Vitamin D Status among Egyptian Pregnant Women with Gestational Diabetes Mellitus

Thesis

Submitted for partial fulfillment of the master degree
in Endocrinology and metabolism

By

Faiza Ali Mouftah Emazeg
M.B.B.CH

Supervised by

Prof. Dr. Mohamed Saad Hamed
Professor of Internal Medicine, Diabetes and Endocrinology
Faculty of Medicine-Ain Shams University

Dr. Maram Mohamed Maher Mahdy
Ass. Professor of internal Medicine, Diabetes and Endocrinology
Faculty of medicine-Ain Shams University

Dr. Amr Helmy Yehia
Lecturer in Obstatrics and Gynaecology
Faculty of Medicine-Ain Shams University

Faculty of Medicine
Ain-Shams University
2016

سورة البقرة الآية: ٣٢

Acknowledgments

My thanks are submitted first and foremost to **ALLAH** *Who gave me the strength and ability to complete this work.*

I would like to express my thanks and appreciation to **Prof. Dr. Mohamed Saad Hamed,** *Professor of Internal Medicine, Diabetes and Endocrinology, Faculty of Medicine-Ain Shams University, for his candid opinions, timely feedback, insights and the effort and time he has devoted to the fulfillment of this work. I am indebted to his meticulous follow-up and constructive criticism.*

My sincere gratitude and appreciation are also due to **Dr. Maram Mohamed Maher Mahdy,** *Ass. Professor of internal medicine, Diabetes and Endocrinology, Faculty of medicine-Ain Shams University, for her kind help, constant encouragement, constructive criticism, and the time and effort she dedicated to this work.*

I can't forget to thank with all appreciation, **Dr. Amer Helmy Yehia,** *Lecturer in Obstatrics and Gynaecology, Faculty of Medicine-Ain Shams University, for the efforts and time he has devoted to accomplish this work.*

Last but not least, all thanks to all members of my **Family**, *especially, my* **Husband** *and my* **Mother,** *for pushing me forward in every step in the journey of my life.*

Faiza Ali Mouftah Emazeg

List of Contents

List of Abbreviations

Abbr.	Full-term
AAP	: American Academy of Pediatrics
ACOG	: American College of Obstetricians and Gynecologists
ADA	: American Diabetes Association.
ADIPS	: Australasian Diabetes in Pregnancy Society
AMPK	: Adenosine monophosphate-activated protein kinase
BIAsp	: Biphasic insulin aspart
BMI	: Body mass index
Ca	: Calcium
CAT	: Choline acetyltransferase
CGMS	: Continuous glucose monito ring system
CI	: Confidence interval
CNS	: Central nervous system
CSIF	: Cytokine synthesis inhibitory factor
DBP	: Vitamin D binding protein
DM	: Diabetes mellitus.
dRTA	: Distal renal tubular acidosis
Enzyme Vmax	: maximal velocity.
FAD	: Food and drug administration.
FBG	: Fasting blood glucose.
FDA	: Food and Drug Administration
FGF	: Fibroblast growth factor.
GABA	: Gama amino butyric acid.
GDM	: Gestational diabetes mellitus
GDNF	: Glial cell line-derived neurotrophic factor
GSH	: Glutathione

HAPO : Hyperglycemia and adverse pregnancy outcomes
HbA1c : Glycosylated hemoglobin
HbAic : Glycosylated hemoglobin.
HIV : human immune virus.
HOMA-R : Homeostasis model assessment for insulin resistance.
IADPSG : International association of diabetes and pregnancy study group.
IF-γ : Interferon γ
IGT : Impaired glucose tolerance
IL : Interleukin
IOM : Institute of medicine
IU : International unit
KDOI : Kidney dialysis outcome initiative.
Km enzyme : Michaelis constant
LGA : Large for gestational age
MAPkinase : Mitogen-activated protein kinase.
MARRS : Membrane associated rapid response steroid-binding receptors.
MIG : Metformin in gestational diabetes
miRNAS : Micro RNAs
MNT : Medical nutritional therapy
MPC : Model predictive control
MPG : Mean plasma glucose
mRNA : Messenger RNA
MS : Multiple sclerosis
ncRNA : Non coding RNAs
NGF : Nerve growth factor
NHANES : National Health and Nutrition Examination Survey
NICE : National Institute for Health and Care Excellence

NMDA : N-methyl-D-aspartate
NOS : Nitric oxide synthase
NPH : Neutral protamine hagedorn
OGTT : Oral glucose tolerance test
OHAs : Oral hypoglycemic agents
OR : Odd Ratio.
PCOD : Polycystic ovarian disease
PCOS : Polycystic ovary syndrome
PGLs : Plasma glucose levels
PLC : Phospholipase c.
PTH : Parathyroid hormone
RCTs : Randomized controlled trials
RHI : Regular human insulin.
RNA : Ribonucleic acid
ROS : Reactive oxygen species
RR : Relative risk
SD : Standard deviation
SHPT : Secondary hyperparathyroidism
SMBG : Self-monitoring of blood glucose
SOCE : Store-operated calcium entry
SPSS : Statistical Program for Social Science
STIM : Stromal interaction molecule
TH : Tyrosine hydroxylase
UL : Upper intake level.
UVB : Ultraviolet B radiation
VBP : Vitamin binding protein
VDR : Vitamin D receptor
VDRE : Vitamin D responsive elements

Vitamin D : 1alfa,25(OH)2D
WHO : World Health Organization
1-OHase : 1-alfa hydroxylase
25-OHase : 25-hydroxylase
7-DHC : 7-dehydrocholesterol.

List of Tables

List of Figures

ABSTRACT:

Evidence is accumulating for a role of vitamin D in maintaining normal glucose homeostasis. However, studies that prospectively examined circulating concentrations of 25-hydroxyvitamin D (25-[OH] D) in relation to diabetes risk are limited. Our objective is to determine the association between maternal plasma 25-[OH] D concentrations in 26-29 weeks of pregnancy and the risk for gestational diabetes mellitus (GDM).

Our objective to determine the association between maternal 25(OH)D concentration in 26-29wk and the risk of GDM.

Method:case control study was conducted on90 egyptian pregnant womens,60 was GDM,30 was control.

Result:

The data were statistically analysed and it is found that:

- The mean+SD vitamin D levels were 15.93+3.91 in GDM patient and 23.63+5.18 in control women.

- 25(oH)D insufficient in group 1 GDM was 18(30%),and in group 2 control 7(23.3%).

- 25(oH)D deficient in group 1 GDM 42(70%),and in group 2 control 7(32.5%).

- There wasa negative correlation and significant between maternal serum 25(oH)D and weight prepregnancy P value=0.043,BMI P=0.042,HbAic P=0.005, fasting blood

glucose P=0.005,fasting insulin p=0.013 and HOMAIR p=0.026.and positive correlation and significant with serum calcium P=0.013.

Conclusion:there is statistically significant negative correlation between vitamin D level and glycemic control(FBS,HbAic) fasting insulin and HOMAIR,also there is a high prevalence of vitamin D deficiency and insufficiency in pregnant women.

KEY WORDE:

25(OH)D=25 hydroxy vitamin D,GDM=gestational diabetes mellitus,insulin R=insulin resistance.