DIAGNOSTIC AND PROGNOSTIC VALUE OF SERUM LEPTIN LEVEL IN CRITICALLY ILL PEDIATRIC PATIENTS WITH SEPSIS

Thesis

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بسم الله الرحمن الرحيم

"قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا
إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ"

صدق الله العظيم

سورة البقرة الآية (32)

DEDICATION

My heartily thanks and deepest gratitude to all my family, especially to my kindhearted mother and lovely husband for their support, understanding and tolerance all the time till this work was completed

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Heba Mostafa

LIST OF ABBREVIATIONS

ACCM	American College of Critical Care Medicine
ACTH	Adreno cortical hormone
ALT	Alanine aminotransferase
ANC	Absolute neutrophil count
APTT	Activated Partial Thromboplastin time
AST	Aspartate aminotransferase
ARC	Arcuate nucleus
BMN	Bone mineral density
BUN	Blood urea nitrogen
Ca	Serum calcium
CBC	Complete blood count
CCK	Cholecystokinin
CNS	Central Nervous System
Creat.	Creatinine
CRP	C-.reactive protein
CSF	CerebroSpinal Fluid
CVVH	Continuous Venovenous Haemofiltration
DBP	Diastolic blood pressure
DIC	Disseminated Intravascular Coagulation
DVT	Deep Venous Thrombosis
ECMO	Extra Coporeal Membrane Oxygenation
FDP	Fibrinogen degradation products
FiO2	Fraction of inspired oxygen
GCS	Glasgow coma score
GFR	Glomerular filtration rate
GH	Growth hormone
Hb	Hemoglobin
Hib	Hemophilus influenzae type b
HS	High Significant
HR	Heart Rate

ICU	Intensive care unit
IFN	Interferon
IL	Interleukins
INR	International normalized Ratio
K	Serum potassium
MAP	Mean arterial pressure
MIP_1α	Macrophage inflammatory protien-1-alpha
MODS	Multiple organ dysfunction syndrome
MV	Mechanical Ventilation
n	Number
NK	Natural killer cells
N meningitides	Neisseria meningitides
NP (CPAP)	Nasopharyngeal CPAP
NPY	Neuropeptide Y
Na	Serum sodium
NS	Non Significant
P	Probability
P_aCO_2	Partial arterial carbon dioxide
PaO2	Partial arterial Oxygen
PALS	Pediatric Advanced Life Support
PGI_2	Prostacyclin
PICU	Pediatric Intensive Care Unit
Plat	Platelet count
PAF	platelet activating factor
PIM II	Predicted Index of Mortality
PMNL	Polymorphnuclear leukocytes
PT	Prothrombin Time
PVN	Para ventricular nucleus
ROC	Receiver Operating Characteristic
S pneumoniae	Streptococcus pneumoniae
S	Significant
S. Creat.	Serum Creatinine
SBP	Systolic Blood Pressure

SD	Standard Deviation
Sig	Significance
SIRS	Systemic Inflammatory Response Syndrome
SpeA	Streptococcal pyrogenic exotoxin A
Std. Deviation	Standard Deviation
SVO_2	Mixed Venous Oxygen saturation
SU	Stress Ulcer
Temp	Temperature
TLC	Total Leucocytic Count
TNF	Tumor Necrosis Factor
TXA_2	Thromboxan A_2
TSST	Toxic Shock Syndrome Toxin
RR	Respiratory rate
VAP	Ventilator associated pnemonia
Vs	Versus
WBC	White Blood Cell

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES

LIST OF CONTENTS

INTRODUCTION

Sepsis is a systemic inflammatory reaction that is triggered by an infective agent (such as bacteria, viruses, fungi or parasites) ***(Monneret G ,2010)***, It is one of the major health concerns worldwide and also the predominant reason for intensive care unit (ICU) admission ***(Arabi Y et al., 2003)***, With the rapidly increasing incidence, high mortality rates, complex pathophysiology and overall difficulties in its treatment, sepsis is becoming an important focus for researchers and clinicians ***(Martin GS, 2012)***.

Infections and sepsis are accompanied by clinical signs such as leukocytosis, changes in body temperature and the development of tachycardia. However, these classic indicators of systemic inflammation are neither sensitive nor specific for sepsis ***(Fried E et al., 2011)***. They have only moderate sensitivity and specificity and are not early markers due to the time taken to produce a reaction. Therefore, early markers are useful for the diagnosis and treatment of sepsis and are crucial for overcoming sepsis-associated mortality.

Cytokine levels are an obvious choice as a marker of sepsis. The systemic release of inflammatory cytokines occurs several hours prior to other markers of systemic inflammation, such as acute phase protein release and leucocytosis, suggesting their potential importance as diagnostic parameters in systemic inflammatory response syndrome (SIRS) and sepsis (***Andaluz-Ojeda D et al., 2012)***. When sepsis occurs, multiple redundant inflammatory cytokines are released into the blood stream, including tumor necrosis factor-α (TNF-α), interleukin-6 (IL-6), leptin, C-reactive protein (CRP) and procalcitonin (PCT) ***(Song R et al., 2012)***, which are important for mediating the inflammatory response.

The hormone leptin (molecular weight of 16-kDa) is mainly generated by adipocytes and contributes to the regulation of energy balance by informing the brain of the volume of adipose tissue in the body, thereby regulating food intake and energy expenditure ***(Hoda MR et al., 2012)***, Leptin also regulates endocrine and immune function. It plays a role in innate and acquired immunity. Both the structure of leptin and that of its receptor suggest that leptin can be classified as a cytokine ***(Margalet VS et al., 2010).***

AIM OF THE WORK

Evaluation of the role of serum leptin level in early diagnosis of sepsis in critically ill patients and its possible prognostic value.

Sepsis in Critically ill Children

Introduction:

Sepsis remains a major clinical problem as it affects many patients. Moreover, sepsis is a major cause of death in the intensive care units (ICUS) worldwide and uses a large amount of hospital resources ***(Butt, 2001).***

Despite advances in the supporting care, severe sepsis carries a high mortality rate ranging from 30%-50% in adults. Whereas in children, It is estimated at between 10% and 20% ***(Pastores, 2004).***