



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



HANAA ALY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Mean Platelet Volume VS C-Reactive Protein as a Prognostic Marker in Sepsis in ICU

Thesis

*Submitted for Partial Fulfillment of Master Degree in
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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العظيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

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List of Abbreviations

Abb.	Full term
<i>AKI</i>	<i>Acute Kidney Injury</i>
<i>APACHE</i>	<i>Acute Physiology, Age and Chronic Health Evaluation</i>
<i>ARDS</i>	<i>Acute Respiratory Distress Syndrome</i>
<i>CRP</i>	<i>C-Reactive Protein</i>
<i>DASH</i>	<i>Dietary Approaches to Stop Hypertension</i>
<i>DIC</i>	<i>Disseminated Intravascular Coagulation</i>
<i>EDTA</i>	<i>Ethylene Diamine Tetra Acetic Acid</i>
<i>EGDT</i>	<i>Early Goal-Directed Therapy</i>
<i>GCS</i>	<i>Glasgow Coma Score</i>
<i>GWAS</i>	<i>Genome-Wide Association Studies</i>
<i>HRT</i>	<i>Hormone Replacement Therapy</i>
<i>ICU</i>	<i>Intensive Care Unit</i>
<i>LPS</i>	<i>Lipopolysaccharide</i>
<i>MAP</i>	<i>Mean Arterial Pressure</i>
<i>MPM</i>	<i>Mortality Probability Model</i>
<i>MPV</i>	<i>Mean Platelet Volume</i>
<i>Na+</i>	<i>Sodium</i>
<i>NO</i>	<i>Nitric Oxide</i>
<i>OR</i>	<i>Odds Ratio</i>
<i>oxLDLs</i>	<i>Oxidized Low-Density Lipoproteins</i>
<i>PCh</i>	<i>Phosphocholine</i>
<i>PDW</i>	<i>Platelet distribution width</i>
<i>PheWAS</i>	<i>Phenome-Wide Association Studies</i>

List of Abbreviations (*Cont...*)

Abb.	Full term
<i>PHT</i>	<i>Prehypertension</i>
<i>PPV</i>	<i>Pulse-Pressure Variation</i>
<i>RR</i>	<i>Respiratory Rate</i>
<i>SAPS</i>	<i>Simplified Acute Physiology Score</i>
<i>SOFA</i>	<i>Sequential Organ Failure Assessment</i>
<i>WES</i>	<i>Whole Exome Sequencing</i>
<i>WGS</i>	<i>Whole Genome Sequencing</i>

INTRODUCTION

Sepsis was first mentioned in Homer's poems around 2,700 years ago. The word "sepsis" comes from the word (sipsi), which in original Greek means decomposition of organic matter. During the late 19th and the 20th centuries, sepsis was described as a systemic infection supposedly caused by the invasion of the blood stream by pathogenic microorganisms. However, patients still died of sepsis even when the microorganisms had been eradicated with antibiotics (*Majno, 1991*).

Sepsis and septic shock are major healthcare problems, affecting millions of people around the world each year and killing as many as one in four and often more (*Angus et al., 2001*).

Similar to polytrauma, acute myocardial infarction, or stroke, early identification and appropriate management in the initial hours after sepsis develops improved outcomes (*Dellinger et al., 2013*).

C-reactive protein (CRP) is a liver-derived plasma protein; its concentration significantly increases in inflammatory processes in response to IL-6. CRP aggregates with damaged cells, apoptosis fragments, and bacterial, fungal (*Pepys and Hirschfield, 2003*).

Mean platelet volume (MPV) describes the average size of platelets in a blood sample and routinely measured by automated hematology analyzers using either electrical

impedance or optical fluorescence method (*Jackson and Carter, 1993*). A rise in MPV during sepsis caused by increased platelet destruction and increased production of larger mean platelet volume and younger platelets (*Warkentin et al., 2003*).

Increased platelet volume and size reflects the existence of athrombotic and inflammatory milieu; thus, MPV is suggested as a possible marker of platelet function and activation (*Colkesen et al., 2012*).

Additionally, MPV has been considered an index for inflammation, disease activity, and efficacy of anti-inflammatory treatment in several chronic inflammatory disorders, such as inflammatory bowel disease, rheumatoid arthritis, and ankylosing spondyloarthritis (*Yazici et al., 2010*).

The time course of platelet counts and its function in critically ill patients, especially in patients with sepsis, have been elucidated by several previous studies (*Akca et al., 2002*).

There is a strong relation between MPV and prognosis described by medical researchers, so an increase in platelet size in a patient with bacterial infection could suggest that the infection has become invasive (*Jones et al., 2009*).

AIM OF THE WORK

This study aims to correlate between the mean platelet volume in patients with sepsis with C-reactive protein as a prognostic markers.

Chapter 1

SEPSIS

Sepsis definitions

Sepsis as a process of rotting flesh, and recently, it has been defined as life-threatening organ dysfunction resulting from infection (*Reinhart et al., 2017*).

Despite best efforts at protocol-based care pathways, mortality from septic shock remains high at nearly 35% to 40% (*Vincent et al., 2019*).

Sepsis was first mentioned in Homer's poems around 2,700 years ago. The word "sepsis" comes from the word σῆψις, (sipsi), which in original Greek means decomposition of organic matter. During the late 19th and the 20th centuries, sepsis was described as a systemic infection supposedly caused by the invasion of the blood stream by pathogenic microorganisms. However, patients still died of sepsis even when the microorganisms had been eradicated with antibiotics (*Majno, 1991*).

Sepsis-1: Systemic Inflammatory Response Syndrome Criteria

The term "sepsis" had been used broadly for decades; however, it had been associated with multiple definitions, and the term had been loosely applied to many syndromes. In an