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THE RELATIONSHIP BETWEEN PAN-IMMUNE INFLAMMATORY VALUES IN DIFFERENTIATING COMPLICATED AND NON-COMPLICATED APPENDICITIS

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INTRODUCTION

- Acute appendicitis is the most common surgical emergency in children
- Delay in diagnosis increases the risk of perforation, sepsis, and prolonged hospitalisation
- The **Pan-Immune Inflammation Value (PIV)** is a novel, cost-effective inflammatory index derived from routine CBC parameters
- PIV is calculated as:(Neutrophil x Monocyte x Platelet) / Lymphocyte

MATERIAL AND METHOD

- Retrospective, single-center study, approved by the institutional ethics committee (2024/103)
- January 2018 – October 2024
- Patients aged 0–18 years undergoing appendectomy
- **Inclusion criteria:** Histopathological diagnosis available, preoperative CBC obtained
- **Exclusion criteria:** Missing data, chronic inflammatory disease, immunodeficiency, malignancy, systemic infection within 1 month, corticosteroid / immunomodulator therapy
- **Data collected:** Demographics, CRP, WBC, neutrophils, monocytes, lymphocytes, platelets, histopathology
- **PIV calculation:** (Neutrophils × Monocytes × Platelets) / Lymphocytes
- **Statistics:** ANOVA with Bonferroni post-hoc (continuous variables), Chi-square (categorical), ROC analysis (AUC, Youden Index). Significance level $p<0.05$.

RESULTS:

- Included 2,142 pediatric patients
- Mean age in the non-complicated group was significantly higher than in the complicated group ($p<0.001$)
- WBC, CRP, and PIV values were all significantly different across the three groups ($p<0.001$)
- CRP values in the complicated appendicitis group were significantly higher than in the other two groups ($p<0.001$)
- PIV values increased with disease severity, with Bonferroni analysis confirming significant differences among all groups ($p<0.001$) (Table 1)
- PIV has moderate discriminatory power in the diagnosis of appendicitis and, despite showing high sensitivity, its specificity remains limited (Figure 1)

Figure 1: ROC Analysis

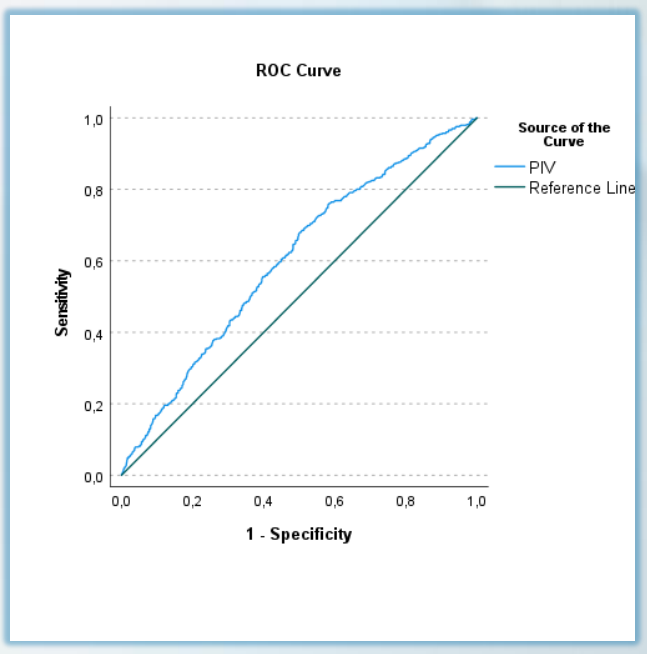

Table 1: Comparison of demographic and labaratory findings according to study groups

Parametre	Negatif apendektomi (n=202)	Nonkomplike apandisit (n=1387)	Komplike apandisit (n=553)	p değeri
Yaş (yıl, ort±SS)	11,07 ± 4,10	11,80 ± 3,57	10,70 ± 4,13	<0,001
Cinsiyet (E/K)	117/85	879/508	362/191	0,163
WBC (×10³/µL)	11,42 ± 4,33	14,13 ± 4,67	15,06 ± 4,95	<0,001
CRP (mg/L)	19,38 ± 34,03	43,23 ± 59,39	108,54 ± 98,46	<0,001
PIV (ort±SS)	1274,42 ± 1738,89	2030,51 ± 2157,84	2764,21 ± 2878,21	<0,001

CONCLUSION

- PIV values are significantly elevated in cases of pediatric appendicitis, particularly with increasing severity
- PIV is an accessible and cost-effective complementary biomarker. However, it is not sufficient for a definitive. diagnosis on its own due to its limited specificity
- The diagnostic power of PIV improves when it is evaluated alongside clinical findings and traditional markers such as CRP and WBC
- Prospective, multi-center studies are needed for further clinical validation