

Correlation of C - reactive protein and Blood Culture in Neonatal Sepsis in A Tertiary Health Care Centre, Bhavnagar

Dr. Harsh Singel^{1*}, Dr. Shirishkumar patel², Dr. Kairavi Desai³

¹Assistant Professor, ²Assistant Professor, ³Head of Department, Microbiology Department, Government Medical College, Bhavnagar, Gujarat, India

DOI: [10.36348/sjpm.2021.v06i02.001](https://doi.org/10.36348/sjpm.2021.v06i02.001)

| Received: 18.01.2021 | Accepted: 02.02.2021 | Published: 04.02.2021

*Corresponding author: Dr. Harsh Singel

Abstract

Introduction: The Neonatal sepsis defines as blood infection that will occurs in newborn at the first four weeks from birth. Gold standard method is for diagnose of neonatal sepsis that is blood culture but that is time consuming, requires well equipped laboratory and trained laboratory personnel. The study is planned for evaluation of CRP role in the blood as most early marker in neonatal sepsis & find the correlation with blood culture. **Materials And Method:** The study was done in microbiology laboratory at Sir-T Hospital, Bhavnagar, Gujarat from may, 2020 to October , 2020 to understand the Correlation of C-Reactive Protein and Blood Culture in Neonatal Sepsis. After filling the form of patient's details in pre-designed proforma the 1-2 ml of blood collected aseptically and its was inoculated into blood culture bottle containing 5 ml of Brain Heart Infusion Broth. CRP level was done by Latex Agglutination Card test. **Results:** Out of total 481 samples 129 were males and 352 were females. Out of the total 481 samples, 58 were blood culture positive from which 58 were positive for CRP also. Among the blood culture negative samples, 55 were CRP positive. **Conclusion:** There is Early diagnosis of neonatal sepsis within the aid of biomarkers like C-Reactive Protein may be serve as an important tool in the reducing mortality & morbidity among the neonates.

Keywords: CRP- C - reactive protein, IL- Interleukin, TNF- α - Tumor Necrosis Factor Alpha.

Copyright © 2021 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

The Neonatal sepsis defines as blood infection that will occur in newborn at the first four weeks from birth [1]. After the prematurity and intrapartum complications the neonatal sepsis that is the 3rd leading cause of mortality in neonates & liable for 42% of deaths in 1st week of life & 13% of all the neonatal mortality [2]. Gold standard method is for diagnose of neonatal sepsis that is blood culture but that is time consuming, requires well equipped laboratory and trained laboratory personnel. That may be false negative due to small amount of blood drawn from the neonates and prenatal antibiotic [3]. The CRP was 1st demonstrated by Tillet and Francis at Rockefeller University in 1930 [4]. CRP is acute phase reactant & inflammatory marker synthesised 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 [5]. The study is planned for evaluation of CRP role in the blood as most early marker in neonatal sepsis & finds the correlation with blood culture.

MATERIALS AND METHOD

The study was done in microbiology laboratory at Sir-T Hospital, Bhavnagar, Gujarat from may, 2020 to October, 2020 to understand the Correlation of C-Reactive Protein and Blood Culture in Neonatal Sepsis.

After filling the form of patient's details in pre-designed proforma the 1-2 mL of blood collected aseptically and its was inoculated into blood culture bottle containing 5 mL of Brain Heart Infusion Broth. Blood culture bottles were incubated at 37°C aerobically. Overnight incubated blood culture bottles were examined for indicators of growth like the turbidity, gas production, haemolysis or discrete colonies on the surface of sedimented red cells. If any of these were present subculture was done on blood agar and MacConkey 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 MacConkey agar were identified by conventional methods according to standard laboratory protocol, including colony morphology, Gram staining and biochemical reactions [6].

CRP level was done by Latex Agglutination Card test (PATHOZYME DIAGNOSTICS). CRP was reported as positive if the agglutination particles were detected and negative if there is no particles were seen [7].

OBSERVATION & RESULTS

In our study, Total 481 samples were tested for blood culture and CRP and the Age of babies was under 4 weeks older.

Out of total 481 samples 129 were males and 352 were females. Out of the total 481 samples, 58 were blood culture positive from which 58 were positive for CRP also. Among the blood culture negative samples, 55 were CRP positive.

Table-1: Study variables in comparison between C - reactive protein and Blood Culture

| Total Samples Taken – 481 | | |
|---------------------------|--------------|-------------------------------------|
| Blood culture positive | CRP positive | Blood culture negative-CRP positive |
| 58 | 113 | 55 |

DISCUSSION

This study was conducted for Correlation of C - reactive protein and Blood Culture in Neonatal Sepsis in the region.

In Our study male babies (57%) were affected more than female babies (43%) who were similar to findings of other studies reported from India [8, 9].

In our study, out of the 58 blood culture positive samples, 58 were positive for CRP which was similar to studies done by Gowsami Y et al. and Hisamuddin E et al., [10] and out of 481 samples 113 were found CRP positive. The Underlying pathogen in the sepsis there is greatly influences the magnitude of CRP.

CONCLUSION

There is early diagnosis of neonatal sepsis within the aid of biomarkers like C - reactive protein may be serving as an important tool in the reducing mortality & morbidity among the neonates.

The estimation of CRP can help in the providing presumptive diagnosis of septicaemia and started antibiotic therapy before the blood culture comes positive.

REFERENCES

1. Paolucci, M., Landini, M. P., & Sambri, V. (2012). How can the microbiologist help in diagnosing neonatal sepsis?. *International journal of pediatrics*, 2012.
2. Zea-Vera, A., & Ochoa, T. J. (2015). Challenges in the diagnosis and management of neonatal sepsis. *Journal of tropical pediatrics*, 61(1), 1-13.
3. Kumar, B. (2013). Evaluation of serum C-reactive protein in diagnosis and prognosis of neonatal septicemia.
4. Tillett, W. S., & Francis Jr, T. (1930). Serological reactions in pneumonia with a non-protein somatic fraction of pneumococcus. *The Journal of experimental medicine*, 52(4), 561.
5. Jan, A. Z., Zahid, S. B., & Ahmad, S. (2012). Role of c-reactive protein in diagnosing neonatal sepsis. *Khyber Medical University Journal*, 4(4).
6. Mackie and McCartney. *Practical Medical Microbiology* (14th Edition). Author, John Gerald Collee. Edition, 14. Publisher, Elsevier publication.
7. Pathozyme, D. CRP TEST, Latex slide test method, kit manual An ISO 9001:2003.CE & GMP Certified Company.
8. Rajendraprasad, B. P. M., Basavaraj, K. N., & Antony, B. (2013). Bacterial spectrum of neonatal septicemia with their antibiogram with reference to various predisposing factors in a tertiary care hospital in Southern India. *Annals of Tropical Medicine and Public Health*, 6(1), 96.
9. Sharma, A., Krishna Kutty, C. V., Sabharwal, U., Rathi, S. U. S. H. I. L. A., & Mohan, H. (1993). Diagnostic and prognostic role of CRP and m-ESR in neonatal septicemia. *Indian pediatrics*, 30, 347-347.
10. Hisamuddin, E., Hisam, A., Wahid, S., & Raza, G. (2015). Validity of C-reactive protein (CRP) for diagnosis of neonatal sepsis. *Pakistan journal of medical sciences*, 31(3), 527.