SERUM C-REACTIVE PROTEIN IN WOMEN WITH PREECLAMPSIA

THESIS SUMITTED FOR
FULFILLMENT OF M.S.c DEGREE IN
OBSTETRICS & GYNECOLOGY
by

Shimaa Mostafa Abd Al Fattah
M.B.B.CH.
Resident of Obstetrics and Gynecology
kasr AL-Aini hospital
Supervised by

Dr.Mohamed Hany Shehata
Professor of Obstetrics and Gynecology
Cairo University

Dr. Mohamed Hamam Abd Manaf
Lecturer of Obstetrics and Gynecology
Cairo University

Dr.Sarah Adel Labeb
Lecturer of clinical pathology
Cairo University

Faculty of Medicine
Cairo University

2011

بسم الله الرحمن الرحيم

" قالُوْا سُبْحَانَكَ لا عِلْمَ لَنَا إلا مَا عَلَّمْتَنَا إنَّكَ أنْتَ العَلِيمُ الحَكِيمُ "

صدق الله العظيم

(البقرة – الآية ٣٢)

Abstract

Pregnancy induced hypertension (PIH) is the most frequent complication in pregnancy after the 20th week of gestation. This form of hypertension is classified as preeclampsia (PE) and gestational hypertension (GH). The latter is defined as the acute development of hypertension in a woman whose blood pressure (BP) was normal in the early stages of pregnancy and who subsequently developed persistent elevation of BP to at least 140/90 mmHg. Both GH and concomitant 24 hours Proteinuria (0.3 gm/L or more) in the absence of urinary tract infection is defined as PE ***(Ronald et al., 2007)***.

The condition of PE is the main cause of maternal and perinatal mortality ***(Buchbinder et al., 2002)***.

Preeclampsia develops in 4–5% of human pregnancies. It is characterized by an elevated blood pressure and Proteinuria and develops after 20 weeks of gestational age. PE can result in eclampsia when convulsions develop or manifest as the hemolysis, elevated liver enzymes and low platelet count (HELLP) syndrome. ***(Van Wijk et al., 2000)***.

Several etiologies have been implicated in the development of preeclampsia. Endothelial dysfunction or inappropriate endothelial cell activation are the most common clinical manifestations in preeclampsia, including enhanced endothelial-cell permeability and platelet aggregation ***(Wang et al., 2004)***.

Endothelial dysfunction is accompanied by elevated levels of inflammatory markers such as CRP ***(Teran et al., 2001)***. C-reactive protein (CRP) is an objective and sensitive index of overall inflammatory activity in the body ***(Kluft and Maat, 2002)***. There had been a growing interest in the role of inflammation as a key factor of endothelial dysfunction. A generalized activation of circulating leukocytes, characteristic of inflammation, has been found during preeclampsia ***(Redman et al., 1999)***.

Key words: SERUM C-REACTIVE PROTEIN - WOMEN WITH PREECLAMPSIA

ACKNOWLEDGEMENT

First and above of all, thanks to the merciful ALLAH for helping me to finish this work, and for the great countless gifts I have been offered throughout my life, then my family; my father, my mother, my sisters and my brother for their continuous encouragement, support and praying that lights my way throughout my life.

It is a great honor to express my sincere thanks, deep gratitude and appreciation to Prof. Dr. Mohamed Hany Shehata Professor of Obstetrics & Gynecology, Faculty of Medicine, Cairo University for his encouragement, creative suggestions, fatherhood and whole hearted support, both scientific and moral and for his valuable guidance throughout this work.

My words fail to express my sincere thanks and deep gratitude to Dr. Mohamed Hamam Abd Manaf Lecturer of Obstetrics & Gynecology, Faculty of Medicine, Cairo University for his energetic help spending long hours in careful review of this work following its details with constructive advice and criticism.

I would like to express my sincere appreciation to Dr.Sarah Adel Labib lecturer of Clinical Pathology, Faculty of Medicine, Cairo University for her kind encouragement and great help in performing this study.

Finally, I can never forget to express the profound thanks and appreciation to all my friends who helped me with special thanks to my family, for their great effort and support they offered in performing this work.

Shimaa Mostafa Abd Al Fattah.

List of Contents

Page

List of Tables

List of Figures

Figure ***Page***

List of abbreviations

ACE: angiotensin converting enzyme

ACOG: American College of Obstetricians and Gynecologists

AFP: Alfa feto-protein.

ANP: Atrial natruretic peptide

ARBs: angiotensin receptor blocker

AT: Angiotesin

b.i.d: two times daily.

BMI: Body Mass Index

CRP: C-reactive protein

CVD: cardiovascular

DBP: diastolic blood pressure

DIC: disseminated intravascular coagulopathy.

Eff: efficacy

FHR: fetal heart rate

FN: false negative.

GA: Gestation Age.

GFR: glomerular filtration rate.

GH :gestational hypertension.

HCG: Human Chorionic Goanadotrophin

HDL: High-Density Lipoprotein.

HLA: Human Leucocytic Antigen

HPL: Human Placental Lactogen

Ht: height.

IL: Interleukin

IRR: incidence rate ratio.

IUGR: Intra Uterine Growth Restriction

LDH: lactate dehydrogenase.

LDL: low-Density Lipoprotein.

MAP: Mean arterial pressure

NDL: non diagnostic line.

NHBPEP: National High Blood Pressure Education Program

NK: Natural Killer

NOS: Nitric Oxide Synthetase.

PA preparation: intermediate release preparation.

PA: Plsminogen Activators.

PAF: Platelet Activating Factor

PAI: plasminogen activator inhibitor.

PE: preeclampsia

PECAM-1: Platelet Endothelial Cell Adhesion Molecule-1

PGF: placental growth factor.

PIH: Pregnancy Induced Hypertension

PO: per oral.

PROM: premature rupture of membrane.

ROC: receiver operating characteristic.

SAA: serum amyloid A protein

SAP: serum amyloid P component.

SBP: systolic blood pressure

SD: Standard Deviation

SGOT: Serum Glutamic-Oxaloacetic Transaminase.

SGPT: Serum Glutamic-Pyruvic Transaminase

SL preparation: slow release preparation.

SN: Sensitivity.

SP: specificity

t.i.d: three times daily.

TAT: thrombin-antithrombinIII complex.

TNF: Tumor Necrosis Factor

TP: true positive.

TTP: thrombotic thrombocytopenic purpura.

VEGF: vascular endothelial growth factor

Wt; weight.

XL: extended release preparation.

Introduction

INTRODUCTION

Pregnancy induced hypertension (PIH) is the most frequent complication in pregnancy after the 20th week of gestation. This form of hypertension is classified as preeclampsia (PE) and gestational hypertension (GH). The latter is defined as the acute development of hypertension in a woman whose blood pressure (BP) was normal in the early stages of pregnancy and who subsequently developed persistent elevation of BP to at least 140/90 mmHg. Both GH and concomitant 24 hours Proteinuria (0.3 gm/L or more) in the absence of urinary tract infection is defined as PE ***(Ronald et al., 2007)***.

The condition of PE is the main cause of maternal and perinatal mortality, low birth weight, and intrauterine growth restriction, whereas GH has been associated with increased rates of preterm delivery and small for gestational age infants ***(Buchbinder et al., 2002)***.

Preeclampsia develops in 4–5% of human pregnancies. It is characterized by an elevated blood pressure and Proteinuria and develops after 20 weeks of gestational age. PE can result in eclampsia when convulsions develop or manifest as the hemolysis, elevated liver enzymes and low platelet count (HELLP) syndrome. Both eclampsia and HELLP syndrome are known to be associated with severe complications such as cerebral hemorrhage, lung edema, renal insufficiency, and liver hemorrhage ***(Van Wijk et al., 2000)***.

Several etiologies have been implicated in the development of preeclampsia. Some of them include abnormal trophoblast invasion of uterine blood vessels, immunological intolerance between fetoplacental and maternal tissues, maladaptation to the cardiovascular changes or dietary deficiencies and genetic abnormalities ***(Sibai, 2003)***. Endothelial dysfunction or inappropriate endothelial cell activation are the most common clinical manifestations in

preeclampsia, including enhanced endothelial-cell permeability and platelet aggregation ***(Wang et al., 2004)***.

Endothelial dysfunction is accompanied by elevated levels of inflammatory markers such as CRP ***(Teran et al., 2001)***. C-reactive protein (CRP) is an objective and sensitive index of overall inflammatory activity in the body ***(Kluft and Maat, 2002)***. There had been a growing interest in the role of inflammation as a key factor of endothelial dysfunction. A generalized activation of circulating leukocytes, characteristic of inflammation, has been found during preeclampsia ***(Redman et al., 1999)***.

In a cross sectional study, that was conducted at the Yuzuncu Yil University, Medical Faculty, Department of Obstetrics and Gynecology over a one year period on 112 primigravidas patients with gestational age 28–40 weeks, it was found that serum CRP levels were higher in women with PE than normotensive pregnant women at week 32 (5.1 mg/l versus 2.2 mg/l, P = 0.0007), and also were higher at delivery (5.9 mg/l versus 2.5 mg/l, P = 0.001) ***(Yusuf et al., 2005)***.

Another study, that was conducted at Severance Hospitals of Yonsei University Medical Center, Seoul, Korea on 202 healthy pregnant normotensive women and 25 women with severe PE, it had been reported that serum CRP levels were higher in preeclamptic women than in healthy pregnant normotensive women ***(Hwang et al., 2007)***.