Postgraduate Journal of Pediatrics and Adolescent Medicine
Volume 1, Issue 2 - 2025, Pg. No. 1-2
Peer Reviewed & Open Access Journal

Editorial

Neonatal Sepsis: The Quest for An Ideal Biomarker

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How to cite this article:
Bhaskar V. Neonatal Sepsis: The Quest for An Ideal Biomarker. Postgrad J Pediatr Adol Med. 2025;1(2):1-2.

Despite recent advances in neonatal care, sepsis continues to be a predominant contributor to mortality in neonates. Bacterial pathogens that are transmitted from the mother to the infant before/ during the delivery cause Early-Onset neonatal Sepsis (EOS). It occurs before 72 hours of birth. This is in contrast to Late-Onset Sepsis (LOS), which is due to an infection acquired either from the hospital or from the community.

Timely diagnosis of neonatal sepsis has been challenging. The clinical signs are often very subtle, or they overlap with other non-infectious conditions (inborn errors of metabolism, hypothermia, asphyxia), making the diagnosis even more difficult. While a prompt use of antibiotics is necessary, its irrational use has its own medical and financial implications. The need for an ideal biomarker thus remains as critical as ever.

A urinary biomarker could prove to be a useful screening tool for neonatal sepsis owing to its non-invasive nature and ease of collection. Lactate has been used as a marker of hypoxia and poor perfusion in various conditions in paediatric and neonatal populations.[1,2] Urinary lactate has been studied in conditions like hypoxic-ischemic encephalopathy and bronchopulmonary dysplasia and has proven useful,[3,4] but it has not been studied in sepsis.

Normal lactate levels in newborns, however, are not well defined. Moreover, in patients with severe sepsis and septic shock, increased lactate is said to be due to impaired clearance rather than excess production. Therefore, increased lactate levels are unlikely to be raised in the early phase of sepsis when tissue perfusion is not compromised. In a study by Bhat et al.,[5] urinary and plasma lactate levels were not able to differentiate babies developing EOS from those who were not at both 2 hours of life and 24 hours of life. However, urinary lactate turned out to be a better marker than plasma lactate for diagnosing mortality and sepsis with shock in babies at risk of EOS. Further studies with larger sample sizes are needed to analyse the utility of urinary lactate in neonatal sepsis.

An ideal biomarker for sepsis should provide an accurate and early rapid diagnosis, and should aid in prognosis and provide guidance in

treatment. Till now, no "ideal" biomarker is available that can be used singularly to diagnose sepsis, and a combination of biomarkers is currently our best choice. The advances in the field of genomics and metabolomics could be decisive in future diagnostics, but as of now, the quest continues.

Source of Funding: None

Conflict of Interest: None

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