CD_{14} as a marker in septic shock

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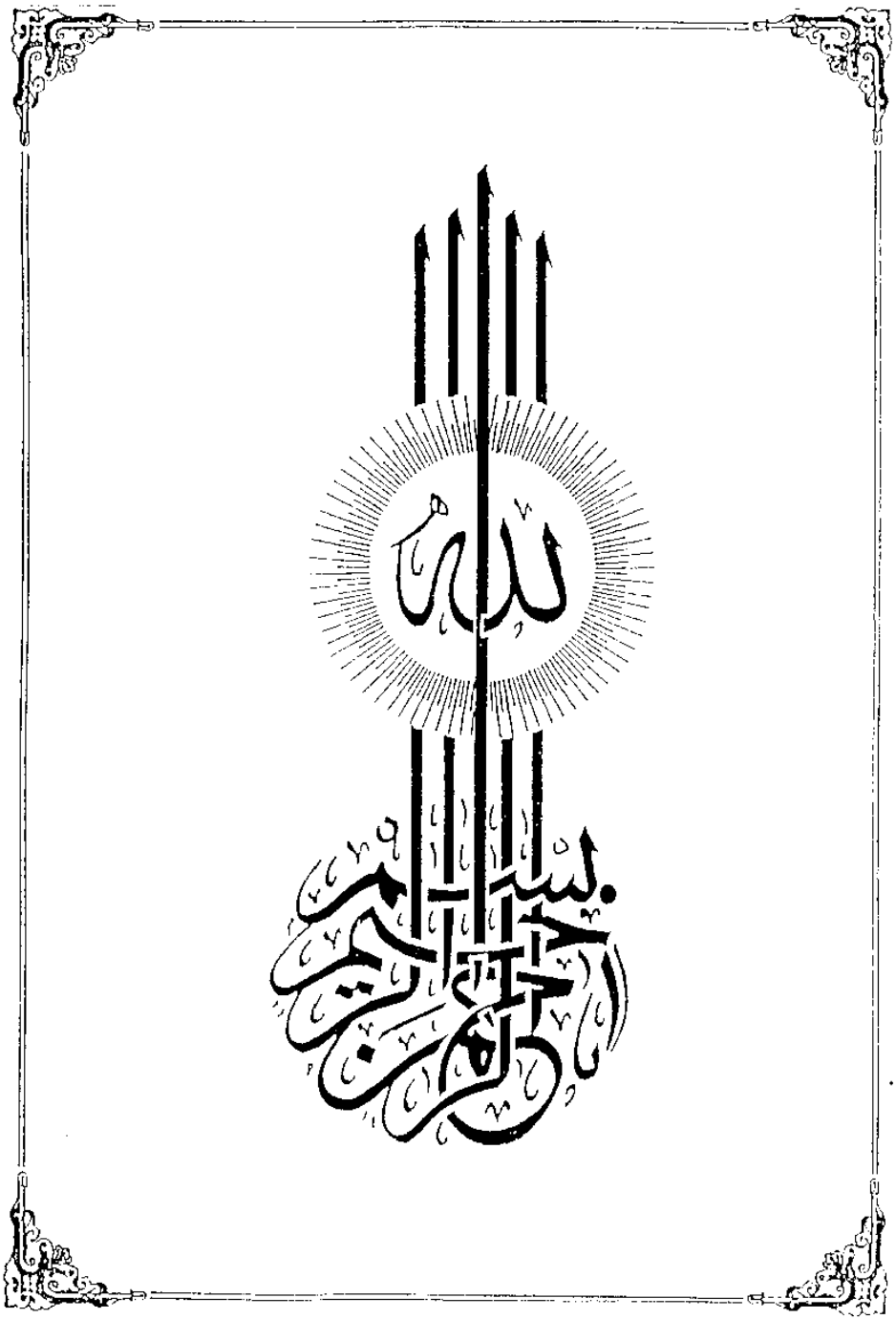
بسم الله الرحمن الرحيم

"رب اشرح لي صدري،
ويسر لي أمري،
واحلل عقدةً من لساني،
يفقهوا قولي"

صدق الله العظيم



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Abstract

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Title: CD14 as a marker in septic shock.

Place of research: Faculty of Medicine, Ain- Shams University.

Abstract: To investigate the role of CD14 receptor in the pathogenesis of septicemia and septic shock, a study was done on 40 patients suffering from septicemia, 20 of them had gram-negative septicemia [Klebsiellla 8(40%), Pseudomonas 8(40%) and E-coli 4(20%)] and 20 had gram-positive septicemia [Staph. aureus 10(50%), Coagulase- negative staph. 6(30%) and α-hemolytic strept 4(20%)]. 11 of them developed septic shock. Whole blood was obtained from patients for blood culture by Oxoid signal system and upon isolation of organisms, another whole blood sample on EDTA was obtained from patients and compared with 20 normal controls and subjected to flow cytometric analysis of the intensity of CD14 expression on monocytes. Statistical analysis of the results showed that there is a significant down- modulation of CD14 receptor associated with septicemia and septic shock. This down-modulation expressed in gram- negative septicemia more than gram-positive septicemia with higher mortality, so that, CD14 receptor may be a significant marker in septicemia and septic shock.

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List of Abbreviations

LPS	Lipopolysaccharide.
LBP	Lipopolysaccharide Binding Protein.
GPI	Glycosyl Phosphatidyl Inositol.
SPS	Sodium Polyanethole Sulfonate.
BHI	Brain Heart Infusion broth.
mCD14	membrane CD14.
SCD14	Soluble CD14.
EDTA	Ethylene Diamine Tetra Acetic Acid.
KDa	Kilo Dalton.

Introduction:

Septic shock caused by a diverse group of bacterial pathogens is a serious human disease. Recognition of bacterial envelope constituents is one mechanism used by mammalian cells to initiate responses leading to bacterial killing or, un fortunately, responses that also cause fatal septic shock ***(Pugin etal., 1994).***

Lipopolysaccharide, an essential outer membrane glycolipid of gram- negative bacteria is a potent inducer of inflammation and is involved in the pathogenesis of septic chock ***(Rietschel and Brade, 1992).*** Lipid A represents the biologically active principle and is structurally conserved among different types of lipopolysaccharides ***(Rietschel etal., 1994).***

Lipopolysaccharide- activated mononuclear phagocytes release mediators such as, interleukin 1, interleukin 6 and tumour necrosis factor α ***(Loppnow etal., 1990).*** This activation requires recognition of lipopolysaccharides at the cell surface and trans-membrane signalling. So far, several cellular proteins have been reported to bind lipopolysaccharides or Lipid A ***(Halling etal., 1992).*** However, only membrane- bound CD_{14} has been shown to be involved in the initiation of secretory responses after recognition of lipopolysaccharides which are responsible for septic shock cascade ***(couturier etal, 1992).***

CD_{14} is a glycophosphatidyl inositol- linked membrane protein expressed by macrophages. It plays a key role in initiating cell activation by a group of bacterial envelope components from gram- negative and gram- positive microorganisms and may be crucial in gram- negative septicemia. Thus its level may be of prognostic value in patients with gram- negative septic shock ***(Landmann etal., 1995).***

Aim of the work:

The aim of this work is to study the role of CD_{14} in septic shock and to compare the results according to the etiological agents isolated in blood culture whether gram- positive cocci or gram- negative bacilli.