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Role of new serums biomarkers combination of diagnosis for acute appendicitis in childhood

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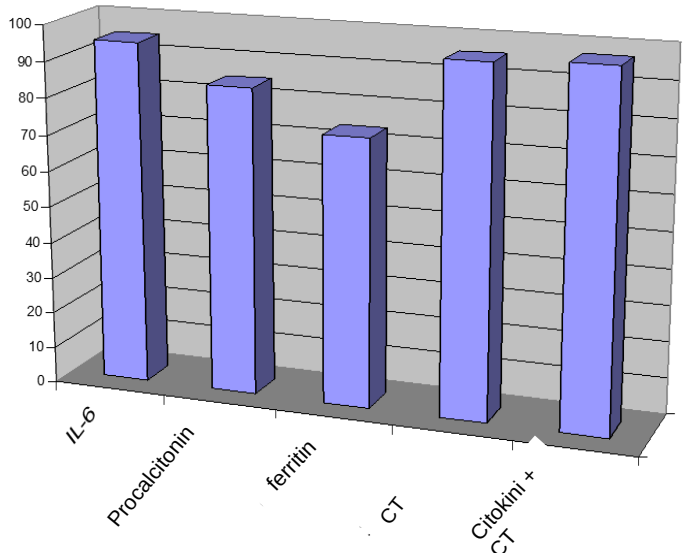
Background:
Traditional markers such as white blood cell count (WBC) and C-reactive protein (CRP) are widely used in diagnosing acute appendicitis in children. Recent studies suggest that new inflammatory markers — Procalcitonin, Interleukin-6 (IL-6), and Ferritin — may improve diagnostic precision and early differentiation between uncomplicated and complicated appendicitis.

Objective:
To compare routine diagnostic tests with novel proinflammatory biomarkers and to assess the diagnostic accuracy of combined serum marker models for acute appendicitis in children.

Methods:
A prospective, single-center cohort study including children ≤18 years, divided into three groups: uncomplicated appendicitis (AcA), complicated appendicitis (AuA), and controls (Ctr). Serum IL-6, Procalcitonin, and Ferritin were analyzed preoperatively. Diagnostic values were assessed by ROC curve analysis and correlation with histopathological findings.

Results:
Mean age: 7.6 ± 4.1 years (n = 152)
Serum IL-6 and IL-10 were significantly higher in appendicitis groups (P < 0.001).
Preoperative IL-6 > 9.7 pg/mL in 93.7 % of patients with phlegmonous appendicitis.
Combined IL-6 + Ferritin + Procalcitonin model:
Sensitivity = 90.3 %
Specificity = 90.8 %
Combined AcA vs AuA model: Sensitivity = 60 %, Specificity = 70 %.



Conclusion:
A combined diagnostic model including IL-6, Ferritin, and Procalcitonin demonstrates superior sensitivity and specificity compared with traditional CRP + WBC testing. This biomarker combination can optimize preoperative algorithms and facilitate timely surgical management in pediatric acute appendicitis.