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Research Article

Correlation of C- reactive protein and Blood culture in Neonatal Sepsis in a Tertiary Health Care Centre of South India

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ABSTRACT

Introduction: Neonatal sepsis is a common cause of neonatal morbidity and mortality. Gold standard method for diagnosing neonatal sepsis is blood culture but it is time consuming, requires well equipped laboratory and trained laboratory personnel. Serum C-Reactive Protein (CRP) is an acute phase reactant, which is released in response to the inflammatory reaction. CRP levels reflect the individual's association between microbial infection. This study is conducted for evaluation of CRP role in the blood as early marker in neonatal sepsis and to find its correlation with blood culture. **Methodology**: This study was conducted in microbiology laboratory from Nov 2022 to Feb 2023 to evaluate the correlation of C-Reactive Protein and Blood Culture in Neonatal Sepsis. Suspected neonatal sepsis cases in the department of Pediatrics were included in the study. After taking aseptic precautions, 1-2 ml of blood was collected and inoculated into blood culture bottle containing 5 ml of Brain Heart Infusion Broth. CRP level was detected by Latex Agglutination Card test. **Results**: Out of total 350 samples, 246 were from female and 104 were from male. Among350 samples tested,43 were blood culture positive and 156 were CRP positive. All blood culture positive samples were CRP positive also. Among the blood culture negative samples, 113 were CRP positive. **Conclusion**: Early diagnosis of neonatal sepsis with the help of biomarkers like C-Reactive Protein plays a major role in reducing mortality & morbidity among the neonates.

Key Words: *CRP- C- reactive protein, Neonatal sepsis, inflammation ,Neonatal mortality*

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INTRODUCTION

Neonatal sepsis refers to an infection involving the bloodstream in newborn infants less than 28 days old. It remains a leading cause of morbidity and mortality among neonates, especially in middle and lower-income countries and liable for 42% of deaths in 1st week of life and 13% of all neonatal morbidity [1,2]. The diagnosis of newborn sepsis is still difficult. Gold standard method for diagnosing neonatal sepsis is blood culture but it is time consuming, requires well equipped laboratory and trained laboratory personnel [3]. CRP is acute phase reactant & inflammatory marker synthesized in liver that in response to the inflammatory cytokines (IL-1, IL-6 and TNF-α) & also plays a major role in the innate immunity [4]. An ideal sepsis biomarker will not only help in the guidance of the use of antibiotics when not needed but also the duration of the course of antibiotics if sepsis is proven. This study is conducted for evaluation of CRP role in the blood as early marker in diagnosing neonatal sepsis and to find its correlation with blood culture.

METHODOLOGY

This study was conducted in microbiology laboratory from Nov 2022 to Feb 2023 to evaluate the correlation of C-Reactive Protein and Blood Culture in Neonatal Sepsis. The institutional ethics committee clearance was obtained to conduct the study. Suspected neonatal sepsis cases in the department of Pediatrics were included in the study. After taking aseptic precautions, 1-2 ml of blood was collected and inoculated into blood culture bottle containing 5 ml of Brain Heart Infusion Broth. Blood culture bottles were incubated at 37°C aerobically overnight. Blood culture bottles were examined for turbidity and gas production. Subculture was done on blood agar and Mac Conkey agar. If no growth occurred on plates after overnight incubation the bottles were incubated further and observed daily for indicators of growth till seven days. A final subculture was done at the end of day seven. The colonies grown on blood agar and Mac Conkey agar were identified by conventional methods according to standard laboratory procedure, including colony morphology, Gram stain and biochemical reactions [5]. CRP level was detected by Latex Agglutination Card test

(PRECISION BIOMED Pvt. Ltd). CRP was reported as positive if the agglutination particles were detected and negative if there are no agglutination particles seen.

DISCUSSION

This study is conducted for evaluation of CRP role in the blood as early marker in neonatal sepsis and to find its correlation with blood culture. All 350 blood samples from babies tested for blood culture and CRP were under 4 weeks old. Out of 350 samples, majority were from female babies (246), however male babies (53.8%) were more affected than female babies (46%), these findings are similar to the study of Rajendraprasad, B. P. M et al [6].

In this study, out of 350 samples ,43 were blood culture positive and 156 were CRP positive Among43 blood culture positive samples, 43 were positive for CRP which is similar to study of Hisam uddin E et al [7] and among the blood culture negative samples, 113 were CRP positive. These biomarker (CRP) hold a promising position as early marker in the management of neonatal sepsis despite of culture negative findings. This false negative result may be due to improper collection of sample, prior antibiotic therapy.

TABLE and FIGURES:

Table 1:Comparison between C- reactive protein and Blood Culture

Total blood samples taken		
Blood culture positive	**CRP positive**	**Blood culture negative-CRP positive**
43	156	113

CONCLUSION

Early diagnosis of neonatal sepsis plays an important role in the reducing neonatal morbidity and mortality. CRP can help in providing presumptive diagnosis of sepsis before blood culture is positive and it helps in early initiation of antibiotic therapy. However, CRP estimation does have a role in the diagnosis of neonatal sepsis but the test is not specific enough to be relied upon as the only indicator.

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CONFLICT OF INTEREST: Nil

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