Research & Reviews: A Journal of Microbiology and Virology
ISSN: 2230-9853 (Online), ISSN: 2349-4360 (Print)
Volume 8, Issue 1
www.stmjournals.com

Presepsin: A Novel Marker for the Neonatal Sepsis: A Brief Review

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Abstract

Neonatal sepsis has been recognized as a global health problem with high incidence across the globe. Delay in the early diagnosis leads to increase in the morbidity and mortality. Several biomarkers have been studied and evaluated for the possible early detection of the neonatal sepsis. In present review, the application of presepsin for the possible potential biomarker for the neonatal sepsis has been evaluated.

Keywords: *Neonatal sepsis, biomarkers, presepsin*

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INTRODUCTION

Neonatal sepsis is a systemic infection occurring in neonates associated with the bacteraemia with the positive blood culture. According to the timing of the onset, the neonatal sepsis is further classified into early onset and late onset. The early onset has been associated with the occurrence of sepsis during the delivery and late onset is associated with the nosocomial infections [1]. It has been recognized as a global health problem and the incidence of the neonatal sepsis is varied worldwide ranging from 7.1 to 38 per 1000 lives in Asian countries, 6.5 to 23 per 1000 live births in African region [1]. In India, the incidence of the neonatal sepsis is 30 per 1000 live births. A study conducted by Sarasam and co-workers has shown the incidence of culture positive sepsis is 21.5%, out of which the early onset sepsis has been noticed in 54% of the cases [2]. Several bacteria have been known to be associated with the neonatal sepsis including gram negative bacteria such as *Klebsiella penumoniae, Pseudomonas Sp* [3]; and in gram positive mainly includes the coagulase negative *Staphylococcus aureus, Streptococcus penumoniae* and *Streptococcus pyogenes* Sp. [4]. Delay in the diagnosis and initiation of therapy and treatment may lead to increase in the morbidity and mortality. Several biomarkers have been studied and evaluated for the possible early detection of the neonatal sepsis. The C-reactive protein, procalcitonin, serum amyloid A, lipo-polysaccharide binding protein, cytokines and anti-inflammatory cytokines are evaluated for the possible biomarker for the neonatal sepsis [5].

PRESEPSIN: MARKER FOR NEONATAL SPESIS

Recent literature revealed for the early diagnosis of a soluble cluster differentiation; 14 subtype (s CD14-ST), also termed as presepsin has been identified as potential biomarker for the sepsis. Presepsin is the fragment of the N-terminal sequence of the CD14, and it lacks the lipopolysaccharide binding ability. Studies revealed that the level of the presepsin increases in cases of bacterial infections and sepsis. Zhang *et al*. performed meta-analysis of the accuracy of the presepsin in the diagnosis of sepsis in adults and found that it has a good diagnostic accuracy for the detection of sepsis [6]. A study conducted by Seliem has evaluated the presepsin level in the in preterm infants and found that high expression of presepsin has been associated with the early onset of neonatal sepsis and could be used as a predictor for occurrence of early onset of sepsis [7]. The presepsin has an ability to discriminate between the infectious and non-infectious inflammatory conditions

compared to other makers [8]. Several other studies evaluated and confirmed that the level of presepsin increases in the cases of neonatal sepsis [9–11]. Studies also proved that presepsin has an ability to diagnose the late onset neonatal sepsis and treatment response [12].

Reliable reference values are needed for the determination of a marker to be useful in the sepsis. A study conducted by Pungi *et al*. established the reference ranges for the presepsin in term and preterm neonates with clinical signs of infection. In term infants, presepsin median value was 603.5 pg/ml and in preterm infants, presepsin median value was slightly higher, equal to 620 pg/ml and the values are much higher compared to that of healthy adults [12].

Meta-analysis has been evaluated for different markers including CRP, procalcitonin and presepsin for the diagnostic accuracy in sepsis and found that presepsin is more accurate in predicting the sepsis [13]. Indian studies also focused on the application of the presepsin in diagnosis of the neonatal sepsis. A study conducted by Sharma *et al*. has concluded that during the clinical and biochemical dilemma for detecting the neonatal sepsis, the presepsin level will be a valuable marker in identifying the neonatal sepsis, which in-turn will help in decreasing the over usage of antibiotics [14].

CONCLUSION

To conclude, the presepsin has an ability to differentiate the sepsis and non-infectious inflammatory response. It has a potential to identify the early onset of the neonatal sepsis and will be one of the promising markers, helping in treatment and management of the neonates with sepsis. Further studies are warranted to establish it as routine diagnostic marker for detection of neonate sepsis.

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Cite this Article
Guru Prasad Manderwad, Raj Kumar HRV. Presepsin: A Novel Marker for the Neonatal Sepsis: A Brief Review. *Research & Reviews: A Journal of Microbiology and Virology*. 2018; 8(1): 22–24p.

