OMENTIN-١ IN CHILDHOOD DIABETES

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بسم الله الرحمن الرحيم

وَأَنْزَلَ اللّٰهُ عَلَيْكَ
الْكِتَابَ والْحِكْمَةَ
وَعَلَّمَكَ مَا لَمْ تَكُنْ
تَعْلَمُ وَكَانَ فَضْلُ
اللّٰهِ عَلَيْكَ عَظِيمًا

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LIST OF CONTENTS

LIST OF TABLES

LIST OF TABLES (Con...)

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abbrev.	Full term
ACE	Angiotensin converting enzyme
APCs	Antigen presenting cell
BMI	Body mass index
CSII	Continuous subcutaneous insulin infusion
DCCT	Diabetes control and complication trial
DKA	Diabetic ketoacidosis
DM	Diabetes mellitus
DpT-١	The diabetes prevention trial ١
GAD٦٥	Glutamic acid decarboxylase autoantibodies (٦٥ K isoform)
GFR	Glomerular filtration rate
HA١c	Glycated hemoglobin
hEs	Human embryonic stem
HHS	Hyperglycemic hyperosmolar state
HOMA	The hemostatic model assessment
HWF	Hepatocyte nuclear factor
IA٢	ICA ٥١٢ or tyrosine phsophatase autoantibodies
IAA	In autoantibodies
ICA	Islet cell autoantibodies
IDDM	Insulin dependent diabetes mellitus
IL	Interleukin
IR	Insulin resistance
LDL	Low density lipoprotein
MODY	Maturity onset diabetes of the young

LIST OF ABBREVIATIONS (Cont...)

Abbrev.	Full term
NGSP	National Glycohemoglobin Standardization program
NKT	Natural killer T cells
NNTR	Variable number of tandem repeats
OGTT	Oral glucose tolerance test
PCOS	Polycystic ovary syndrome
PDR	Proliferative diabetic retinopathy
T\DM	Type I diabetes mellitus

INTRODUCTION

Diabetes mellitus is a heterogeneous group of metabolic diseases characterized by hyper-glycemia resulting from defects in insulin secretion, insulin action, or both. The current classification of diabetes mellitus includes; type١ diabetes, type ٢ diabetes and gestational diabetes ***(Bailey-Bucktrout et al., ٢٠٠٩).***

T١DM diabetes is considered as an autoimmune disease which is developed due to T-cell-mediated destruction of β cells in the islets of Langerhans of the pancreas. In children with active β-cell destruction auto antibodies against β-cell structures appear in the circulation. In T١DM the cause for β-cell destruction is not known. T١DM is the most common form of diabetes in children worldwide, and approximately ٨٠٪ of the children with diabetes have T١DM. In addition, there are several rare forms of diabetes diagnosed in the early childhood or in late youth ***(Harjutsalo et al., ٢٠٠٨).***

Type ٢ diabetes mellitus is a heterogeneous syndrome characterized by insulin resistance and/or defective insulin secretion ***(Gerich, ١٩٩٨).*** The mechanisms underlying insulin résistance are not yet fully clarified. The body mass index (BMI) and serum triglycerides are the most important factors responsible for the evolution of insulin resistance in type٢ diabetic patients ***(Taniguchi et al., ٢٠٠٠).***

Adipose tissue is now recognized as an endocrine organ that secretes peptides known as adipokines. Adipokines may

function as modulators of metabolism, such as leptin, adiponectin, resistin, apelin and omentin, or as modulators of inflammation, such as TNFα, interleukin-٦, adipsin, acetylation-stimulating protein, plasminogen-activator inhibitor type ***(Eldor et al., ٢٠٠٦).***

Omentin is a novel adipokine codified by two genes that as selectively expressed in visceral adipose tissue and highly abundant in plasma ***(Schaffler et al., ٢٠٠٥).*** The concentration of omentin١, the major circulating isoform in human plasma, was determined to be ١٠٠ ng to ١ mg/ml ***(Yang et al., ٢٠٠٦).***

The levels of circulating omentin-١ are decreased in obesity, and they correlate with several markers of the metabolic syndrome,positively with adiponectin and high-density lipoprotein (HDL) levels and negatively with body mass index (BMI), waist circumference, insulin resistance and leptin level ***(de Souza et al. ٢٠٠٧).***

Omentin levels decrease with obesity and insulin resistance and increase as high-density lipoprotein and adiponectin increase ***(de Souza et al., ٢٠٠٧).***

AIM OF THE WORK

To asses plasma omentin level in obese children and adolescents with type ١ diabetes mellitus and type ٢ diabetes mellitus as well as none obese children and adolescents with type ١ diabetes mellitus and type ٢ diabetes mellitus in relation to matched age and sex healthy control subjects.

DIABETES MELLITUS

Definition:

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both.

The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction and failure of different organs especially the eyes, kidneys, nerves, heart and blood vessels ***(American Diabetes Association, ٢٠١٠)***.

Several pathogenic processes are involved in the development of diabetes. These range from autoimmune destruction of the β cells of the pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action. The basis of the abnormalities in carbohydrate, fat, and protein metabolism in diabetes is deficient action of insulin on target tissues. Deficient insulin action results from inadequate insulin secretion and/or diminished tissue responses to insulin at one or more points in the complex pathways of hormone action ***(American Diabetes Association, ٢٠١٠)***.

Impairment of insulin secretion and defects in insulin action frequently coexist in the same patient, and it is often unclear which abnormality, if either alone, is the primary cause of the hyperglycemia ***(American Diabetes Association, ٢٠١٠).***