

C-Reactive Protein, Procalcitonin, and White Blood Count to Rule Out Neonatal Early-onset Sepsis Within 36 Hours: A Secondary Analysis of the Neonatal Procalcitonin Intervention Study.

Clin Infect Dis. 2020 Sep 3;ciaa876. doi: 10.1093/cid/ciaa876.

Background: Neonatal early-onset sepsis (EOS) is one of the main cause of global neonatal mortality and morbidity, & initiation of early antibiotic treatment is key. However, unnecessary-prolonged antibiotics may be harmful.

Objective: To assess the diagnostic accuracy of serial measurements of C-reactive protein (CRP), procalcitonin (PCT), and white blood count (WBC) within different time windows (36 hours vs 48 hours) to rule out culture positive Neonatal EOS.

Method: A secondary analysis of results from the Neonatal Procalcitonin Intervention Study (NeoPins), a prospective, multicenter, randomized, controlled intervention study (May 2009 to Feb 2015) was done. Analyzed 1678 neonates: 10,899 biomarker measurements (4654 CRP, 2047 PCT, and 4198 WBC) obtained within the first 48 hours after the start of antibiotic therapy due to suspected EOS.

The Primary Outcome: The diagnostic accuracy of serial measurements of C-reactive protein (CRP), procalcitonin (PCT), and white blood count (WBC) within different time windows to rule out culture positive EOS (proven sepsis)

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



Normal serial CRP and PCT measurements within 36 hours rules out Early Onset Neonatal Sepsis

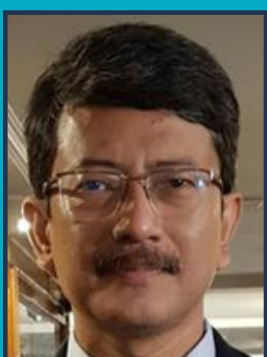
Results:

- The areas under the curve (AUC) comparing no sepsis vs proven sepsis for maximum values of CRP, PCT, and WBC within 36 hours were 0.986, 0.921, and 0.360, respectively
- The AUCs for CRP and PCT increased with extended time frames up to 36 hours, but there was no further difference between start to 36 hours vs start to 48 hours.
- Cutoff values at 16 mg/L for CRP and 2.8 ng/L for PCT provided a sensitivity of 100% for discriminating no sepsis vs proven sepsis.
- The results analysis of CRP, PCT, and WBC within the first 48 hours after start of antibiotics for suspected EOS showed good accuracy to exclude culture-positive sepsis for CRP and PCT, but not for WBC, in this study.

Key Message:

- Up to 7% of term/late-preterm neonates receive antibiotics during the first 3 days of life because of suspected EOS, where prevalence of culture-proven EOS is 0.1% or less, suggesting substantial overtreatment.
- Normal serial CRP and PCT measurements within 36 hours after the start of empiric antibiotic therapy can exclude the presence of neonatal EOS with a high probability (100% sensitivity).
- The negative predictive values of CRP and PCT do not increase after 36 hours

EXPERT COMMENT



“Availability of reliable biomarkers to rule out early onset neonatal sepsis is an important tool for clinicians to stop unnecessary and prolonged antibiotics in newborn and thereby decrease harmful side effects and also decrease antibiotic resistance.”

Dr Mritunjay Pao, MD Ped
Senior Consultant & Intensivist
Sanjivani Hospital, Jorhat, Assam

Dr Avneet Kaur: Section Editor : Academic Pearl: Comment: “ Good negative prediction value of CRP & PCT in first 36 hrs of life is a good guide for holding antibiotics & preventing undue use of antibiotics for EOS (which is very low in incidence)”

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National President 2020

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Hon. Secretary Gen. 2020-21

Reference

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