

AMYLIN AND ITS RELATION TO INSULIN AND LIPID PROFILE IN OBESE CHILDREN BEFORE AND AFTER WEIGHT LOSS

Thesis

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قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

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List of Abbreviations

ABCA1		ATP-binding cassette A1
ACRP30		Adipocyte Complement Related Protein of 30 kD
AgRP	.....	Agouti gene related protein
AMY	.....	Amylin
AN	.....	Acanthosis nigricans
ASIP	.....	Agouti-Signaling protein
BBS	.....	Bardet-Biedl syndrome
BMI	.....	Body mass index
BP	.....	Blood pressure
CCK	.....	Cholecystokinin
CDC	.....	Centers for Disease Control and Prevention
CETP	.....	Cholesteryl ester transfer protein
cGMP	.....	Cyclic guanosine monophosphate
CGRP	.....	Calcitonin gene related peptide
Chol	.....	Cholesterol
CL–RAMP		Calcitonin receptor-like receptor/ receptor activity-modifying protein
CMI	.....	Comprehensive multidisciplinary intervention
COOH	.....	Carboxyl group
C-peptide	...	Connecting peptide
CRP	.....	C-reactive protein
CT	.....	Calcitonin
DHEA-S	.....	Dehydroepiandrosterone-sulfate
DRG	.....	Diagnosis-related group

EDTA..... Ethylenediaminetetraacetic acid
ELISA..... Enzyme-linked immunosorbent assay
EMCL..... Extramyocellular lipid
FA Fatty acid
FDA Food and Drug Administration
FDA Food and Drug Administration
FFA..... Free fatty acid
FGIR..... Fasting glucose/ insulin ratio
FPG..... Fasting plasma glucose
FSH..... Follicle-stimulating hormone
GI Glycemic index
G-protein... Guanine nucleotide-binding protein
GRD..... Glycoregulation disorders
GSK-3..... Glycogen synthase kinase 3
HDL High-density lipoprotein
HEK-293 ... Human embryonic kidney 293
HL Hepatic lipase
HOMA..... Homeostatic model assessment
HSP-70..... Heat shock protein 70
HSPGs Heparan sulfate proteoglycans
IAPP Islet amyloid polypeptide
IDF..... International Diabetes Federation
IFG..... Impaired fasting glycemia
IGF-I..... Insulin growth factor 1
IGT Impaired glucose tolerance

IMCL..... Intramyocellular lipid
IOM Institute of Medicine
IR Insulin Resistance
ISI Insulin sensitivity index
L-364718.... CCK antagonist
LCAT..... Lecithin:cholesterol acyltransferase
LC-CoA..... Long-chain fatty acyl-CoA
LDL Low-density lipoprotein
LDLR..... Low-density lipoprotein receptor
LH..... Luteinizing hormone
LPL Lipoprotein lipase
LRP LDLR-related protein
LRP LDLR-related protein
MC3R Melanocortin receptor-3
MC4R Melanocortin 4 Receptor
MRI Magnetic Resonance Imaging
mRNA..... Messenger ribonucleic acid
MS Metabolic syndrome
MTP..... Microsomal triglyceride protein
MUP..... 4-Methylumbelliferyl Phosphate
NCEP/ATP III The third report of the National Cholesterol
 Education Program Adult Treatment Panel
NEFA..... Nonesterified fatty acids
NHANES... National Health and Nutrition Examination Study
NIBSC National Institute for Biological Standards and
 Control

NIDDM.....Non insulin dependent diabetes mellitus
NPYNeuropeptide Y
OGTTOral glucose tolerance test
OSAObstructive sleep apnea
PCOSPolycystic ovary syndrome
POMCPro-Opiomelanocortin
PSMFProtein-sparing modified fast
PWSPrader-Willi syndrome
PYYPeptide YY
QUIKIQuantitative insulin sensitivity check index
RAMPReceptor activity modifying protein
RERRough endoplasmic reticulum
sCT8-32Salmon calcitonin 8-32
SD.....Standard deviation
SER.....Smooth endoplasmic reticulum
SES.....Socioeconomic status
SFASaturated fatty acids
SI.....Insulin sensitivity index
SPSS.....Statistical Package for Special Science
SR-BIScavenger receptor class B, type I
SWM.....Structured weight management
T2DMType 2 diabetes mellitus
T3Triiodothyronine
T4Thyroxine
TBFTotal body fat

TC Total cholesterol
TCI..... Tertiary care intervention
TG Triglycerides
TNF..... Tissue necrotizing factor
TRLs Triglyceride-rich lipoproteins
TSH..... Thyroid-stimulating hormone
USDA..... United states Department of Agriculture
VLDL..... Very low-density lipoprotein
VMH..... Ventromdial hypothalamus
WC..... Waist circumference
WHO World Health Organization
WLIP Weight loss intervention program
 α -MSH α -melanocyte stimulating hormone

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Introduction

Childhood obesity has reached epidemic levels in developed countries. Twenty five percent of children in the United States are overweight and 11% are obese (**Whitaker et al., 1997**). The frequency of obesity continues to rise in our country; **Salem et al. (2002)** reported that the prevalence of obesity was 14.7%-15.08% for male and female children adolescents.

Obesity is the most common cause of insulin resistance. Insulin resistance is the keystone of the “Metabolic syndrome” a major cardiovascular risk factor even in the absence of demonstrable glucose intolerance or diabetes (**Bouchard, 2004**). Moreover, it is associated with abnormal levels of blood lipids (**Pi-Sunyer, 1993**).

Amylin, also known as islet amyloid peptide, identified in 1987, is a naturally occurring hormone, released by the B cells of the pancreas and consists of 37 amino acids. It seems to decrease food intake through both central and peripheral mechanisms (**Reda et al., 2002**).

A role for amylin has been suggested in the pathogenesis of dyslipidemia and impaired glucose metabolism. Moreover, amylin can reduce chylomicron uptake, most probably by regulating lipoprotein receptors either directly or via modulation of insulin activity (**Smith and Mamo, 2000**).