



بسم الله الرحمن الرحيم

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Frequency of Non-Thyroidal Illness Syndrome in Pediatric Patients with Sepsis and Septic Shock

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالَ

سَبَّحَانَكَ لَا إِلَهَ إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
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Dedication

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List of Abbreviations

Abb.	Full term
ALT.....	Alanine aminotransferase
ARDS.....	Acute respiratory distress syndrome
AST.....	Aspartate aminotransferase
AUC.....	Area under curve
CBC.....	Complete blood count
CRP.....	C-reactive protein
DVT.....	Deep vein thrombosis
ECMO.....	Extracorporeal membrane oxygenation
ELISA.....	Enzyme Linked Immunosorbent Assay
ESS.....	Euthyroid Sick Syndrome
FiO2.....	Fraction of inspired oxygen
FT3.....	Free triiodothyronine
FT4.....	Free Thyroxine
GRV.....	Gastric residual volumes
HB.....	Hemoglobin level
HBP.....	Heparin binding protein
HIV.....	Human immunodeficiency virus
IL6.....	Interleukin 6
iNO.....	Nitric Oxide, Inhalational
IVIG.....	Intravenous immune globulin
LPS.....	Lipopolysaccharide
LT3.....	Liothyronine
LT4.....	Levothyroxine
MAP.....	Mean arterial pressure

List of Abbreviations Cont...

Abb.	Full term
MCP.....	Monocyte chemoattractant protein
MCT.....	Monocarboxylate transporter
mRNA.....	Messenger RNA
NEFA.....	Non-Esterified Fatty Acids
NF κ B	Nuclear factor kappa B
NIS.....	Na-iodine symporter
NTIS	Nonthyroidal illness syndrome
NTIS	Non-Thyroidal Illness Syndrome
OATP1C1	Organic anion-transporting polypeptide 1C1
PaCO ₂	Partial pressure of carbon dioxide
PaO ₂	Partial pressure of oxygen
PaO ₂ /fiO ₂	Partial pressure of oxygen to fractional oxygen content
PARDS.....	Pediatric acute respiratory distress syndrome
PCT.....	Procalcitonin
PEEP	Positive end-expiratory pressure
PICU.....	Pediatric intensive care unit
PLT	Platelet
pSOFA.....	Pediatric sequential sepsis related organ failure assessment score
ROC	Receiver operating characteristic curve
rT ₃	Reverse T ₃
sIL-2R.....	Soluble interleukin-2 receptor
SOFA score.....	Sequential Organ Failure Assessment score

List of Abbreviations Cont...

Abb.	Full term
Spo2	Peripheral arterial oxygen saturation
TAMOF.....	Thrombocytopenia-associated multiple organ failure
TBG	Thyroid-binding globulin
TLC.....	Total Leucocytic count
TNF- α	Tumor necrosis factor- α
TPO.....	Thyroid peroxidase
TSH.....	Thyroid stimulating hormone
VA.....	Veno-arterial
VBG	Venous blood gases
VDD	Vitamin D deficiency
VV	Veno-venous

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INTRODUCTION

Sepsis is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection and "septic shock" the subset of sepsis with circulatory an cellular/metabolic dysfunction associated with a higher risk of mortality (*Weiss et al., 2020*), Determination of an acute prognosis in the early stage of sepsis and septic shock is of great importance to aid in the development of adapted strategies and improve patient outcomes(*Investigators, 2017*). Many studies have been devoted to biomarkers and clinical scores that could evaluate the severity and prognosis of patients with septic shock; however, none of them are widely used clinically(*Liu et al., 2019*). Thus, new biomarkers for reliable early prognosis are still urgently needed.

Pediatric Patients suffering from critical illnesses who require treatment in pediatric intensive care unit (PICU) present with alterations in circulating thyroid hormone levels that are referred to with several names such as Non-Thyroidal Illness Syndrome (NTIS), Euthyroid Sick Syndrome (ESS) also known as the low T3 syndrome. NTIS demonstrate abnormal thyroid functions (low serum FT3 and TT3, high rT3, normal or mildly increased FT4 and TT4, and normal or low TSH concentrations. In severe cases, the TT4 and FT4 concentrations might be low and that of TSH normal) (*Feng et al., 2020; Langouche et al., 2019*).