

PREVALENCE OF ASYMPTOMATIC PERIPHERAL ARTERIAL DISEASE IN TYPE 2 DIABETIC PATIENTS

Thesis

Submitted for partial fulfillment of master degree in
Endocrinology & metabolism

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2014**

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العظيم

صدق الله العظيم

سورة البقرة الآية: ٣٢



*First of all, I am deeply grateful to **ALLAH**.*

*I would like to express my deepest gratitude and appreciation to **Prof. Dr. Mohamed Reda Halawa**, Professor of Internal Medicine and endocrinology Faculty of Medicine Ain Shams University.*

*I am very grateful to **Prof. Dr. Mona Mohamed Abdelsalam** Assistant Professor of Internal Medicine Faculty of Medicine Ain Shams University for her positive supervision during the preparation of this research and for the extensive time and effort to offer every possible help to complete this work.*

*Special appreciation to **Dr. Yara Mohamed Eid** Assistant Professor of Internal Medicine Faculty of Medicine Ain Shams University for her kind advice, valuable instructions and continuous support which was the corner stone in the completion of this work.*

Last but not least, I would like to present a lot of thanks to my family, friends, and to my colleagues, whose without their help and support, this work could not come to birth.

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LIST OF ABBREVIATION

Abb.	Full term
ABI.....	Ankle-brachial index
ACS.....	Acute oronary syndrome
ADA.....	American diabetes association
AGEs	Advanced glycation end products
AMP	Adenosine monophosphate
AMPK	Adenosine monophosphate kinase
BH4.....	Tetrahydrobiopterin
BMI	Body mass index
BP.....	Blood pressure
CAD.....	Coronary artery disease
CLI.....	Critical limb ischemia
CRP	C-reactive protein
CVD.....	Cardiovascular disease
CVS.....	Cerebrovascular disease
DCCT	Diabetes Control and Complications Trial
DPN.....	Distal polyneuropathy
EASD.....	European Association for the Study of Diabetes
ECD.....	Endothelial cell dysfunction
ET-1	Endothelin -1
FPG	Fasting plasma glucose
GWAS.....	Genome-wide association studies
GBM.....	Glomerular basement membrane
GDM.....	Gestational diabetes mellitus
GEnC	Glomerular endothelial cell
HDL	High density lipoprotein cholesterol
HNF	Hepatocyte nuclear factor
ICAM.....	Intercellular adhesion molecule
IDDM	Insulin dependent diabetes mellitus

LIST OF ABBREVIATION cont.

Abb.	Full term
IDF.....	International Diabetes Federation
IFG	Impaired fasting glucose
IGF-1.....	Insulin-like growth factor -1
IGT	Impaired glucose tolerance
IHD	Ischemic heart disease
IL-6.....	Interleukin-6
IRS	Insulin receptor substrate
LDL	Low density lipoprotein cholesterol
MI.....	Myocardial infarction
MMP.....	Matrix metalloproteinase.
NADP	Nicotinamide adenine dinucleotide phosphate
NGT.....	Normal glucose tolerance
NIDDM	Non insulin dependent diabetes mellitus
NO	Nitric Oxide
NGSP	National Glycohemoglobin Standardization Program
OGTT	Oral glucose tolerance test
PAD.....	Peripheral arterial disease
PAI-1	Plasminogen activator inhibitor-1
PCOD	Polycystic ovary disease
PDGF	Platelet-derived growth factor
PKC	Protein kinase C
PPAR.....	Peroxisome proliferator-activated receptor
PPG	Prandial plasma glucose
PVD	Peripheral vascular disease
ROS	Reactive oxygen species
TGF- β	Transforming growth factor-beta
SOCS.....	Suppresor of cytokine signaling

LIST OF ABBREVIATION cont.

Abb.	Full term
TCF 7L2.....	Transcription factor 7
TGs.....	Triglycerides
TNF	Tumour necrosis factor
TZDs.....	Thiazolidinediones
USDA	U.S. Department of Agriculture.
VCAM	Vascular cell adhesion molecule
VSMC.....	Vascular smooth muscle cell
VWF	von Willebrand factor
WC.....	Waist circumference
WHR.....	Waist hip ratio
WHO.....	World health organization

INTRODUCTION

Diabetes mellitus (DM) prevalence is increasing worldwide. The number of people with DM is expected to double from 175 million in 2000 to 353 million in 2030. The largest increase is expected to occur in developing countries (*Yach D, et al 2006*).

Atherosclerosis is a progressive process affecting multiple vascular beds; its clinical consequences, which include coronary artery disease (CAD), cerebrovascular disease, and peripheral arterial disease (PAD) - occlusive arterial disease of the lower extremities-, are potentially life threatening *Munger MA, et al 2004*. Atherosclerotic disease in one vascular bed indicates possible disease in others (*Ness J, et al 1999*).

Epidemiological studies have confirmed an association between diabetes and an increased prevalence of PAD (*Donahue RP, et al 1992*).

Peripheral arterial disease in patients with diabetes adversely affects quality of life and is associated with substantial functional impairment (*Vogt MT, et al 1994*). Reaching up to ischemic ulceration of the foot and risk of limb loss (*Hiatt WR.2002*). However, many patients with PAD are

asymptomatic, or have atypical exertional symptoms. (*Schainfeld RM. 2001*).

The true prevalence of PAD in people with diabetes has been difficult to determine, as most patients are asymptomatic, many do not report their symptoms, screening modalities have not been uniformly agreed upon, and pain perception may be blunted by the presence of peripheral neuropathy. The reported prevalence of PAD is also affected by the methods by which the diagnosis is sought. A more accurate estimation of the prevalence of PAD in diabetes should rely upon a validated and reproducible test. Such a test is the ankle-brachial index (ABI). (*American Diabetes Association 2003*)

In studies using the ankle-brachial index (ABI), which is the preferred screening technique, the prevalence of PAD (defined as an $ABI \leq 0.90$) in diabetic individuals ranges from 20% to 30% (*Elhadd TA, et al 1999*).

AIM OF THE WORK

Study the prevalence of asymptomatic peripheral arterial disease in a cohort of Egyptian patients with type 2 diabetes using ABI

Chapter 1

DIABETES MELLITUS

Definition:

Diabetes mellitus is a group of metabolic diseases of multiple aetiologies characterized by hyperglycaemia together with disturbances of carbohydrate, fat, and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycaemia of diabetes is associated with microvascular damage affecting, particularly, eyes, kidneys, nerves, and heart, together with an increased risk of macrovascular disease (*WHO 2011*).

Classification: (*WHO 2011*)

The classification of diabetes includes four clinical classes:

1-Type 1 diabetes (results from β -cell destruction, usually leading to absolute insulin deficiency)

2-Type 2 diabetes (results from a progressive insulin secretory defect on the background of insulin resistance)

3-Other specific types of diabetes due to other causes, e.g., genetic defects in β -cell function, genetic defects in insulin action, diseases of the exocrine pancreas (such as cystic fibrosis), and drug- or chemical-induced (such as in the treatment of HIV/AIDS or after organ transplantation)