

# **Serum pro-hepcidin Levels in Term and Preterm Newborns with Sepsis**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَأَنْزَلَ اللَّهُ عَلَيْكَ  
الْكِتَابَ وَالْحِكْمَةَ  
وَعَلَّمَكَ مَا لَمْ تَكُنْ  
تَعْلَمُ وَكَانَ فَضْلُ  
اللَّهِ عَلَيْكَ عَظِيمًا

صِرَافُ اللَّهِ الْعَظِيمِ □

سورة النساء الآية (١١٢) □



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*✍ Mohamed Bahlol Mohamed Abd- Ellatif*

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*List of Abbreviations*

<b>ACD</b> .....	Anemia of chronic disease
<b>ALI</b> .....	acute lung injury
<b>ANC</b> .....	absolute neutrophil count
<b>ANOVA</b> .....	A one-way analysis of variance
<b>BPD</b> .....	broncho-pulmonary dysplasia
<b>CBC</b> .....	Complete blood count
<b>CDC</b> .....	Centers for Disease Control
<b>CHr</b> .....	hemoglobin content
<b>CONS</b> .....	Commensal organisms such as coagulase-negative staphylococci
<b>CRP</b> .....	C reactive protein
<b>ELISA</b> .....	enzyme-linked immunosorbent assay
<b>EOS</b> .....	Early-Onset Sepsis
<b>ESAs</b> .....	erythropoiesis-stimulating agents
<b>FID</b> .....	Functional iron deficiency
<b>GBS</b> .....	group B Streptococcus
<b>HH</b> .....	hereditary hemochromatosis
<b>HYPO</b> .....	hypochromic red blood cells
<b>IAP</b> .....	intrapartum antibiotic prophylaxis
<b>IL-6</b> .....	interleukin 6
<b>IVIG</b> .....	Intravenous Immunoglobulin
<b>JAK2</b> .....	Janus kinase 2
<b>LEAP</b> .....	liver-expressed antimicrobial peptide
<b>LOS</b> .....	Late-Onset Sepsis
<b>LOS</b> .....	Late-Onset Sepsis

***List of Abbreviations (Cont...)***

<b>MCV</b>	.....	mean corpuscular volume
<b>NE</b>	.....	Necrotizing enterocolitis
<b>NICHD</b>	.....	National Institute of Child Health and Human Development
<b>NS</b>	.....	Neonatal sepsis
<b>PCT</b>	.....	procalcitonin
<b>SDA</b>	.....	Sabouraud's dextrose agar plat
<b>SIRS</b>	.....	Systemic inflammatory response syndrome
<b>SPSS</b>	.....	Statistical Package for Social Sciences
<b>TGF-<math>\beta</math></b>	.....	transforming growth factor- $\beta$
<b>TNF</b>	.....	tumor necrosis factor
<b>TNF-a</b>	.....	tumor necrosis factor
<b>TTN</b>	.....	Transient tachypnea of the newborn
<b>UTIs</b>	.....	urinary tract infections
<b>X<sup>2</sup></b>	.....	Chi-square

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## INTRODUCTION

Neonatal sepsis may be categorized as early or late onset. Eighty-five percent of newborns with early-onset infection present within 24 hours, 5% present at 24-48 hours, and a smaller percentage of patients present within 48-72 hours. Onset is most rapid in premature neonates. Late-onset sepsis syndrome occurs at 4-90 days of life and is acquired from the caregiving environment (*Klinger et al., 2009*).

The continuing unresolved debate over the interaction of iron and infection indicates a need for quantitative review of clinical morbidity outcomes. Iron deficiency is associated with reversible abnormalities of immune function, but it is difficult to demonstrate the severity and relevance of these in observational studies. Iron treatment has been associated with acute exacerbations of infection (*van de Loggen et al., 2009*).

Low serum iron level (hypoferremia) is a common response to systemic infections on generalized inflammatory disorders, developmental hypoferremia during inflammation requires hepcidin (*Nemeth et al., 2004*).

Serum pro-hepcidin is a defensin-like antimicrobial peptide, hepcidin, is part of the innate immune system and thus constitutes the first-line defense against infections. *In vivo* and *in vitro* studies have demonstrated that hepcidin is active against Gram-positive

and Gram-negative bacteria as well as yeasts. In addition to its antimicrobial activity, it acts as an iron regulatory hormone that negatively regulates intestinal iron absorption and macrophage iron release. Thus, hepcidin acts in two ways against bacteria: it reduces the amount of iron available for pathogens and it attacks them directly (*Malyszko and Mysliwiec, 2007*).

## **AIM OF THE STUDY**

**T**he aim of the present study is to determine serum levels of pro-hepcidin using ELISA in full-term and preterm newborns with sepsis and to determine the possible relationships between pro-hepcidin levels and serum iron and complete blood count.