Metabolic Syndrome And Erectile Dysfunction

Essay

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In Dermatology and Venereology

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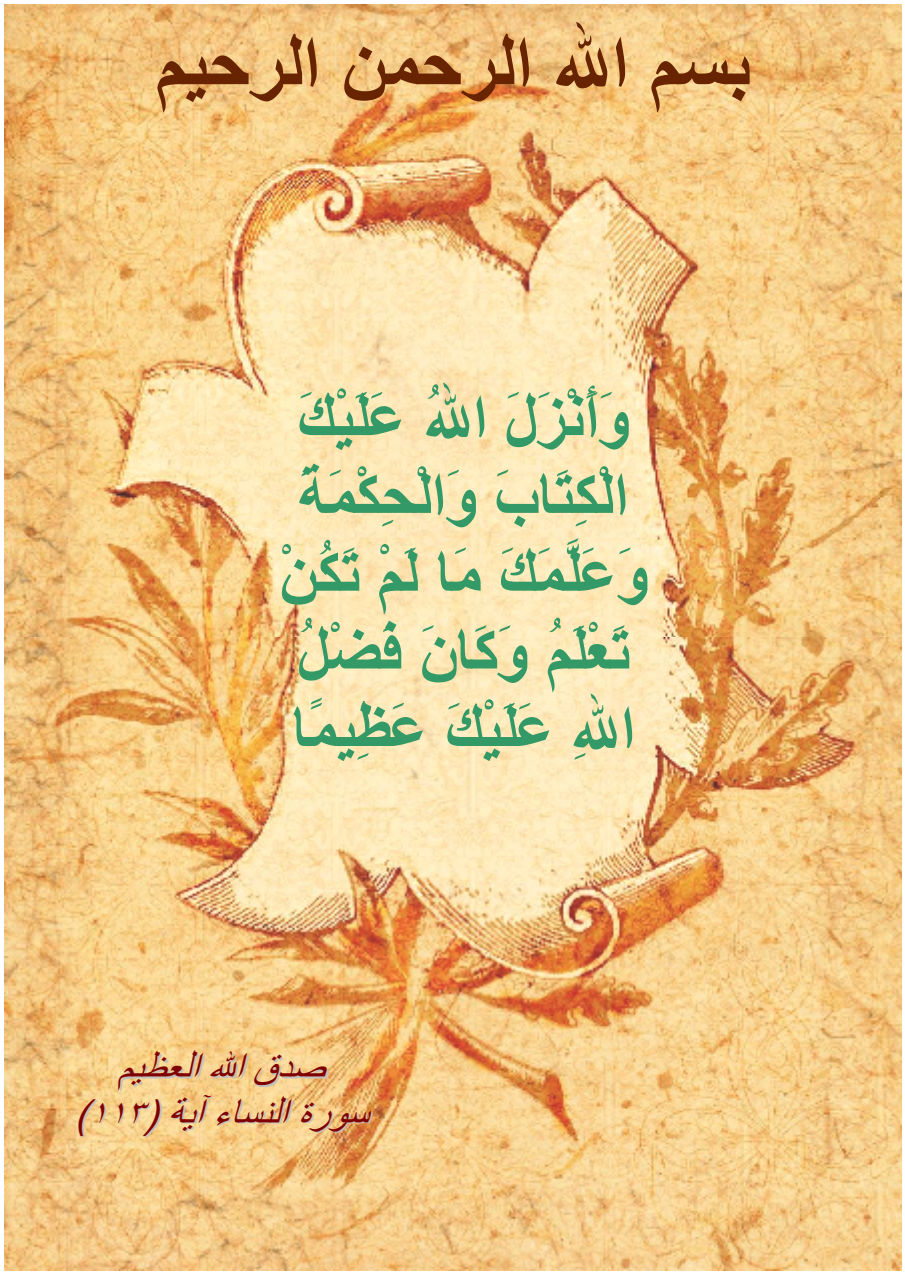
بسم الله الرحمن الرحيم
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تَعْلَمُ وَكَانَ فَضْلُ
اللهِ عَلَيْكَ عَظِيمًا
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List of Abbreviations

Abb.	Meaning
AACE	American Association of Clinical Endocrinologists
AIIAs	Angiotensin II antagonists
ACE	Angiotensin-converting enzyme
ADA	American Diabetes Association
AGEs	Advanced glycation end products
ALP	Alkaline phosphatase
ALT	Alanine transaminase
Ang II	Angiotensin II
ANS	Autonomic nervous system
AR	Adrenoceptor
ARBs	Angiotensin receptor blockers
AST	Aspartate transaminase
AT١	Angiotensin receptors ١
ATP	Adult Treatment Panel
AUA	American Urological Association
BH٤	Tetrahydrobiopterin
BMI	Body mass index
BPH	Benign prostatic hyperplasia
CAD	Coronary artery disease
cAMP	Cyclic adenosine monophosphate
CCBs	Calcium channel blockers
cGMP	Cyclic guanosine monophosphate
CHF	Chronic heart failure
CO	Carbon monoxide
CRP	C-reactive protein
Cmax	Peak plasma concentration

Abb.	Meaning
CVD	Cardiovascular diseases
CYP	Cytochrome P٤٥٠
DASH	Dietary Approaches to Stop Hypertension
DBP	Diastolic blood pressure
DM	Diabetes mellitus
ED	Erectile dysfunction
EDHF	Endothelium derived hyperpolarizing factor
EDRF	Endothelium derived releasing factor
EF	Erectile function
ELISA	Enzyme linked immunosorbant Assay
eNOS	Endothelial nitric oxide synthase
ET-١	Endothelin-١
ETT	Exercise tolerance test
FBG	Fasting blood glucose
FDA	Food and drug administration
FPG	Fasting plasma glucose
GAQ	Global assessment questions
GnRH	Gonadotropin releasing hormone
GTP	Guanosine triphosphate
HbA١c	Hemoglobin A١c
HDL	High density lipoprotein
HFD	High-fat diet
HLA	Human leucocytic antegin
HMG-CoA	٣-hydroxy-٣-methylglutaryl coenzyme A reductase Inhibitors
HO-٢	Heme oxygenase
HTN	Hypertension
ICI	Intracavernous injection

Abb.	Meaning
ICS	International continence society
IDF	The International Diabetes Federation
IFG	Impaired fasting glucose
IGT	Impaired glucose tolerance
IIEF	International Index of Erectile Function
IIEF ١٥	International index of erectile function ١٥
IL-٦	Interleukin-٦
iNOS	Inducible nitric oxide synthase
LDL	Low density lipoprotein
LVD	Left ventricular dysfunction
MI	Myocardial infarction
MLC	Myosin light chain
MMAS	Massachusetts male aging study
mmol / L	Millimole per liter
MODY	Maturity-onset diabetes of the young
mRNA	Messenger RNA
MS	Metabolic Syndrome
NADPH	Reduced nicotinamide adenine dinucleotide phosphate
NAION	Non arteritic anterior ischemic optic neuropathy
NANC	Non adrenergic, non-cholinergic
NASH	Non - alcoholic steatohepatitis
NCEP	National Cholesterol Education Program
NIDDM	Non-Insulin Dependent Diabetes Mellitus
nNOS	Neurogenic nitric oxide synthase
NO	Nitric oxide
NOS	Nitric oxide synthase
NPT	Nocturnal penile tumescence
NYHA	New York Heart Association

Abb.	Meaning
OGTT	Oral Glucose Tolerance Test
PCDU	Penile color Doppler ultrasound
PDEs	Phosphodiesterases
PGE١	Prostaglanin E ١
PPAR	peroxisome proliferator-activated receptor
PSV	peak systolic velocity
PVD	Peripheral Vascular Disease
RAAS	Renin-angiotensin aldosterone neurohormonal system
RBCs	Red Blood Cells
REM	Rapid eye movement
ROS	Reactive oxygen species
SBP	Systolic blood pressure
SHBG	Sex hormone binding globulin
SL	Sublingual
SGOT	Serum Glutamic Oxalacitic Transaminase
SGPT	Serum Glutamic Pyruvic Transaminase
SMBG	Self-monitoring of blood glucose
SSRI	Selective serotonine reuptake inhibitors
T٢DM	Type II Diabetes mellitus
TG	Triglycerides
TNF-α	Tumor necrosis factor-α
TRT	Testosterone Replacement Therapy
U.S	United States
VCAM	Vascular Cell Adhesion Molecule
VIP	Vasoactive intestinal polypeptide
WBCs	White blood cells
WC	Waist circumference
WHO	World Health Organization

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Introduction

The metabolic syndrome (MS) is considered the most important public health threat of the ٢١st century, affecting between ١٠ to ١٥٪ of adult populations worldwide. This syndrome is characterized by a cluster of medical disorders including central abdominal obesity, elevated triglycerides, reduced High density lipoprotein (HDL), high blood pressure, and increased fasting glucose and hyper-insulinemia. The higher prevalence of this syndrome in the occidental populations is mainly due to increasingly sedentary life styles and diets higher in saturated fats **(Taskinen et al., ٢٠٠٧)**.

Erectile dysfunction (ED) is also a major concern, epidemiological data suggest that the prevalence of this pathology ranges between ١٦ and ٥٢٪ depending on the patient population and affects up to ١٠٠ million men worldwide **(Lue, ٢٠٠٠).**

Recently it was observed that there is an association between ED and MS. Several studies stated a higher prevalence of ED in men with the MS **(Salvador, ٢٠١٢).**

Hypertension, diabetes mellitus (DM), hyperlipidemia, and smoking all represent risk factors for cardiovascular diseases (CVD) because they are all considered to induce vascular endothelial damage, resulting in vascular obstruction,

plaque rupture, thrombosis, arterial sclerosis and also erectile dysfunction (ED). More specifically, ED will be considered a symptom of damage to the vascular endothelium **(Shirai, ١٩٩٩).**

It has been suggested that nearly ٥٠٪ of the cases of erectile dysfunction in men older than ٥٠ years of age are caused by vascular diseases **(Kloner and Jarow, ١٩٩٩).**

This association has been target of increasing interest. It was suggests that the common denominator of ED and MS is endothelial dysfunction. This connection may have an important impact in Public Health because erectile dysfunction appears to be one of the earliest signs of systemic vascular disease and might be considered as an early marker for Metabolic Syndrome (MS) including subclinical cardiovascular disease allowing preventive strategies **(Le et al., ٢٠٠٤).**

Aim of the Essay

The aim of this essay is to review the relationship between metabolic syndrome and erectile dysfunction, with special emphasis on common shared risk factors, and to clarify the pathophysiology of erectile dysfunction in metabolic syndrome.

Metabolic Syndrome

Metabolic syndrome is a combination of disorders of the body's metabolism that increases the risk of heart disease, stroke, and diabetes. It is a very common and dangerous medical problem.

Overweight, poor diet, a lack of exercise, and other unhealthy lifestyle habits, such as smoking, appear to be factors that contribute to metabolic syndrome. It tends to run in families, so the genes you inherit also play a role **(McKesson, ٢٠١٠).**

Definition:

Metabolic syndrome is defined by the presence of ٣ or more of the following health conditions:

- Excess weight around the waist (waist measurement of more than ١٠٢ cm for men and more than ٨٨ cm for women).
- Triglycerides blood level of ١٥٠ mg/dL or more.
- HDL cholesterol levels below ٤٠ mg/dL for men and below ٥٠ mg/dL for women.
- Blood pressure of ١٣٠/٨٥ mmHg or higher.
- Pre-diabetes (a fasting blood sugar between ١٠٠ and ١٢٥) or diabetes (a fasting blood sugar level over ١٢٥ mg/dL).