Assessment of Correlation between Angiopoietin-Like Protein II (ANGPTL-2) and Insulin Resistance in Type 2 DM Cases and Obese Persons

Thesis

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Salah Hussein Elhalawany

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List of Abbreviations

Abb.	Full term
2hpp	2 hours post prandial
ACE	Angiotensin- converting enzyme.
ADA	American diabetes association
AGE	Advanced glycation end products
ANGPTL-2	Angiopoietin-like protein II level
apo B	Apolipoprotein B
ARB	Angiotensin recptor blocker
ATP	Adenosine triphosphate
ATP III	Adult Treatment Pannel III
BMAL1	Brain and muscle aryl hydrocarbon receptor nuclear translocator like protein 1
BMI	Body mass index
CAD	Coronary artery disease
C-AMP	Cyclic adenosine monophosphate
CHD	Coronary heart disease
CKD	Chronic kidney disease
CLOCK	Circadian locomotor output kaput
CVD	Cardiovascular disease.
CYP	Cytochrome p
DAN	Diabetic autonomic neuropathy
DBP	Diastolic blood pressure
DCCT	Diabetes Control and Complications Trial
DDP-4	Dipeptidyl peptidase -4
DM	Diabetes mellitus
DR	Diabetic retinopathy
DSPN	Distal symmetrical sensorimotor polyneuropathy

Abb.	Full term
ELISA	Enzyme linked immunosorbant assay.
eNOS	Endothelial enzyme nitric oxide synthase
ER	Rough endoplasmic reticulum
FFA	Free fatty acid
FPG	Fasting plama glucose.
GLUT 4	Glucose transporter 4
GTP	Guanosine tri- phosphate
GWAS	Genome wide association study
HDL-c	High density lipoprotein cholesterol
HOMA-IR	Homeostasis model assessment for insulin resistance
HRP	Horseradish Peroxidase
Hs-CRP	High sensitive C reactive protein
ICAM-1	Intracellular adhesion molecule-1
IDDM	Insulin dependent Diabetes mellitus.
IDF	International Diabetes Federation
IFN	Interferon
IGF-1	Insulin-like growth factor I
IGF-II	Insulin-like growth factor II
IGT	Impaired glucose tolerance
IGTT	Insulin glucose tolerance test
IKK-Eβ	Inhibitor of Kappa beta kinase
IL-6	Interlukein-6
IR	Insulin resistance
IRS-1, 2	Insulin receptor substrate1,2
LDL-c	Low-density lipoprotein cholesterol.
LILRB2	Leukocyte immunoglobulin-like receptor subfamily B member 2 i
m RNA	Messenger Ribonucleic acid

Abb.	Full term
MAbs	Monoclonal antibodies
MAPK	Mitogen activated protein kinase
MCP-1	Monocytes chemo-attractant protein-1
MODY 1	Maturity onset diabetes of the young 1
NADPH	Nicotinamide adenine dinucleotide phosphate
NCEP	National Cholesterol Education Program
NF-kB	Nuclear factor-kappaB
NGSP	National Glycohemoglobin Standardization Program
NHANES	National Health and Nutrition Examination Survey
NO	Nitric oxide
OD	Optical density
OGTT	Oral glucose tolerance test
OSA	Obstructive sleep apnea
PAD	Peripheral arterial disease
PAI-1	Plasminogen activator inhibitor-1
PCOS	Polycystic ovary syndrome
PDGF	Platelet drived growth factor
PI3-K	Phosphatidylinositol 3-kinase
PIP-3K	Phosphatidylinositol triphosphate Kinase
PPAR	Peroxisome proliferator activated receptors
RAAS	Renin Angiotesinogen-Aldosteron system
Roc-Curve	Receiver operating characteristics curve analysis.
SBP	Systolic blood pressure
T2DM	Type 2 Diabetes mellitus.
TG	Triglycerides

Abb.	Full term
TGF	Transforming growth factor.
TGF-B	Transforming growth factor B
TH0	T-helper 1
Th1	T-helper 1
TIA	Transient ischemic attacks
TLR	Toll-like receptors
TMB	Tetramethylbenzydine
TNF-α	Tumor necrosis factor alpha
TZD	Thiazolidinedione
UKPDS	United Kingdom Prospective Diabetes Study
USA	United States of America.
VEGF	Vascular endothelial growth factor
VLDL	Very low density lipoprotein
WHR	Waist hip ratio

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Assessment of Correlation between Angiopoietin-Like Protein II (ANGPTL-2) and Insulin Resistance in Type 2 DM Cases and Obese Persons

Abstract

Introduction: ANGPTL-2 is primarily secreted by adipose tissue. Increased circulating ANGPTL2 levels are closely related to adiposity, inflammation and systemic insulin resistance. is to assess the correlation between angiopoietin-like protein II (ANGPTL-2) and insulin resistance in type 2 DM cases and obese persons.

Materials and methods: a total 80 subjects were included in the study their mean age was 51±6 years old, and they were divided into four groups. Group (I) Included 20 obese type 2 diabetic patients, group (II) Included 20 obese non-diabetic patients, group (III) Included 20 lean type 2 diabetic patients and group (IV) Included 20 lean non-diabetic subjects as control. All subjects in this study were subjected to full medical history taking, thorough physical examination, fundus examination, abdominal ultrasound, FPG, HbA1c, lipid profile, ALT, AST, Creatinine, BUN, HCV antibody, HBs Ag, Urinary protein creatinine ratio, HOMA IR, Serum ANGPTL-2 and hs-CRP.

Results: The present study showed that there was a high statistical significant difference between the studied groups *(p-value<0.01)*, being the highest in group I (mean 12.6 ± 4.1 ng/ml) followed by group III (9.5±3.8 ng/ml), group II (7.6±3.2 ng/ml) and group IV (5.6±1.8 ng/ml).

Moreover, Serum ANGPTL-2 level was significantly higher in type 2 diabetic patients with diabetic retinopathy. Multivariable binary logistic regression analysis in the current study demonstrated that ANGPTL-2 was found to be an independent predictor for insulin resistance and T2DM but not for obesity.

Conclusion: ANGPTL-2 can be used as an independent predictor for insulin resistance and T2DM.

Keywords: Angiopoietin-like protein II level, Fasting plama glucose, Type 2 Diabetes mellitus.