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An Optimal Cut-off Point of Serum C-Reactive Protein in Prediction of Neonatal Sepsis

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Abstract

Objective: To determine an optimal cut-off point of serum C-reactive protein (CRP) levels for prediction of neonatal sepsis.
Material and Method: A prospective cohort study of neonates aged from birth to 30 days old presenting with signs and symptoms of neonatal sepsis in neonatal intensive care unit (NICU) from January 2010 through December 2011 was performed. Neonates were assigned to either sepsis or normal group depending on blood culture status. Serial CRP (12-24 hours apart) and complete blood count were then analyzed using independent t-test, Wilcoxon rank-sum test and Receiver operating characteristic (ROC) curves.
Results: Of 53 neonates recruited into the present study, 26 (49%) were assigned to sepsis group and the remaining 27 (51%) were assigned to normal group. Baseline characteristics for the two groups were similar except for the higher amount of male participants in sepsis group (p-value 0.006). Most patients in sepsis group (7/26) demonstrated coagulase-negative staphylococci (CoNS) sepsis. The values of 1st CRP and 2nd CRP were significantly higher in sepsis group compared to normal group (pvalue < 0.001 and 0.003). From ROC curves, at the cut-off points of 1st CRP > 1.90 mg/L and 2nd CRP > 1.25 mg/L, the sensitivity were as high as 92.6% and 96.3%, respectively, and the specificity were both at 100%.
Conclusion: Serial CRP is safe as diagnostic tool to consider antimicrobial treatment in neonatal sepsis with sensitivity of 92.6% and 96.3% for the first CRP cut-off point > 1.90 mg/L and the second CRP > 1.25 mg/L with 100% positive predictive value. Moreover, these safety profiles might help in reducing overuse of antibiotics with negative predictive value 96.3%.

Keywords: Neonatal sepsis, Neonatal infection, C-reactive protein (CRP)

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