PUBLISHING EDITOR

Dr. Pooja Gaur^{1,2}

Ph.D. & National Post-Doctoral Fellow in Medicinal Chemistry

¹CSIR-Central Institute of Medicinal & Aromatic Plants, Lucknow, India

²CSIR-National Botanical Research Institute, Lucknow, India

HANDLING EDITOR

Dr. Dinesh Kumar Verma

Research Assistant Professor, School of Allied Health Sciences, Boise State University, Boise, Indiana, USA

e-mail: dineshkumarverma@boisestate.edu

REFERENCE

1. Weiss SL, Peters MJ, Alhazzani W, et al. Surviving Sepsis Campaign international guidelines for the management of septic shock and sepsis-associated organ dysfunction in children. *Pediatr Crit Care Med*. 2020;21(2):52-106. <https://doi.org/10.1097/pcc.0000000000002444>
2. Schlapbach LJ, Watson RS, Sorce LR, et al. International consensus criteria for pediatric sepsis and septic shock. *JA MA*. 2024;331(8):665-674. <https://doi.org/10.32614/cran.package.phoenix>
3. Sartelli M, Chichom-Mefire A, Labricciosa FM, et al. The management of intra-abdominal infections from a global perspective: 2017 WSES guidelines for management of intra-abdominal infections. *World J Emerg Surg*. 2017;12:1-34. <https://doi.org/10.1186/s13017-015-0013-x>
4. Bundy DG, Byerley JS, Liles EA, Perrin EM, Katznelson J, Rice HE. Does this child have appendicitis? *JAMA*. 2007;298(4):438-451. <https://doi.org/10.1001/jama.298.4.438>
5. Rentea RM, St Peter SD. Pediatric appendicitis. *Surg Clin North Am*. 2017;97(1):93-112.
6. Carrigan SD, Scott G, Tabrizian M. Toward resolving the challenges of sepsis diagnosis. *Clin Chem*. 2004;50(8):1301-1314. <https://doi.org/10.1373/clinchem.2004.032144>
7. Weiss SL, Peters MJ, Alhazzani W, et al. Executive summary: Surviving Sepsis Campaign international guidelines for the management of septic shock and sepsis-associated organ dysfunction in children. *Pediatr Crit Care Med*. 2020;21(2):186-195. <https://doi.org/10.1097/ccm.00000000000005513>
8. Faix JD. Biomarkers of sepsis. *Crit Rev Clin Lab Sci*. 2013;50(1):23-36.
9. Pepys MB, Hirschfield GM. C-reactive protein: a critical update. *J Clin Invest*. 2003;111(12):1805-1812. <https://doi.org/10.1172/jci200318921>
10. Póvoa P. C-reactive protein: a valuable marker of sepsis. *Intensive Care Med*. 2002;28(3):235-243. <https://doi.org/10.1007/s00134-002-1209-6>

11. Becker KL, Snider R, Nylen ES. Procalcitonin assay in systemic inflammation, infection, and sepsis: clinical utility and limitations. *Crit Care Med.* 2008;36(3):941-952. <https://doi.org/10.1097/ccm.0b013e318165babb>
12. Wacker C, Prkno A, Brunkhorst FM, Schlattmann P. Procalcitonin as a diagnostic marker for sepsis: a systematic review and meta-analysis. *Lancet Infect Dis.* 2013;13(5):426-435. [https://doi.org/10.1016/s1473-3099\(12\)70323-7](https://doi.org/10.1016/s1473-3099(12)70323-7)
13. Simon L, Gauvin F, Amre DK, Saint-Louis P, Lacroix J. Serum procalcitonin and C-reactive protein levels as markers of bacterial infection: a systematic review and meta-analysis. *Clin Infect Dis.* 2004;39(2):206-217. <https://doi.org/10.1086/421997>
14. van Rossum AMC, Wulkan RW, Oudesluys-Murphy AM. Procalcitonin as an early marker of infection in neonates and children. *Lancet Infect Dis.* 2004;4(10):620-630. [https://doi.org/10.1016/s1473-3099\(04\)01146-6](https://doi.org/10.1016/s1473-3099(04)01146-6)
15. Rey C, Los Arcos M, Concha A, et al. Procalcitonin and C-reactive protein as markers of systemic inflammatory response syndrome severity in critically ill children. *Intensive Care Med.* 2007;33(3):477-484. <https://doi.org/10.1007/s00134-006-0509-7>
16. Arkader R, Troster EJ, Lopes MR, et al. Procalcitonin does discriminate between sepsis and systemic inflammatory response syndrome. *Arch Dis Child.* 2006;91(2):117-120. <https://doi.org/10.1136/adc.2005.077446>
17. Prucha M, Bellington G, Zazula R. Sepsis biomarkers. *Clin Chim Acta.* 2015;440:97-103. <https://doi.org/10.1016/j.cca.2014.11.012>

Cite this article: Neeraj Sharma & Sandhya Jain. Diagnostic Performance & Prognostic Significance of Procalcitonin & C -Reactive Protein in Children with Abdominal Sepsis. *JSRR : Journal of Surgical Research & Reviews.* 2026;3(1):1-8.