PLASMA fibronectin LEVEL IN DIABETES MELLITUS

A THESIS

Presented to

Ain Shams University, The Faculty of Science, Department of Biochemistry.

In Fulfilment for the M.Sc. Degree in Biochemistry.

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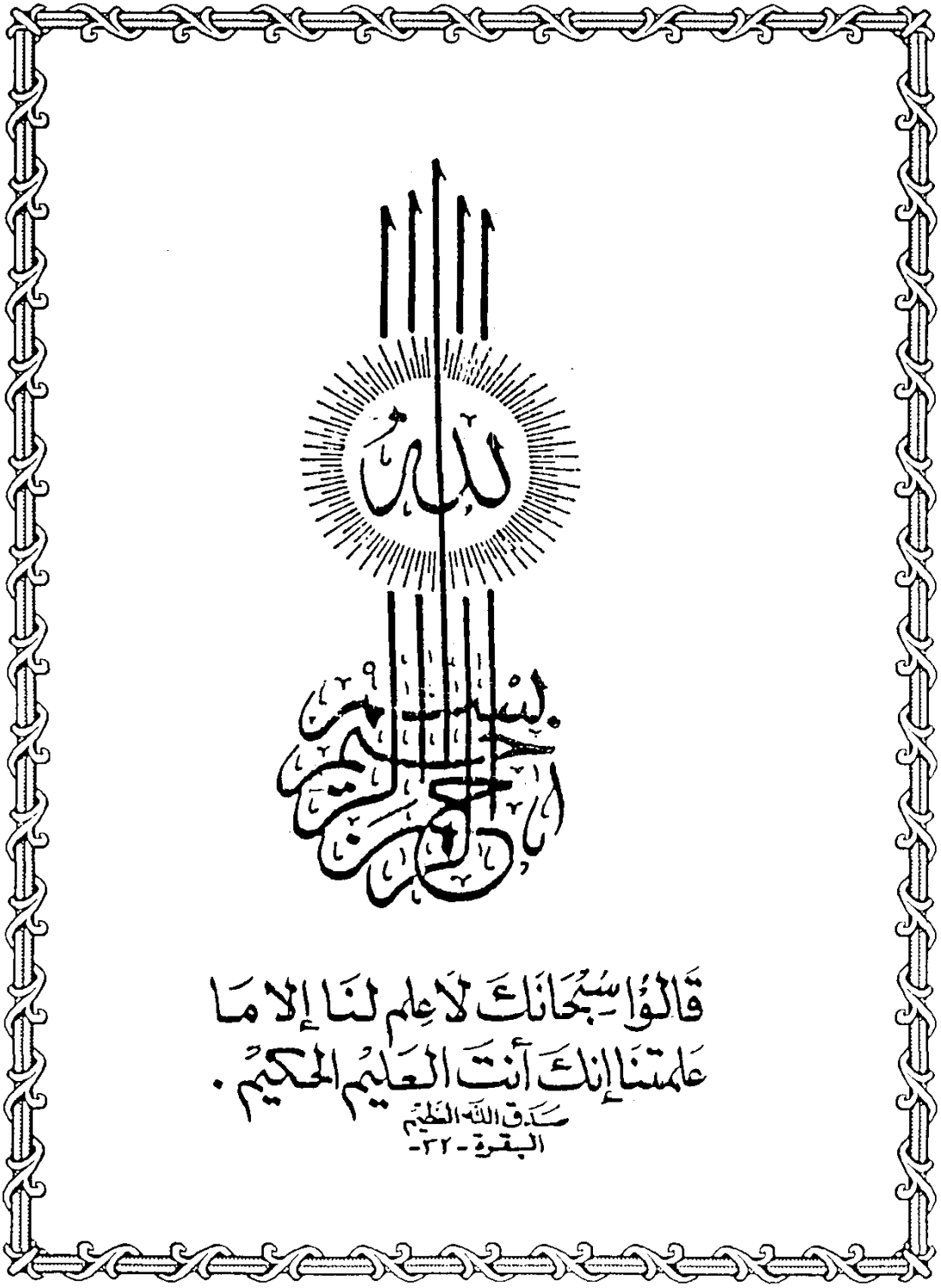
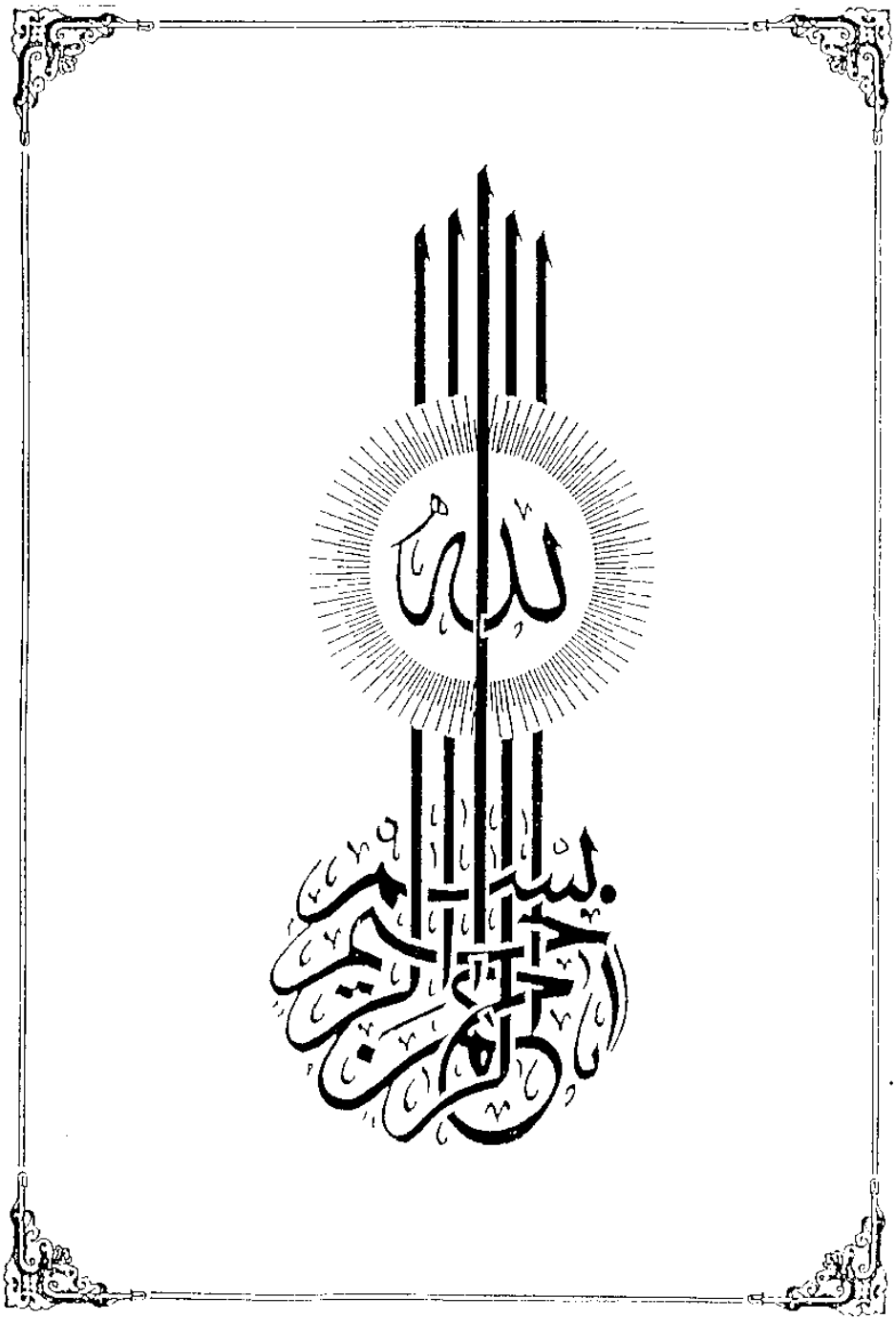
1993





Dedicated to my parents

To my dear parents
For, their love,
encouragement,
and help
have made my studies possible
and to them, I owe everything
thank you

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ACKNOWLEDGEMENT

I would like to express my sincer thanks and deepest gratitude to: ***Professor Dr. EISA AHMED EISA,*** *Professor of Biochemistry, who offered me the encouragement, the generous support and his experience for planning of this work.*

I wish to express my deepest gratitude and many thanks to: ***Dr. MAHMOUD EL-SABBAGH,*** *Ass. Prof. of Biochemistry, who offered me much of his time for providing me with valuable advices, suggestions and useful criticisms. I am deeply thank him for kind supervision during this study.*

My deep greatful and thanks to: ***Dr. HAZEM HASSAN EL-KHALIGI,*** *Ass. Prof. of Clinical Pathology and Hematology, who gave me the subject of this thesis, and helped me in fulfilling the practical part of this work.*

My deep gratitude to: ***Professor Dr. MEHMED ABD EL-FATAH.*** *The head of the department of Biochemistry for his facilities during this study.*

I wish also to thank ***"General Health Insurance Organization"*** *which gave me the chance for undergoing this work.*

Thanks for all.

LIST OF ABBREVIATIONS

Ab	: Antibody.
ADP	: Adenosine diphosphate.
ATP	: Adenosine triphosphate.
Ca	: Calcium.
Cmm	: Cubic millimeter.
Conc.	: Concentration.
DM	: Diabetes mellitus.
DNA	: Deoxy ribonucleic acid.
EDTA	: Ethylene diamine tetra acetic acid.
F	: Fasting.
FDP	: Fibrin degradation products.
FN	: Fibronectin.
GDM	: Gestational Diabetes mellitus.
GL	: Glucose.
9/1	: gram per liter.
GOD	: Glucose oxidase.
GOD-PAP	: 4-aminophenazone glucose oxidase peroxidase.
HIV	: Human immunodeficiency virus.
HLA	: Human Leucocyte antigen.
5-HT	: 5-Hydroxy tryptamine.
I	: Iodine.
IDDM	: Insulin dependent Diabetes mellitus.
IGT	: Impaired glucose tolerance.
JOD	: Juvenile Onset Diabetes.
Kd	: Kilo dalton.

MB	:	Maximum binding.
mg/dl	:	milligram per deciliter.
mg/l	:	milligram per liter.
ml	:	milliliter.
mm	:	millimeter.
MOD	:	Maturity-Onset Diabetes.
MRDM	:	Malnutrition-Related Diabetes mellitus.
NIDDM	:	Non Insulin dependent Diabetes mellitus.
nm	:	nanometer.
N.S.	:	Non-significant.
N.S.B.	:	Non-specific binding.
n.v.	:	normal value.
P	:	Probability.
PAI	:	Plasminogen activator inhibitor.
PICA	:	Pancreatic islet cell antibodies.
POD	:	Peroxidase.
PP	:	Post prandial.
PT	:	Prothrombin time.
PTT	:	Partial thromboplastin time.
rpm	:	Rotation per minute.
S	:	Svedberg sedimentation coefficient.
SD	:	Standard deviation.
SDS	:	Sodium dodecyle sulfate.
SE	:	Standard error.
Sec	:	Second.
t-PA	:	tissue-Plasminogen activator.

µg	:	micro gram.
µIU/ml	:	micro International Unit per milli liter.
ul	:	micro liter.
µMol/l	:	micro mol per liter.
v-WF	:	von-Willebrand Factor.
WHO	:	World Health Organization.
WHO-NDDG	:	Worl Health Organization-National Diabetes Data Group.

Abbreviations according to:

- Varley, et al. (1980).
- WHO-NDDG (1979).

CHAPTER (1)

INTRODUCTION

INTRODUCTION AND AIM OF THE WORK

"Plasma fibronectin level in Diabetes mellitus"

fibronectin is a group of closely related proteins (glycoproteins) that found in blood, body fluids and tissue extracellular matrices (McKeown-Longo, 1987).

fibronectin has not been associated with a disease or a deficiency syndrome, so the researches concerning that passed very slowly.

Hoffbrand (1987) reported that, the changes in fibronectin and its physiological and pathological functions are not well understood, although it has an important role in wound healing and tissue repair.

The statement which mentioned by Hoffbrand (1987) about the important role of fibronectin in wound healing and tissue repair necessitate the study of its biochemical and pathological functions in the body.

Diabetes mellitus is a heterogenous primary disorder of general metabolism (Anderson, 1985) with multiple etiologic factors that generally involve absolute or relative insulin deficiency or insulin resistance or both (Cecil, 1985).

Diabetes mellitus can be separated into two general disease syndrome according to the World Health Organization - The National Diabetes Data Group (WHO - NDDG, 1979).

Type I: Insulin Dependent Diabetes Mellitus, IDDM.

Type II: Non-Insulin Dependent Diabetes Mellitus, NIDDM.

Type I or type II is more liable to all forms of cellular degeneration and delayed wound healing (Cecil, 1985).

Wound healing is a very complicated, it includes four steps in its mechanism. The first step is a hemostasis one. (Macfarlane (1976) defined hemostasis as the spontaneous arrest of bleeding from ruptured blood vessels). The second step is the migration of macrophage cells toward wound region to control and prevent infection by pathogenic organisms. The third step includes Reepithelialization and formation of newly epidermis at the skin. The final step is completed matrix formation and tissue repair (Longaker, et al., 1989).

Thus in Diabetes mellitus, the increasing demand for the treatment of the complications mentioned, is directed by the scientists and researches to solve one of the most important complications in Diabetes mellitus where delayed healing occurs.

Recently, new possibilities have appeared for limiting the progression of wound healing complication in Diabetes mellitus. One of these possibilities is to study the level of plasma fibronectin in the two types of diabetic patients.

AIM OF THE WORK:

The aim of this study is to investigate the changes in the fibronectin level in diabetic patients of both type I and type II, and to determine whether these changes have any relation between the hemostatic system and Diabetes mellitus, which may be of help to find the recent causes of delayed wound healing in these patients and to provide a new trend in the tissue repair in such cases.

FIBRONECTIN

FIBRONECTIN

The word "Fibronectin" was created to emphasize the ability of protein to bind to fibrous proteins like collagen and fibrin, where "fibra = fiber and nectere = to bind" (Kuusela, et al., 1976).

Thus, there is a definition of fibronectin applied by McKeown-Longo (1987) that: "Fibronectin is a group of closely related proteins (glycoproteins) that found in blood, body fluids and tissue extracellular matrices".

As fibronectin is glycoproteins, it is worth to give an idea about it.

1. Definition of glycoproteins:

Harper's text book (1981 a) studied proteins and its major classes. He defined proteins as "compounds of high molecular weight, consist of chains of amino acids united in peptide linkage".

There are two major classes of proteins:

I. Simple proteins.

II. Conjugated proteins.

I. Simple proteins:

Simple proteins which on hydrolysis yield only amino acids, it can be subdivided into classes based upon solubility such as: albumins, globulins, globins, prolamines and histones (Harper's, text book, 1981 a).