

Summary of Publication

Primary Care • Infectious Diseases

Key words:

General Pediatrics | Infectious Diseases | Febrile Children | CRP | WBC

Summary of publication

Discrepancy between total white blood cell counts and serum C-reactive protein levels in febrile children.

Ville Peltola, et al. Discrepancy between total white blood cell counts and serum C-reactive protein levels in febrile children. *Scandinavian Journal of Infectious Diseases*, Volume 39: 560-565, 2007.

Total white blood cell (WBC) count and serum C-reactive protein (CRP) are used as inflammatory markers in children with fever. An increase in only one of the markers is often seen when simultaneous measurements of WBC and CRP are used in everyday clinical practice.

The purpose of the study was to analyze the discrepancy between WBC and CRP levels in children with fever, and the connection of discordant or concordantly high values in these markers with severe bacterial-type diseases. Medical records of febrile children (1 month to 16 years of age) with $WBC \geq 15 \times 10^9/L$ and/or $CRP \geq 80$ mg/L, as well as children with lower values in both these parameters, were retrospectively reviewed from a 2-year period. WBC and CRP were discordant in 556 children and concordantly high in 194 children. A severe bacterial disease was presumed in 57 % of children with con-

cordantly high WBC and CRP, in 20 % of those with discordant values, and in 5 % of those with low levels of these markers ($p < 0.001$). Non-streptococcal tonsillitis was the most common viral infection associated with elevated WBC and CRP.

Conclusion

WBC and CRP are commonly discrepant in febrile children and measuring both markers substantially increases the detection rate of bacterial infection. The value of measuring both markers is supported by two findings. First, in a substantial proportion of children with severe bacterial-type disease, only one of either CRP and WBC is increased. Secondly, elevation of both parameters signifies a high risk of bacterial disease.

Comparison of C-Reactive Protein (CRP) and White Blood Cell (WBC)

- Both CRP and WBC are used as inflammatory/infection markers. CRP and WBC react differently over time and with different clinical conditions. WBC is rapidly increased at the onset of fever, whereas CRP peaks in ~2-4 days. Using both markers can increase detection of bacterial infections.¹⁻²
- Slightly increased CRP levels can be difficult to interpret and there are also non-bacterial diseases that might cause high CRP levels. This may mislead clinicians in the decision to prescribe antibiotics.¹
- A WBC count may be clinically relevant for other conditions than just infections/inflammations, e.g., suspected hematological malignancies, toxic marrow suppressions, unexplained and severe anemia.³

1. Melbye H et al. The course of C-reactive protein response in untreated upper respiratory tract infection. *Br J Gen Pract*. 2004 Sep;54(506):653-8.
2. Peltola et al. Discrepancy between total white blood cell counts and serum C-reactive protein levels in febrile children. *Scandinavian Journal of Infectious Diseases*. 2007; 39:560-565.
3. Laurells Klinisk Kemi i praktisk medicin (Laurell's Clinical Chemistry in Practical Chemistry), 2003, 8th edition.