

A Retrospective Study to Evaluate the Predictive Value of an Early-Onset Sepsis Risk Calculator in Neonates Exposed to Maternal Chorioamnionitis

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Introduction: Maternal chorioamnionitis is a well-known risk factor for early onset sepsis (EOS) in neonates. The American Academy of Pediatrics (AAP) suggests use of a multivariate risk assessment model which integrates newborn risk factors and clinical conditions, while making recommendations for management and treatment. Kaiser Permanente developed a web-based Neonatal EOS Risk Calculator with recommended clinical algorithms that are based on the final risk estimate. The use of this calculator has resulted in a 48% decline in empiric antibiotic administration in certain centers.

Objectives: 1) To determine the predictive value of the Kaiser Permanente EOS calculator in identifying EOS in a retrospective cohort of neonates ≥ 35 weeks of gestation born to mothers with chorioamnionitis; 2) To determine the association of C-reactive protein (CRP) levels at 24 hours of life in chorioamnionitis-exposed newborns with clinical illness.

Materials and Methods: We collected data from mother-infant dyads with the diagnosis of maternal chorioamnionitis admitted at Ascension St. John hospital (1/1/2010 to 7/31/2020). Each neonate's EOS risk was determined using the EOS calculator and management recommendations were obtained and compared to the standard of care. Data were analyzed using chi-squared test, Student's t-test and analysis of variance.

Results: Of 221 mother-infant dyads, EOS was diagnosed in 55 neonates (24.9%), of which only five had positive blood cultures. The EOS calculator correctly identified EOS risk and

recommended empiric antibiotics and/or blood culture in 93% of these neonates including four with positive blood cultures ($p < 0.001$). Median CRP at 24 hours was higher in neonates with EOS compared to neonates without EOS ($p = 0.02$).

Conclusions: The Kaiser Permanente EOS calculator is a valuable tool that helps to identify neonates at increased risk of EOS. The use of this calculator can result in a significant decrease in antibiotic exposure in neonates and enables a safe and effective way to assess risk of EOS.

