



Association between Visfatin and Some Parameters of Iron Metabolism in Egyptian Subjects with Altered Glucose Tolerance

Athesis

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الإرتباط بين الفيزيقاتين و بعض دلائل أيض الحديد فى المصريين المصابين بتغير فى تحمل نسبة الجلوكوز

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CONTENTS

Acknowledgement	<i>Page</i> i
Abstract	iii
List of abbreviations	iv
List of figures	vii
List of tables	x
Introduction	xiii
Aim of the work	xv

Chapter I

Review of Literature

I.1. Definition of diabetes mellitus	1
I.2. Classification of diabetes mellitus	2
I.2.1. Insulin-dependent diabetes mellitus	4
I.2.2. Non-insulin-dependent diabetes mellitus.....	6
I.2.3 Impaired glucose tolerance and impaired fasting glucose	17
I.3. Some parameters used in diabetes mellitus.....	19
I.3.1. Visfatin.....	19
I.3.1.1 Discovery of visfatin.....	19
I.3.1.2. Structure of visfatin.....	19
I.3.1.3. Functions of visfatin.....	20
I.3.1.4.Hyperglycemia and visfatin.....	27
I.3.2. Iron.....	28
I.3.2.1. Iron Metabolism	28
I.3.2.2. Dietary iron and type II diabetes	31
I.3.2.3. Ferritin.....	34
A) Ferritin structure.....	34
B) Ferritin regulation.....	35
C) Ferritin function.....	37
D) Ferritin and the immune system.....	37
I.3.2.4. Soluble transferrin receptor.....	38
I.3.3. Tumor Necrosis Factor.....	40
A) Structure of TNF.....	40

B) TNF- α and insulin resistance.....	40
I.3.4. insulin resistance (HOMA),insulin sensitivity(QUICKI) and Beta-cell function (HOMA β) ..	42

Chapter II

Subjects and Methods

II.1 Subjects.....	44
II.2 Methods.....	47
II.2.1 Determination of plasma glucose	47
II.2.2. Determination of glycated hemoglobin	48
II.2.3. Determination of serum insulin.....	53
II.2.4. Determination of serum insulin resistance, insulin sensitivity and Beta-cell function.....	57
II.2.5. Determination of serum total cholesterol....	58
II.2.6. Determination of serum triacylglycerols.....	60
II.2.7. Determination of serum HDL-C and LDL-C...	61
II.2.8. Determination of serum ferritin.....	63
II.2.9. Determination of serum sTFR.....	68
II.2.10. Determination of serum visfatin.....	72
II.2.11. Determination of serum TNF- α	76
II.3. Statistical analysis	80

Chapter III

Results and Discussion

III.1.Results.....	83
III.2.Discussion.....	124

Chapter IV :

IV.1. Summary and Conclusion.....	136
IV.2. References.....	139
IV.3. Individual data.....	159
Arabic Summary	
Arabic Abstract	

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Abstract

Visfatin is an adipokine mainly synthesized and secreted in visceral fat. Visfatin was found to have important proinflammatory and immunomodulating properties and also found to function as nicotinamide phosphoribosyl transferase (Nampt), the rate-limiting enzyme in the NAD

biosynthetic pathway. The aim of the present work was to investigate the relation between serum visfatin, some parameters of iron metabolism and insulin resistance in altered glucose tolerance patients and its relation to obesity.

Eighty subjects were included in this study; 60 patients and 20 healthy subjects, sex and age matched, used as controls (Gr.I). The patients were divided into: Gr. II impaired glucose tolerance patients (IGT patients); Gr. III (type I diabetic patients); Gr. Iva (obese type II diabetic patients) and Gr. IV_b (non obese type II diabetic patients).

The following biochemical parameters were estimated in this study: serum visfatin, fasting and plasma pp glucose, glycated hemoglobin (HbA_{1c}), serum insulin, HOMA, HOMA β , QUICKI, serum total cholesterol, LDL-C, HDL-C, triacylglycerols (TGs), serum ferritin, serum sTFR, as well as serum TNF- α .

Results indicated a significant positive correlation between serum visfatin and each of FPG (in IGT patients); serum ferritin and negatively with sTFR/log ferritin (in type I diabetics); serum sTFR (in obese type II diabetic patients). Serum ferritin level showed a significant positive correlation with BMI, waist to hip ratio and HDL-C (in non obese type II patients) and with visfatin, TNF- α (in type I patients).

As a conclusion, serum visfatin is correlated to some parameters of iron metabolism in type I and in obese type II diabetics. It is also correlated with FPG in IGT group. So visfatin may be increased due to hyperglycaemia itself and at the same time it may induce progression of inflammatory condition.

List of Abbreviations

ADP	: Adenine dinucleotide phosphate
AP-1	: Activating protein -1
AKT	: Protein kinase B
BAT	: Brown adipose tissue
CRP	: C-reactive protein
DM	: Diabetes mellitus
ELISA	: Enzyme linked immunosorbant assay
FFA	: Free fatty acid
FPG	: Fasting plasma glucose
GDM	: Gestational diabetes mellitus
GAD	: Glutamic acid decarboxylase
Glut-4	: Glucose transporter -4
GSIS	: Glucose stimulated insulin secretion
HbA _{1c}	: Hemoglobin A _{1c}
HOMA	: Homeostasis Model Assessment (as indication of insulin resistance)
HOMA β	: Homeostasis Model Assessment for β Cell Function
HDL	: High density lipoprotein
IDDM	: Insulin-dependent diabetes mellitus
IGT	: Impaired glucose tolerance
IGF	: Impaired fasting glucose
IR	: Insulin resistance
IL	: Interleukin
IKK β	: I- kappa- β kinase
IRS	: Insulin receptor substrate
IRE	: Iron regulatory element

List of Abbreviations (Cont.)

IRP	: Iron regulatory protein
JUK	: C-jun-NH ₂ terminal kinase
JDS	: Japan diabetes society
LDL	: Low density lipoprotein
MCP-1	: Monocyte chemoattractant protein-1
MAPK	: Mitogen activated protein kinase
Nampt	: Nicotinamide phosphoribosyl transferase
NAD	: Nicotinamide adenine dinucleotide
NaMN	: Nicotinic acid mononucleotide
NIDDM	: Non-insulin-dependent diabetes mellitus
NMN	: Nicotinamide mononucleotide
Nm nat	: Nicotinamide/nicotinic acid mononucleotide adenylyl transferase
NPT	: Nicotinic acid phosphoribosyl transferase
NTBI	: Non transferring bound iron
OGTT	: Oral glucose tolerance test
PPPG	: Postprandial plasma glucose
PBEF	: Pre- β cell enhancing factor (Visfatin/ Nampt)
PKC	: Protein kinase C
PEPCK	: Phosphoenol pyruvate carboxykinase
PI3k	: Phosphatidyl inositol 3 kinase
QUICKI	: Quantitative Insulin Sensitivity Check Index
ROS	: Reactive oxygen species
TGs	: Triacylglycerols
TNF	: Tumor necrosis factor
SIR2	: Sirtuin family

List of Abbreviations (Cont.)

SMC	:	Smooth muscle cells
sTFR	:	soluble transferrin receptor
VLDL	:	Very low density lipoprotein
WAT	:	White adipose tissue

List of Figures

<i>Fig. No</i>	<i>Title</i>	<i>Page</i>
(1)	Causes of hyperglycemia in type II diabetes	6
(2)	Cell types involved in adipose tissue and inflammation	11
(3)	Fatty acid-induced insulin resistance	15
(4)	Cytokine-induced insulin resistance	16
(5)	Are all fats created equal	22
(6)	The NAD biosynthesis pathways from nicotinamide in mammals	26
(7)	Overview of iron metabolism	29
(8)	Potential mechanisms for the role of iron in etiology of type 2 diabetes	32
(9)	Standard curve of insulin	56
(10)	Standard curve of ferritin	68
(11)	Calibration curve of sTFR.	72
(12)	Standard curve of visfatin	76
(13)	Caliberation curve of TNF- α	79
(14)	% change of the mean values of serum insulin, QUICKI, HOMA and HOMA β in different groups (significant results are only represented).	112
(15)	% change of the mean values of lipid profile in different groups (significant results are only represented).	113
(16)	% change of the mean values of HbA1c, sTFR, ferritin and sTFR/log ferritin in different groups (significant results are only represented).	114
(17)	% change of the mean values of serum TNF- α and visfatin in different groups (significant results are only represented).	115
(18)	Linear correlation between sTFR and sTFR/log ferritin in type I diabetic patients.	116
(19)	Linear correlation between sTFR and LDL-C in type I diabetic patients.	116
(20)	Linear correlation between visfatin and sTFR/log ferritin in type I diabetic patients	116