Journal of Islamabad Medical & Dental College (JIMDC); 2016:5(3):131-133

Original Article

Diagnostic Value of Combined: C- Reactive Protein, Total Leukocyte Count and Platelet Count in Neonatal Sepsis

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Abstract

Objective: This study was designed to evaluate the diagnostic value of combination of Total Leukocyte Count, Platelet count and C - reactive protein for the diagnosis of neonatal sepsis.

Patients and Methods This cross-sectional study was conducted at Department of Pediatrics, DHQ hospital, Sargodha. Blood samples for Sepsis work-up including C-reactive protein (CRP), Platelet count, TLC and blood culture collected were before the initiation of antibiotic therapy. The complete blood count was done on the automated hematology analyzer; CRP level estimation was done by Latex agglutination method. Patient having abnormal values of TLC, CRP and Platelet count were followed by report of blood culture which was used as gold standard for the diagnosis of Neonatal sepsis.

Results: There were 98(38%) male and 162(62%) female patients with mean age of 1.8 ± 1.6 days. C-reactive protein, total leukocytes counts and platelet count collectively, were abnormal in 132(50.7%) suspected neonates with sepsis. Blood culture was found positive in 166(63.8%) neonates. The sensitivity, specificity, positive and negative predictive value of combined abnormal CRP, total leukocyte counts and platelet count was 75.3%, 92.5%, 94.6% and 67.9% respectively.

Conclusion: The diagnostic value of combined abnormal tests (CRP, TLC and platelet count) was found significant and can be used for the early diagnosis of neonatal sepsis when boold culture results are awaited.

Keywords: C - reactive protein, Neonatal sepsis, Total Leukocyte Count, Platelet count.

Introduction

Neonatal sepsis is defined as a clinical syndrome of bacteremia characterized by signs and symptoms of infection in the first four weeks of life.[1] It encompasses various systemic infections of the newborn such as septicemia, meningitis, pneumonia and urinary tract infections. Neonatal sepsis is one of the major causes of neonatal mortality in the developing countries contributing to 12% of all neonatal deaths,[2] and it continues to be a major cause of morbidity and mortality in Pakistan.[3] Blood culture is still considered to be the 'gold standard' for diagnosis of neonatal sepsis. The yield of a positive blood culture ranges from 8-73% as shown in various studies.[4-7] However, the technique of blood culture is time consuming and demands a well-equipped laboratory which is not available in most of the community hospitals.[5]

Therefore, there is need for a test that is cheap and can be easily performed with quick availability of reports.[6] An ideal diagnostic test for neonatal sepsis should have maximum sensitivity and specificity.[7] There are other tests which may support diagnosis in such cases. CBC with the absolute neutrophil count and CRP are amongst the most frequently used.[8]

Combination of abnormal total leukocyte count, platelet count and C - reactive protein have been used to evaluate infants with sepsis or with probable sepsis in different studies.[9] In one study, the positive predictive value for combination (TLC, Platelet count, CRP) was 79.24%.[10] The rationale of this study was to evaluate the diagnostic value for combination (TLC, platelet count and CRP) for evaluation of patients with neonatal sepsis.

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Received: Aug 22, 2016; Accepted: Oct 16, 2016

Patients And Methods

This Cross-sectional study was carried out at Department of Pediatrics, DHQ hospital, Sargodha from March to August 2014. Non-probability sampling technique was used and neonates suspected to have early neonatal sepsis were included. Neonatal sepsis was clinically suspected if a neonate presented within first 7 days after birth with two or more of these; temperature instability < 35 or > 38.5°C, tachypnea > 60/min, tachycardia > 200/min or capillary refill > 3 sec.[11] Neonate who received antibiotics before admission or having major congenital abnormalities were excluded. Approval was taken from hospital ethical committee and informed consent was obtained from parents. Each neonate was examined by a pediatric resident and blood samples were collected before the initiation of