

Comparison of the test characteristics of procalcitonin to C-reactive protein and leukocytosis for the detection of serious bacterial infections in children presenting with fever without source: a systematic review and meta-analysis.

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Abstract

STUDY OBJECTIVE:

We determine the usefulness of the procalcitonin for early identification of young children at risk for severe bacterial infection among those presenting with fever without source.

METHODS:

The design was a systematic review and meta-analysis of diagnostic studies. Data sources were searches of MEDLINE and EMBASE in April 2011. Included were diagnostic studies that evaluated the diagnostic value of procalcitonin alone or compared with other laboratory markers, such as C-reactive protein or leukocyte count, to detect severe bacterial infection in children with fever without source who were aged between 7 days and 36 months.

RESULTS:

Eight studies were included (1,883 patients) for procalcitonin analysis, 6 (1,265 patients) for C-reactive protein analysis, and 7 (1,649 patients) for leukocyte analysis. The markers differed in their ability to predict serious bacterial infection: procalcitonin (odds ratio [OR] 10.6; 95% confidence interval [CI] 6.9 to 16.0), C-reactive protein (OR 9.83; 95% CI 7.05 to 13.7), and leukocytosis (OR 4.26; 95% CI 3.22 to 5.63). The random-effect model was used for procalcitonin analysis because heterogeneity across studies existed. Overall sensitivity was 0.83 (95% CI 0.70 to 0.91) for procalcitonin, 0.74 (95% CI 0.65 to 0.82) for C-reactive protein, and 0.58 (95% CI 0.49 to 0.67) for leukocyte count. Overall specificity was 0.69 (95% CI 0.59 to 0.85) for procalcitonin, 0.76 (95% CI 0.70 to 0.81) for C-reactive protein, and 0.73 (95% CI 0.67 to 0.77) for leukocyte count.

CONCLUSION:

Procalcitonin performs better than leukocyte count and C-reactive protein for detecting serious bacterial infection among children with fever without source. Considering the poor pooled positive likelihood ratio and acceptable pooled negative likelihood ratio, procalcitonin is better for ruling out serious bacterial infection than for ruling it in. Existing studies do not define how best to combine procalcitonin with other clinical information.

Comment in

- Clinical decisions for pediatric Fever-still a hot mess? [Ann Emerg Med. 2012]