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Cat Block 6, 2016-2017

**Reference:** Bachur et al. The Influence of Age on the Diagnostic Performance of White Blood Cell Count and Absolute Neutrophil Count in Suspected Pediatric Appendicitis. *Academic Emergency Medicine*. 2016; 23(11): 1235-1242

**Question:** Do the discriminative performance of the WBC count and ANC vary by age, and should the diagnostic thresholds be adjusted by age for guiding care in the evaluation of possible appendicitis in the pediatric population?

**Introduction:** The presentation of appendicitis can vary based on age, duration of symptoms and location of the appendix. Before the last 20 years, this was a clinical diagnosis based on history and physical exam alone. More recently clinical scores and algorithms have been developed to help discriminate appendicitis from other intra-abdominal pathology. Most scoring systems including the Alvarado Score and Pediatric Appendicitis Score utilize the WBC and absolute neutrophil count. Currently diagnostic thresholds are not adjusted by age.

**Methods:** This was a secondary analysis of a prospective multicenter observational study, the primary objective was to refine a clinical prediction rule for appendicitis. The age range was 3-18 years, exclusion criteria included pregnancy, prior abdominal surgery, chronic GI condition or severe developmental delay. During the secondary analysis patients were only included if the pain had been present for <72 hours, and a WBC with diff was obtained during the evaluation. The primary outcome was the presence or absence of appendicitis.

**Results:** 2,133 eligible patients, average age of 10.9 years, 48% female. 41% of patients had appendicitis and 10% of those were perforated. Those without appendicitis were diagnosed as nonspecific abdominal pain, gastroenteritis and constipation. The AUC for WBC and ANC was significantly greater in the 12-18 year-old group than the <5 and 5-11 year-old groups. With a WBC count threshold of 10,000, it was found that sensitivity decreased with increasing age, specificity increased with increasing age, PPV increased with increasing age but NPV was highest for children <5 years of age.

**Discussion:** This study found that the predictive capability of WBC count and ANC varies by age. It also found that the diagnostic value of WBC count and ANC did not vary with duration of abdominal pain. Limitations of this study include only using data from academic pediatric EDs, which may have increased the prevalence of appendicitis than what it otherwise may have been. Also the study placed patients into either a category of appendicitis or not appendicitis without taking into consideration the other diagnoses that may have elevated WBC count or ANC. Race and sex were not factored into this study and the sample size of children <5 years of age was small. Their conclusion was that the diagnostic performance of WBC count and ANC improves with increasing age and age adjusted values should be considered in diagnostic strategies for acute appendicitis.

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