Assessment of glycemic control In infant of diabetic mother

Thesis

Submitted for partial fulfillment of Master Degree

In Pediatric

By

Eman Ahmed Mahmoud Abdel Rehim

M.B.B.CH

Under Supervision of

Prof.Nehal Mohamed EL-Raggal

Professor of Pediatric

Faculty of Medicine-Ain Shams University

Dr.Nancy Mohamed Abou-Shady

Lecturer of Pediatric

Faculty of Medicine-Ain Shams University

Dr.NohaMohamedRefaat

Lecturer of Clinical Pathology

Faculty of Medicine-Ain Shams University

Faculty of Medicine

Ain Shams University

2013

Acknowledgment

I would like to express my sincere gratitude and appreciation to **Prof. Dr. Nehal Mohamed EL-Raggal** professor of Pediatric Faculty of Medicine,Ain Shams University for her continuous guidance, valuable advice and support throughout the execution of this work it was a great honor to work with her.

I also express my deep thanks and gratitude to **Dr. Nancy Mohamed Abou shady** Lecturer of Pediatric, Faculty of Medicine, Ain Shams University, for her great support, encouragement, patience and help, without which this work would have never seen light.

Also my deep thanks to **Dr. NohaMohamedRefaat** Lecturer of Clinical Pathology, Faculty of MedicineAin Shams University,for her great cooperation and generous help.

Lastly. I would like to thank all members in my family specially, my father and my mather, for pushing me forword all the time.

My, all thanks to all mothers of the newborns and all members in hospital who helped me in this work.

Eman Abdel Rehim

سورة البقرة الآية: ٣٢

Contents

List of Abbreviations

1,5-AG	:	1,5-anhydroglucitol
67 KDa	:	unified atomic mass unit
6q24	:	q arm of 6 chromosome
HbAc	:	Glycated hemoglobin.
ABCC8	:	ATP-binding cassette, sub-family C (CFTR/MRP), member 8
AD	:	Alzheimer's Disease.
ADA	:	American Diabetes Association
AGEs	:	Advanced glycation end products
AP-1	:	Activator factor Protein-1
Ca	:	Calcium
CAD	:	Coronary artery disease
CSF	:	Cereprospinal fluid
DCCT	:	Diabetes Control and Complications Trial
BMI	:	Body mass index
DKA	:	Diabetic ketoacidosis.
DM	:	Diabetes Mellitus.
OGTT	:	Oral glucose tolerance test
EPO	:	Erythropoietin.
ER Kinase	:	endoplasmic reticulum kinase
ESRD	:	end-stage renal disease
FA	:	Fructosamine

FPG	:	Fasting plasma glucose
G-Alb	:	Glycated albumin
GCK	:	Glucokinase
GDM	:	Gestational diabetes mellitus.
HbA1c	:	Glycosylated hemoglobin
HbA2	:	Adult hemoglobin
HbF	:	Fetal hemoglobin
PGDM	:	Pregestational diabetes mellitus
PONDE	:	Ponderal index
IDDM	:	Insulin dependent diabetes mellitus.
IGT	:	Intolerance glucose test
INS	:	Insulin
IPEX Syndrome	:	Immunodysregulation,polyendocrinopathy,and enteropathy,x-linked
IPF1(PDX1)	:	pancreatic agenesis and insulin promoting factor 1
IUGR	:	Intruterine growth retardation
K ATP	:	ATP-sensitive potassium channel
K-ATP	:	Potassium mediated adenosine triphosphate
KCNJ11	:	potassium inwardly-rectifying channel, subfamily J, member 11.
KIR.2,6	:	Inwardly retifying potassium channel .
LDL	:	Low denisity lipo protein
MODY	:	Maturiy onset diabetes of young

NDM	:	Neonatal diabetes mellitus
NF	:	Necrosis factor
NIDDM	:	Non Insulin dependent diabetes mellitus.
NPH	:	Neutral Protamine Hagedorn
OGTT	:	Oral glucose tolerance test
GHB%	:	Glycated hemoglobin
PDR	:	proliferative diabetic retinopathy
MBG	:	Maternal blood glucose
PNDM	:	Permenant neonatal diabetes mellitus
PTF1A	:	Pancreas Transcription Factor 1 Alpha
PVD	:	Peripheral Vascular Disease.
RAGE	:	Receptors for Advanced Glycation End Product.
NBG	:	Neonatal blood glucose
RBCs	:	Red blood cells
ROC	:	Receiver Operator Characteristics curve
SDA	:	small for gestational age
SMBG	:	Self monitoring of blood glucose
SUR1	:	sulfonylurea receptor 1
TGF	:	Transforming growth factor
TNDM	:	Transient neonatal diabetes mellitus
U.S	:	United States
UKPDS	:	United Kingdom Prospective Diabetes Study
UPD	:	uniparentaldisomy

VEGF	:	Vascular Endothelial Growth Factor
WHO	:	World health organisation
ZAC1	:	Zinc finger
ZFP57	:	(Zinc finger) protein regulating apoptosisand cell cycle arrest.
GA	:	Gestational age
LGA	:	Large gestational age
NICU	:	Neonatal intensive unit
IGF-1	:	Insulin-like growth factor-1
FGF-2	:	Fibroblast-growth factor-2
RDS	:	Respiratory distress syndrome
(NSLCS)	:	Neonatal small left colon syndrome

List of Tables

List of figures

Introduction

Diabetes mellitus (DM) is a group of metabolic diseases characterized by chronic hyperglycemia resulting from defects in either insulin secretion or 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***(ADA, 2010).***

Gestational Diabetes (diabetes that begins during pregnancy) can develop in overweight, hyperinsulinemic, insulin-resistant women or in thin relatively insulin-deficient women. Gestational diabetes ocurrs in 1 to 3% of all pregnancies but the rate may be much higher in certain groups (eg, Mexican, American, Indians, Asians, Pacific Islands) ***(Thomas, 2005).***

Pregnancy aggrevates preexisting typeI (insulin-dependent) diabetes and type II (non insulin-dependent) diabetes but does not appear to exacerbate diabetic retinopathy, nephropathy, or neuropathy. Diabetes during pregnancy increases fetal and maternal morbidity and mortality***(Ogata, 2010).***

Neonates of diabetic mother are at risk of respiratory distress, hypoglycemia, hypocalcemia, polycythemia, hyperbilirubinemia and hyperviscosity. Poor control of

preexisting or gestational diabetes increases risk of major congenital malformations and spontaneous abortion ***(Ogata, 2011).***

Hyperglycemia induces non-enzymatic glycation reactions in proteins which generates amadoric products and advanced glycation end-products; the latter are thought to participate in the vascular complications of diabetic patients ***(Ahmed, 2005).***

Glycosylated hemoglobin is increased in the red blood cells of persons with poorly controlled diabetes mellitus, since the glucose stays attached to hemoglobin for the life of the red blood cells, so the level of the glycosylated hemoglobin reflects the average blood glucose level over the past 3 months ***(Ruchi and William, 2010).***