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STUDY OF PLASMA ANTITHROMBIN III AND PROTEIN C IN EGYPTIAN CHILDREN WITH CHRONIC RENAL FAILURE

THESIS

رسالة

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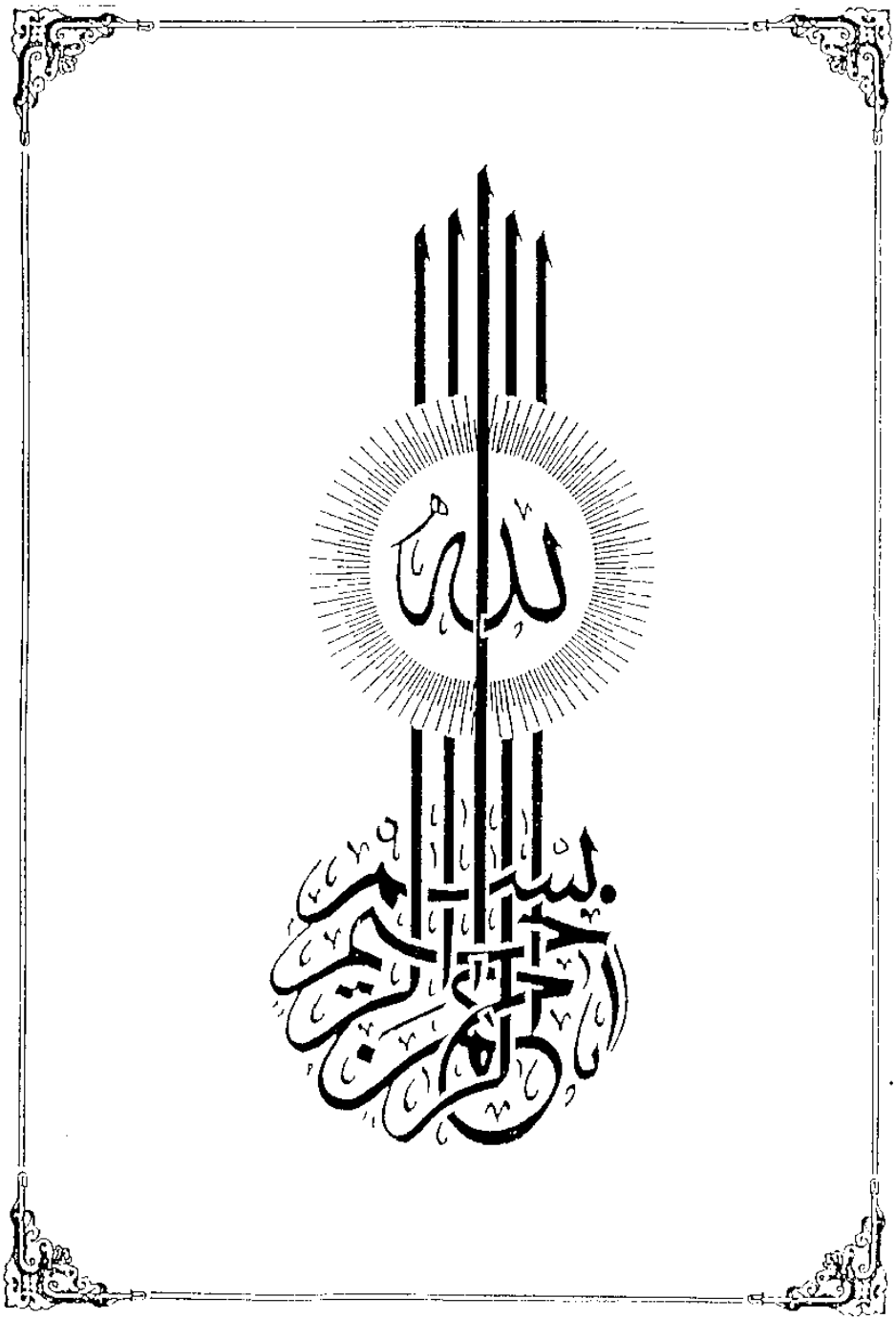
بسم الله الرحمن الرحيم

﴿ قالوا سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم ﴾

صدق الله العظيم

« سورة البقرة ـ آية ٣٢ »



To ...

My Family

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LIST OF ABBREVIATIONS

13-HODE	13-hydroxy octadecadienoic acid
α_2AP	α_2 antiplasmin
Ab	Antibody
ACT	Activated clotting time
ADP	Adenine diphosphate
APS	Anti-phospholipid antibody syndrome
ARF	Acute renal failure
AT III	Anti-thrombin III
ATP	Adenosine triphosphate
AVF	Arteriovenous fistula
AVG	Arteriovenous graft
BTG	B-thromboglobulin
BUN	Blood urea nitrogen
Ca	Calcium
cAMP	Cyclic adenosine monophosphate
CGN	Chronic glomerulonephritis
CRF	Chronic renal failure
DIC	Disseminated intravascular coagulopathy
DVT	Deep venous thrombosis
EDRF	Endothelial-derived relaxing factor
ESRD	End-stage renal disease
FgDP	Fibrinogen degradation products
FnDP	Fibrin degradation products
FPA	Fibrinopeptide A
FPB	Fibrinopeptide B
HAT	Heparin associated thrombocytopenia
Hb	Hemoglobin
HD	Hemodialysis
HS	Heparan sulphate
IC Hge	Intracranial hemorrhage
IgG-ACA	Immunoglobulin anticardiolipin antibody

IX	Christmas factor
LMW	Low molecular weight
LPC	Lysophosphatidyl choline
NS	Nephrotic syndrome
PAF	Platelet-activating factor
PAI	Plasminogen activator inhibitor
PAP	Plasmin α_2 antiplasmin
PC	Protein C
PF1,2	Prothrombin fragments (1+2)
PGI_2	Prostaglandin I_2
PL	Phospholipid
PS	Protein S
PUV	Posterior urethral valve
r-HuEPO	Recombinant human erythropoietin
rt-PA	Recombinant tissue plasminogen activator
SLE	Systemic lupus erythematosus
TAT	Thrombin-antithrombin
TF	Tissue factor
TFPI	Tissue factor pathway inhibitor
t-PA	Tissue plasminogen activator
TXA_2	Thromboxane A_2
u-PA	Urokinase-like plasminogen activator
UTI	Urinary tract infection
V	Labile factor, proaccelerin, accelerator globulin
VII	Stable factor, proconvertin
VIII	Anti-hemophilic globulin (AHG), antihemophilic factor (AHF)
vWF	von Willebrand factor
WBACT	Whole blood activated clotting time
X	Stuart-Prower factor
XI	Plasma thromboplastin antecedent (PTA)
XII	Hageman factor

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Introduction

INTRODUCTION

Patients undergoing hemodialysis (HD) are subjected to a special risk of thrombotic complications (*Lai et al.*, 1991).

There is a high incidence of cerebrovascular accidents leading to a 10 to 20% mortality rate in both adult and pediatric dialysis populations, together with recurrent thrombosis of the vascular accesses that carries the threat of pulmonary embolism (*Brenner and Rector*, 1991).

Latent activation of coagulation has been suggested as the cause of elevated thrombogenic risk among dialysis patients. Besides, certain types of filters are more thrombogenic than others (*Hakim and Schulman*, 1989 and *Schultze et al.*, 1992).

Antithrombin III (AT III) is a plasma glycoprotein synthesized by the liver and probably the vascular endothelial cells (*Bauer and Rosenberg*, 1995). It inhibits thrombin and factors IXa and Xa, its activity is promoted when it binds to heparan sulphate or to heparin (*Ward*, 1995a).

A decrease in plasma AT III during dialysis was reported by some investigators. However, other investigators failed to confirm this observation (*Muller*, 1992).

Protein C (PC) is an important naturally occurring anti-coagulant and fibrinolytic agent, the deficiency of which is associated with a thrombotic diathesis (*Lai et al.*, 1991). Information regarding the effect of hemodialysis on AT III and PC is either controversial (as in AT III) or limited (as in PC).

The D-dimer is the terminal fragment in the degradation of fibrin (*Gaffney et al.,* 1980). The presence of D-dimer in plasma is an indirect marker of a coagulation activation followed by a reactive thrombolysis. In patients with chronic renal failure (CRF) without dialysis, fibrinogen and fibrin degradation products (FgDP, FnDP) were reported to be significantly increased, denoting an activation of fibrinolysis (*Opatrny,* 1997).