

# Role Of Advanced Oxidation Protein Products In Diabetic Micro-Vascular Complications

#### **Thesis**

Submitted for partial fulfillment of Master Degree in Pediatrics

# By Ahmed Omar Khorshed Abdel Hamid M.B.B.Ch, Faculty of Medicine

Under Supervision of

#### Prof. Safinaz Adel El-Habashy

Professor of Pediatrics Faculty of Medicine-Ain Shams University

#### Dr. Hanan Hassan Ahmed Aly

Lecturer of Pediatrics Faculty of Medicine-Ain Shams University

#### Dr. Amr Fattouh Abdel Fattah

Lecturer of Clinical pathology Faculty of Medicine-Ain Shams University

> Faculty of Medicine Ain Shams University



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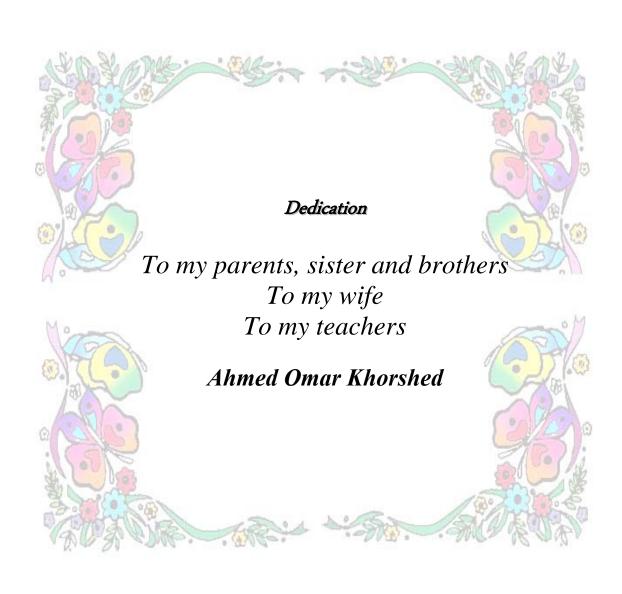
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# **LIST OF ABBREVIATIONS**

ADA	American Diabetes Association
AGE	Advanced Glycation Endproducts
AOPP	Advanced Oxidation Protein Products
BD	Behcet's disease
CAD	Coronary Artery Disease
DCCT	Diabetes Control And Complications Trial
DKA	Diabetic Ketoacidosis
DN	Diabetic nephropathy
DR	Diabetic Retinopathy
ECM	Extra Cellular Matrix
ESRD	End Stage Renal Disease
HbA\c	Hemoglobin A\c
HNF	Hepatocyte Nuclear Factor
HOCL	Hypochlorous Acid
HSA	Human Serum Albumin
IPF	Insulin promoter factor
MCP-1	Monocyte Chemo-Attractant Protein-

MODY	Maturity-onset diabetes of the young
MPO	Myeloperoxidase
NADP	Nicotinamide adenine dinucleotide phosphate
NCEP-Peds	National Cholesterol Education Programme For Pediatrics
NPBI	Non Protein Bound Iron
OGTT	Oral glucose tolerance test
PKC	Protein Kinase C
RAGE	Receptors for AGE
ROS	Reactive Oxygen Species
SMBG	Self monitoring blood glucose
SUR	Sulphonylurea receptor \
T'DM	Type \ Diabetes Mellitus
VSMC	Vascular Smooth Muscle Cells

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# Protocol

### **INTRODUCTION**

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels (American Diabetes Association., \*\* • • \*\* \*\*).

Diabetes mellitus is associated with hyperglycemia and thus with accelerated non-enzymatic glycation, oxidative stress (imbalance between free radicals and reactive oxygen and nitrogen species, and antioxidants in favor of free radicals), and carbonyl stress. Through these mechanisms, Advanced Oxidation Protein Products (AOPP) are formed, and biologically important compounds are damaged (*Kalousova et al.*,  $r \cdot r \cdot r$ ).

Advanced Oxidation Protein Products are formed during oxidative stress by the action of chlorinated oxidants, mainly hypochlorous acid and chloramines (produced by myeloperoxidase in activated neutrophils). They cause induction of proinflammatory cytokines and adhesive molecules (*Kalousova et al.*, \*\*••\*\*\*).

Studies report that advanced oxidation protein products are increased in patients with type ' diabetes mellitus in comparison with healthy subjects and that accelerated glycoxidation takes part in the development of diabetic complications (*Kalousova et al.*, \*\*••\*\*\*).

# **AIM OF THE STUDY**

Assessment of Advanced Oxidation Protein Products (AOPP) in patients with type \ Diabetes mellitus to correlate their levels with occurrence of micro-vascular complications.

## **SUBJECTS AND METHODS**

<u>Type of study</u>: cross-sectional case -control study.

#### **Subjects:**

Patients: Forty five children and adolescents with type ' diabetes mellitus will be recruited from the Pediatric Diabetes Specialized Clinic, Ain Shams University Hospitals.

Patients will be divided into:

Group : Twenty patients with diabetic microvascular complications (retinopathy, nephropathy and/or neuropathy).

Group 7: Twenty five patients without diabetic microvascular complications.

Controls: Thirty healthy subjects age and sex-matched will be included as control group.