Study on placental prostate-specific antigen in preeclamptic Egyptian women

Thesis Submitted by

May Malak M. Tadros
(M.Sc. in Biochemistry, 2012)

For the Award of the Degree of Doctor of Philosophy in Biochemistry

Under Supervision of

Prof. Dr. Nadia Y. S. Morcos
Prof. of Biochemistry
Biochemistry Department
Faculty of Science
Ain Shams University

Dr. Mahmoud M. S. Abd El-Hamid
Assistant Prof. of Biochemistry
Biochemistry Department
Faculty of Science
Ain Shams University

Dr. Fady M. Benjamine
Lecturer of General Surgery
Faculty of Medicine
Ain Shams University

Ain Shams University
Faculty of Science
Biochemistry Department

2016

Declaration

This thesis has not been submitted for a degree at this or any other university

May Malak M. Tadros

Dedication

To my husband, my daughter, my father,
my mother, my brother,
&
My real friends
Their love, encourage, help and prayers
made studies possible and to them I owe
everything.

Acknowledgement

I would like to thank from all of my heart and from my deep soul ***Dr. Nadia Y. S. Morcos***, Professor of Biochemistry, Faculty of Science, Ain Shams University, to whom I am so grateful for her endless help, motherly attitude, creative thinking, valuable suggestions and constant advice during this work. Without her support, the performance of this work would be difficult.

I am so grateful to ***Dr. Mahmoud M. Said Abd El-Hamid***, Assistant Professor of Biochemistry, Biochemistry Department, Faculty of Science, Ain Shams University for his spiritual and practical guidance, his enthusiastic encouragement and revising every detail, as well as profound reading of the manuscript.

Thanks are also due to ***Dr.Fady M. Benjamine***, Lecturer of General Surgery, Faculty of Medicine, Ain Shams University for his cooperation and kind help in samples collection.

Thanks are also due to my husband ***Dr. Joseph Magdy*** (Obstetrician-Gynecologist) for his cooperation, encouragement and kind help in this work.

My deep thanks and regards are also due to the staff members of the Biochemistry Department, Faculty of Science, Ain Shams University for their support and help.

May Malak

Biography

Name: May Malak Matter Tadros

Date and place of birth: 14/5/1987, Cairo, Egypt

Date of Graduation: 2008

Degree Awarded: M.Sc. in Biochemistry, 2012

Grade: Ph.D. in Biochemistry

Contents

Study on placental prostate-specific antigen in preeclamptic Egyptian women

May Malak M. Tadros

Abstract

The present study was undertaken to elucidate the mechanisms for the pathogenesis of preeclampsia (PE) in Egyptian women. To fulfill the target of the study, a total of fifty women at delivery were recruited, including twenty five pregnant women with preeclampsia and twenty five normotensive pregnant females. The biomarkers studied included blood pressure, complete blood picture, albuminuria as well as placental prostate specific antigen (PSA), 17-β estradiol (E2), interleukin-6 (IL-6), lipid peroxidation (MDA), glutathione peroxidase (GPx) and trace elements (Zinc, Copper and Calcium).

Our results demonstrated a significant difference in the systolic blood pressure ($p<0.001$), diastolic blood pressure ($p<0.001$), albuminuria ($p<0.001$), platelets ($p<0.049$), hemoglobin ($p<0.014$), placental PSA ($p<0.002$), IL-6 ($p< 0.05$) and 17-β estradiol ($p<0.012$) in preeclamptic women

compared with normotensive pregnant women. In addition, a positive correlation was recorded between placental PSA and each of systolic blood pressure, diastolic blood pressure, platelets and albuminuria whereas a negative correlation was recorded between placental PSA and each of placental IL-6 and 17-β estradiol.

In conclusion, the results of the current study indicate that the correlation between placental PSA and 17-β estradiol may give us a new understanding of the pathogenesis whereas the decreased placental 17-β estradiol is likely due to an alteration in the aromatase pathway which leads to an increase in the level of androgen with a subsequent increase in the PSA.

List of Tables

List of Figures

List of abbreviations

AF : Amniotic fluid
ALX : Lipoxin A_4 receptor
AT1 : Angiotensin II type 1
AT_1-AA : Agonistic autoantibodies
AT_1R : Angiotensin II type I receptor
AUC : Area under the curve
bFGFs : Basic fibroblast growth factors
BMI : Body mass index
Ca : Calcium
CBC : Complete blood picture
CO_2 : Carbon dioxide
COMT : Catechol-O-methyl transferase
COX2 : Cyclooxygenase 2
Cu : Copper
DBP : Diastolic blood pressure
E_2 : 17-β estradiol
E_1 : Estrone
E_3 : Estriol
EGF : Epidermal growth factor
eNOS : Endothelial nitric oxide synthase
FGR : Fetal growth restriction
FLT-1 : Fms-related tyrosine kinase 1
FPSA : Free prostate specific antigen
GPx : Glutathione peroxidase
H_2O_2 : Hydrogen peroxide
HB : Hemoglobin
HbA1c : Glycated hemoglobin
hCG : Human chorionic gonadotropin
HDL-C : High density lipoprotein cholesterol
HIV : Human immunodeficiency virus
HLA-C : Killer immunoglobulin receptor ligands present on trophoblasts
HO : Hemooxygenase
HO-1 : Heme oxygenase-1
HRP :Horseradish peroxidase
ICSI : Intracytoplasmic sperm injection
IFN γ : Interferon gamma
IGF-1 : Insulin-like growth factor-1
IL-2 : Interleukin-2
IL-6 : Interleukin-6
IQR : Interquartile range