Study of CA19-9 and CEA in Type 2 Diabetes Mellitus

Thesis
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BY

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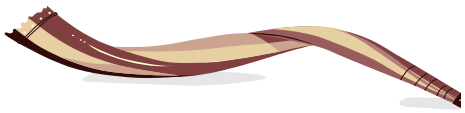

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List of Abbreviations

ACE	Angiotensin-converting enzyme
ADA	American diabetes association
AFP	Alphafetoprotein
AGEs	Advanced glycation end products
ARBs	Angiotensin receptor blockers
BMI	Body mass index
CA15.3	Carbohydrate antigens 15.3
CA19-9	Carbohydrate antigen19-9
CAN	Cardiac autonomic neuropathy
CEA	Carcinoembryonic antigen
CIPD	Chronic Inflammatory Demyelinating Polyneuropathy
CLI	Critical limb ischemia
CRC	Colorectal carcinoma
CRP	C-reactive protein
CVD	Cardiovascular disease
DME	Diabetic macular edema
DNA	Deoxyribonucleic acid
DPN	Diabetic peripheral neuropathy
DR	Diabetic retinopathy
ECM	Extracellular matrix
ESKD	END-stage kidney disease
FPG	Fasting plasma glucose
GMB	The glomerular basement membrane
HbA1c	Glycosylated hemoglobin
HDL	High-density lipoprotein

HLA	Human leucocytic antigen
HNF	Hepatocyte nuclear factor
HOMA-IR	Homeostatic models assessment- insulin resistance
hsCRP	High-sensitivity C-reactive protein
IADPSG	International Association of Diabetes and Pregnancy Study Groups
IDDM	Insulin-dependent diabetes mellitus
IGF-I	Insulin like growth factor I
IGT	Impaired glucose tolerance
IL	Interleukin
IPF	Insulin promoter factor
IR	Insulin resistance
IRMAs	Intra-retinal microvascular abnormalities
LDL	Low density lipoprotein
LV	Left ventricular
MCP-1	Monocyte chemoattractant protein- 1
MELAS syndrome	mitochondrial myopathy, encephalopathy, lactic acidosis, and stroke-like syndrome
MetS	Metabolic syndrome
MI	Myocardial infarction.
MNSI	Michigan Diabetic Neuropathy Screening Instrument
MODY	Maturity-onset diabetes of the young
NPDR	Non-proliferative DR.
OGTT	Oral glucose tolerance test
OPG	Osteoprotegerin
PAD	Peripheral arterial disease

PCO	Polycystic ovary
PDR	Proliferative DR
PKC	Protein kinase C
PSA	Prostate specific antigen
RBP4	Retinol binding protein
TNF-a	Tumor necrosis factor alpha
TRAIL	Tumor necrosis factor–related apoptosis inducing ligand
tRNA	Transfer ribonucleic acid
UKPDS	United Kingdom Prospective Diabetes Study
VEGF	Vascular endothelial growth factor

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Introduction

Type II DM compromises an array of dysfunctions resulting from the combination of resistance to insulin action and inadequate insulin secretion **(Romesh, 2003).**

Type II diabetes mellitus constitutes *about* 85% to 95% of all diabetes cases in developed countries and accounts for an even higher percentage in developing countries mostly due to increased urbanization, westernization and economic development, which predispose to obesity due to high consumption of industrialized foods and physical inactivity **(Wild et al., 2009).**

The chronic hyperglycemia of diabetes associated with long term damage, dysfunction and failure of various organs especially the eyes, kidney, heart and blood vessels **(American diabetes association, 2009)**.

Patients with insulin resistence and early type II DM exhibit an increased tendency to develop a diffuse and extensive pattern of arteriosclerosis leading to a remarkable increase in vascular complications including myocardial infarction and stroke **(Walcher and Marx, 2009)**.

Carcinoembryonic antigen (CEA) is a glycoprotein involved in cell adhesion. It is normally produced during fetal development, but the production of CEA stops before

birth,Therefore, it is not usually present in the blood of healthy adults, although levels are raised in heavy smokers, alcoholics, inflammatory conditions and in patients with malignancies like ovarian tumors, prostatic tumors and gastrointestinal malignancies **(Thomas et al., 2009).**

CA 19-9 is a tumor-associated antigen that was originally defined by a monoclonal antibody produced by a hybridoma prepared from murine spleen cells immunized with a human colorectal cancer cell line. Although increased CA 19-9 level is known to be associated with pancreatic cancer in particular, it has been also shown to increase in many malignant diseases such as upper gastrointestinal tract, ovarian, hepatocellular and colorectal cancer. In addition, various studies have reported increased CA 19-9 levels in benign diseases such as inflammatory conditions of hepatobiliarysystem, thyroid diseases, acute or chronic pancreatitis, interstitial pulmonary diseases, hydronephrosis and diabetes mellitus **(Petit et al., 2007).**

Patients with diabetes were shown to have increased CA 19-9and CEA levels. It was suggested that hyperglycemia may play a role in high CA 19-9 and CEA levels in these patients **(Uygur et al., 2007).**

Aim of the Work

To evaluate serum CA19-9 and CEA levels in patients with type II DM in relation to metabolic control and microvascular complications in these patients.

Diabetes Mellitus

Diabetes mellitus (DM) is defined as a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Chronic hyperglycemia is associated with long-term damage, dysfunction and failure of various organs, especially the eyes, kidney, nerves, heart and blood vessels **(Balkau and Eschwege, 2003).**

DM is a primary disease of carbohydrate metabolism due to deficient/absences of insulin has propensity towards vascular endothelial dysfunction resulting into micro and macroangiopathy. In the last two decades our understanding about hyperglycemia and its consequences has increased dramatically. The management of diabetes has changed from glucocentric to organo protective and specially the vascular endothelium, which could lead cardiovascular complications **(Manish et al., 2011).**

DM compromise a group of common metabolic disorders showing the phenotype of hyperglycemia.several distinct types of DM exist caused by interaction of genetics,enviromental factors and lifestyle choices, factors contributing to hyperglycemia may include reduced insulin secretion, decreased glucose utilization and increased glucose production **(Larry, 2006).**