

Diagnostic and Prognostic Value of Serum Apelin in Early Onset Neonatal Sepsis

Thesis

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List of Abbreviations

ACTH	: Adrenocorticotrophic hormone
ADH	: Antidiuretic hormone
ANC	: Absolute neutrophil count
Apelin-LI	: Apelin like immunoreactivity
APJ	: Apelin receptor
APPs	: Antimicrobial proteins and peptides
AVP	: Arginine-vasopressin
BBB	: Blood–brain barrier
CDC	: Center for Disease Control and prevention
CHD	: Coronary heart diseases
CMV	: Cytomegalovirus
CNS	: Central nervous system
CONS	: Coagulase-negative staphylococcus
CORTICUS	: Corticosteroid therapy of septic shock
CRH	: Corticotrophin-releasing hormone
CRIB	: Clinical Risk Index for Babies
CRP	: C-reactive protein (CRP)
CSF	: Cerebrospinal fluid
CVOs	: Circumventricular organs
DCM	: Dilated cardiomyopathy
DIC	: Disseminated intravascular coagulation
EOS	: Early onset sepsis
ESR	: Erythrocyte sedimentation rate
FFP	: Fresh frozen plasma
FIZZ	: Found in inflammatory zones
GBS	: Group B streptococcus
G-CSF	: Granulocyte Colony Stimulating Factor
GD	: Gestational diabetes
GM-CSF	: Granulocyte-Macrophage Colony Stimulating Factor
HCWs	: Healthcare workers
HIV	: Human immunodeficiency virus
HNS	: Hypothalamic–neurohypophysial system

HPA	: Hypothalamo-pituitary-adrenal
HRC index	: Heart rate characteristics index
HSS	: Hematological scoring system
HSV	: Herpes simplex virus
I:T	: Immature to total neutrophil
IVH	: Intraventricular hemorrhage
IVIG	: Intravenous gammaglobulin
LOS	: Late onset sepsis
MABP	: Mean arterial blood pressure
MRSA	: Methicillin-resistant <i>S. aureus</i>
NEC	: Necrotising enterocolitis
NICU	: Neonatal intensive care unit
NK	: Natural killer
NO	: Nitric oxide
PBEF	: Pre-B-colony enhancing factor
PCR	: The polymerase chain reaction
PMNL	: Polymorphonuclear leucocytes (PMNL)
PRBC	: Packed Red Blood Cells
PROM	: Premature rupture of membranes
PT	: Prothrombin time
PTT	: Partial thromboplastin time
PVN	: Paraventricular nucleus
RDS	: Respiratory distress syndrome
RELMs	: Resistin-like molecules
SIRS	: Systemic inflammatory response syndrome
SIV	: Simian immunodeficiency virus
SNAP	: Score for Neonatal Acute Physiology
UTI	: Urinary tract infection
VLBW	: Very low birth weight
WAT	: White adipose tissue
WBC	: White blood cell count

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Introduction

Sepsis is a significant cause of morbidity and mortality in the newborn, particularly in preterm, low birth weight infants, despite advances in neonatal care, overall case-fatality rates from sepsis range from 2% to as high as 50% (*Bizzarro et al., 2009*).

Despite extensive investigation, no single test meets the criteria that would make it an ideal marker for early diagnosis of sepsis in the newborn. Generally, screening includes a complete blood count with differential and may be accompanied by other adjuvant tests such as a C-reactive protein (CRP) (*Hawak, 2004*).

Neonatal blood culture positive rate have been found to range from 20-50% (*Kayange et al., 2010*).

Apelin is a novel bioactive peptide identified as the endogenous ligand of the orphan G protein-coupled receptor. Cardiovascular system appears to be a primary target of apelin because blood pressure decreases and heart rate increase after IV administration of apelin in rats. Apelin also exerts a positive inotropic effect in rats. Moreover, dramatic changes of apelin and apelin receptor (APJ) expression have been found in human heart with cardiac dysfunction (*Boucher et al., 2009*).

Immunolocalization of apelin and its receptor have been identified in brain, including in the hypothalamus. This is in agreement with a potential role of apelin in the control of pituitary hormone release, body fluid equilibrium, and drinking behaviour. A modest, although unclear role in the control of food intake has been described (*Boucher et al.*, 2009).

Apelin and other adipocytokines may be associated with inflammation and its clinical consequences (*Malyszko et al.*, 2009).

Serum apelin level changes in patients with severe sepsis and septic shock, which may provide clues in diagnosis and prognosis (*Chen et al.*, 2009), although it has not yet been investigated in neonatal sepsis.