The Association between Serum Adiponectin Levels and the Severity of Coronary Artery Disease as Assessed by Coronary Angiography

Thesis

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بسم الله الرحمن الرحيم
وَأَنْزَلَ اللهُ عَلَيْكَ
الْكِتَابَ وَالْحِكْمَةَ
وَعَلَّمَكَ مَا لَمْ
تَكُنْ تَعْلَمُ وَكَانَ
فَضْلُ اللهِ عَلَيْكَ
عَظِيمًا
صدق الله العظيم
سورة النساء آية (١١٣)

This work is dedicated to . . .

My beloved father, **to whom I owe everything I ever did in my life and will achieve, may** ***ALLAH*** **put peace on his soul**

My mother **for always being there for me**

My brothers and my sister **for their support**

Finally ***my wife and my lovely son (Ali)*** **for being the light of my life**

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List of Abbreviations

3q27	Chromosome 3 long arm band 27
ACC	American college of cardiology
ACE	Angiotensin converting enzyme
Acrp 30	Adipocyte complement-related protein of 30 kDa
ACS	Acute coronary syndrome
AdipoR	Adiponectin receptor
AHA	American Heart Association
AMPK	AMP activated protein kinase
ANOVA test	Analysis of variance test
apM1	Adipose most abundand gene transcript 1
apo	apo lipoprotein
BMI	Body mass index
CA	Coronary angiogram
CABG	Coronary artery bypass grafting
CAD	Coronary artery disease
CIMT	Common carotid artery intima-media thickness
COX	Cyclooxygenase
CRP	C-reactive protein
CVD	Coronary vascular disease
D_1	First diagonal branch of LAD artery
D_2	Second diagonal branch of LAD artery
DM	Diabetes millitus
ECG	Electrocardiogram
ELISA	Enzyme linked immunosorbant assay
eNOS	Endothelial nitric oxide synthase
FC	Fibrous cap
GBP28	Gelatin-binding protein of 28 kDa
HDL	High density lipoprotein
HMG-COA	3-hydroxy-3- methylglutaryl coenzyme A
HMW	High- molecular weight

HOPE	Heart Outcome Prevention Evaluation
HS	Highly significant
hs- CRP	High sensitivity CRP
HTN	Hypertension
ICAM	Intercellular adhesion molecule
IL	Interleukin
IVUS	Intra vascular ultrasound
kDa	Kilodalton
LAD	Left anterior descending artery
LCX	Left circumflex artery
LDL	Low density lipoprotein
LM	Left main coronary artery
LP	Lipoprotein
LV	Left ventricle
LVEDP	Left ventricle end diastolic pressure
MACR	Macrophage
MAPK	Mitogen- activated protein kinase
MCP-1	Monocyte chemoattractant protein-1
MGS	Modified Gensini score
MI	Myocardial infarction
MMP	Matrix metalloproteinase
MP	Myeloproliferative
MPI	Myocardial perfusion imaging
mRNA	Messenger ribonucleic acid
MVD	Multi vessel disease
mm	Millimeter
mm^2	Milimeter square
NO	Nitric oxide
NPV	Negative predictive value
NS	Non significant
PCI	Percutaneous coronary intervention
PDGF	Platelet-derived growth factor
PDS	Percentage diameter stenosis

PPAR	Peroxisome proliferator activated receptor
PPV	Positive predictive value
QCA	Quantitative coronary angiography
r	Linear Correlation Coefficient
RCA	Right coronary artery
RIO-Lipids study	Rimonabant in Obesity-Lipids study
ROC	Receiver operating characteristic curve
ROS	Reactive oxygen species
rpm	Rounds per minute
RT	Room temperature
SAPHIR study	Salzburg Atherosclerosis Prevention Program in subjects at High Individual Risk study
SD	Standard deviation
SE	Standard error
SMCs	Smooth muscle cells
SPSS	Self Propelled Semi-Submersible
SR-As	Class A scavenger receptors
STEMI	ST-segment elevation myocardial infarction
SVD	Single vessel disease
TIMI	Thrombolysis in myocardial infarction
TNF	Tumor necrosis factor
TNF-α	Tumor necrosis factor- alpha
TVD	Two vessel disease
VCAM-1	Vascular cell adhesion molecule-1

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INTRODUCTION

Coronary artery disease (CAD) is now the leading cause of death worldwide, and it is expected that the rate of CAD will accelerate in the next decade. The global burden of CAD carries with it a heavy financial cost ***(Lippy et al., 2008)***.

Recently, adipose tissue has shed its label as a sedentary storage depot of excess energy, and has emerged as a metabolically active participant in mediating vascular complications, serving as an active endocrine and paracrine organ secreting an ever increasing number of mediators, known as adipokines, which participate in diverse metabolic processes ***(Lau et al., 2005).*** Although most adipokines such as leptin, TNF-α, plasminogen activator inhibitor-1; appear to promote vascular disease, but among these adipokines is adiponectin which seems to possess antiatherogenic and anti-inflammatory effects and may be protective against cardiovascular disease development ***(Giannessi et al., 2007).***

Surprisingly, obese subjects have significantly lower levels of plasma adiponectin when compared with non obese subjects, and the adiponectin levels are negatively correlated to body mass index (BMI) in both male and female subjects ***(Arita et al., 1999)***. The circulating adiponectin concentrations are correlated more negatively with visceral fat area than with