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Use of hematological inflammatory markers in the diagnosis of neonatal sepsis

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INTRODUCTION: Neonatal sepsis is a severe clinical syndrome defined by a systemic infection confirmed by blood culture (gold standard) and is associated with high morbidity and mortality. Diagnostic accuracy remains a challenge, as classical methods such as blood culture, the Rodwell Score, and C-reactive protein (CRP) present limitations in sensitivity and specificity. In this context, inflammatory hematological biomarkers, such as the neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), lymphocyte-to-monocyte ratio (LMR), and the Systemic Immune-Inflammation Index (SII), represent promising, low-cost alternatives with broad clinical applicability, with the potential to optimize disease diagnosis and reduce the indiscriminate use of antibiotics. **METHOD**: A retrospective study was conducted through the analysis of medical records of newborns diagnosed with neonatal sepsis and admitted to the Hospital da Mulher de São Bernardo do Campo between January 2022 and December 2024. **RESULTS**: A total of 120 patients were included, of whom 54 were female and 66 male. Regarding birth weight, 32 had adequate weight, 26 had low birth weight, 13 had very low birth weight, and 49 had extremely low birth weight. Concerning gestational age, 29 were born at term, 18 were late preterm, 13 were moderate preterm, and 60 were extremely preterm. The average Apgar score was 5.76 at the 1st minute and 7.78 at the 5th minute. The average length of stay in the intensive care unit was 47 days, and the average hospital stay was 61 days; the average maternal age was 27 years. Regarding outcomes, 89 newborns showed clinical improvement and 27 died. Comparative analysis demonstrated higher values of NLR (3.89 vs. 2.41) and SII (1,117,984 vs. 552,836) in positive blood cultures compared to negative blood cultures ($p < 0.05$). PLR showed higher values when the Rodwell Score and CRP were abnormal (59,116 vs. 207.88 and 52,136 vs. 474.58, respectively). **DISCUSSION**: The parameters NLR, PLR, and SII demonstrated statistically significant differences among the analyzed groups, confirming their relevance for a faster and more effective diagnosis of late neonatal sepsis. **CONCLUSION**: These biomarkers show potential to enable interventions with greater diagnostic precision and targeted therapeutic approaches, demonstrating their positive predictive value.

KEYWORDS: Newborn; Neonatal sepsis; Biomarkers.

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