CA-125 and Severity of Preeclampsia

Thesis
Submitted for the Partial Fulfillment of Master Degree
in Obstetrics and Gynecology

Presented By
Marwa Mohamed Ibrahim
M.B., B.Ch. Ain Shams University (2011)
Resident in Al-salam Specialized Hospital

Under Supervision of
Prof. Dr. Hassan Tawfek Khairy
Professor of Obstetrics and Gynecology
Faculty of Medicine – Ain Shams University

Dr. Sherif Hanafi Hussain
Assistant Professor of Obstetrics and Gynecology
Faculty of Medicine – Ain Shams University

Dr. Ahmed Mohamed Bahaa Eldin
Assistant Professor of Obstetrics and Gynecology
Faculty of Medicine – Ain Shams University

Faculty of Medicine
Ain Shams University
2017

Acknowledgment

First thanks to **ALLAH** to whom I relate any success in achieving any work in my life.

I wish to express my deepest thanks, gratitude and appreciation to *Prof. Dr. Hassan Tawfek Khairy,* Professor of Obstetrics and Gynecology Faculty of Medicine – Ain Shams University for his meticulous supervision, kind guidance, valuable instructions and generous help.

Special thanks are due to *Dr. Sherif Hanafi Hussain,* Assistant Professor of Obstetrics and Gynecology Faculty of Medicine – Ain Shams University Care for his sincere efforts, fruitful encouragement.

I am deeply thankful to *Dr. Ahmed Mohamed Bahaa Eldin,* Assistant Professor of Obstetrics and Gynecology Faculty of Medicine – Ain Shams University for her great help, outstanding support, active participation and guidance.

Marwa Mohamed Ibrahim

Dedication

This work is dedicated to . . .

My beloved father, to whom I owe everything I ever did in my life and will achieve.

My mother for always being there for me and all the nights she stayed with me.

My husband for being support me and God's gift to me, my backbone

Finally **my son** light of my life

بسم الله الرحمن الرحيم

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

List of Contents

$\mathscr{L}ist\ of\ \mathscr{T}ables$

Table No.	Title	Page No.

List of Tables cont...

List of Figures

List of Figures cont...

iv

List of Abbreviations

Abb.	Full term
ACOG	American College of Obstetricians and Gynecologists
ALT	Alanine aminotransferase
Ang-1	Angiopoietin-1
Ang-2	Angiopoietin-2
Ang-II	Angiotensin II
AST	Aspartate aminotransferase
AT1-AA	Angiotensin II type 1 receptor autoantibody
AT1-AB	Angiotensin II type 1 receptor antibody
BKCa++	Large conductance calcium-activated potassium channels
BMI	Body mass index
BP	Blood pressure
CA-125	Cancer Antigen-125
CNS	Central nervous system
CRP	C-reactive protein
CT	Computed Tomography
DIC	Disseminated intravascular coagulation
DM	Diabetes mellites
DNA	Deoxyribonucleic acid
ET-1	Endothelin-1
ffDNA	Free fetal DNA
GWLS	Genome-wide linkage analyses
hCG	Human chorionic gonadotropin
hCG-h	Hyperglycosylated human chorionic gonadotropin
HELLP	Hemolysis, elevated liver enzymes, low platelet count
HTN	Hypertension
IBI	Inter-birth interval
IL	Interleukin
IQR	Inter quartile range
IUFD	Intrauterine fetal demise
IUGR	Intrauterine growth restriction
IV	Intravenous
LMP	Last menstrual period

List of Abbreviations **cont...**

Abb.	Full term
MRI	Magnetic resonance image
NICU	Neonatal intensive care unite
NK..........................	Natural killer
NO	Nitric oxide
OC125....................	Ovarian cancer 125
OR	Odds Ratio
PAI-1	Plasminogen activator inhibitor-type 1
PAPP-A	Pregnancy-associated plasma protein-A
PCR	Polymerase chain reaction
PET	Preeclampsia
PI	Pulsatility index
PlGF	Placental growth factor
RI	Resistive index
RNA	Ribonucleic acid
ROC.......................	Receiver Operating Characteristic
ROS........................	Reactive Oxygen Species
RUPP	Reduced uterine perfusion pressure
SD..........................	Standard deviation
sFlt-1	Soluble fms-like tyrosine kinase-1
Siglec-9	Sialic acid-binding Ig-like lectin-9
SRD........................	Serous retinal detachment
sTie-2	Soluble endothelial cell-specific tyrosine kinase receptor-2
STOX-1	Storkhead box-1
sVEGFR-1..............	Soluble vascular endothelial growth factor receptor-1
TNF	Tumor necrosis factor
TPR........................	Total peripheral resistance
TX..........................	Thromboxane
US..........................	Ultra sonography
UVPI......................	Utero-Placental Vascular Insufficiency
VEGF	Vascular endothelial growth factor
WHO.......................	World Health Organization

Abstract

By statistically analyzing data, a positive correlation between preeclampsia and systolic blood pressure, diastolic blood pressure, platelets count and serum uric acid. A negative correlation between preeclampsia and gestational age at time of delivery. We found no significant correlation between preeclampsia and maternal age.

There is statistically significance between CA-125and preeclampsia for normal and mild group to sever group (P<0.01), but weak sensitivity (67.5%) and specificity(52.5%).

In pregnancy, serum CA-125 levels are increased in early pregnancy and immediately after birth implicating the disintegration of the maternal decidua (i.e., blastocyst implantation and placental separation) as a possible source of the tumor marker elevation.

This study was conducted at Ain Shams University Maternity Hospital to assess free serum CA-125in pregnant women with preeclampsia in the third trimester to find out possible relation between the level of CA-125and severity of preeclampsia.

Keywords: *Serous retinal detachment* **-** *Tumor necrosis factor- Vascular endothelial growth factor- World Health Organization*

INTRODUCTION

Pre-eclampsia, defined as hypertension and proteinuria after 20 weeks of gestation, affects approximately 2-8% of pregnant women and may lead to severe maternal and neonatal complications *(Duley, 2009).*

Preeclampsia with its complications such as prematurity, IUGR, perinatal asphyxia and abruptio placentae is one of major causes of maternal and fetal morbidity and mortality due to its morbid course so it is necessary to identify those at risk for the illness and take precautions *(Gerulewicz-Vannini et al., 2006).*

The etiology of preeclampsia is unknown, although several risk factors have been identified as primiparity, advanced maternal age ethnicity and multiple pregnancies. Recent studies show that treatment with low-dose aspirin may reduce the risk of early-onset preeclampsia, i.e., preeclampsia diagnosed before 34 weeks of pregnancy, which usually is a severe form of the disease *(Roberge et al., 2012).*

The pathophysiologic abnormalities of preeclampsia are numerous. Some of the reported abnormalities include abnormal implantation, generalized vasospasm, vascular endothelial dysfunction, angiogenic factors imbalance, immune and inflammatory mechanisms *(Redman et al., 2012).*

Several methods have been reported for the prediction of preeclampsia including maternal characteristics, doppler

ultrasound, calcium/creatinine ratio and serum uric acid. Other methods have been investigated recently as placental growth factor, soluble vascular endothelial growth factor receptor-1, soluble fms-like tyrosine kinase-1, soluble endoglin, free fetal nucleic acids, angiopoietins and pregnancy-associated plasma protein-A *(D'Anna et al., 2011)*.

CA-125 is one of the tumor markers in hybridoma family, the most widely used serum marker in the detection of ovarian tumor from surface epithelium *(Radka et al., 2013).*

Threshold concentrations of CA-125 in healthy person are below 35 IU/mL, CA-125 levels are increased in 80%-85% of women in the advanced stages of ovarian cancer and in 50% of women with stage I disease. Elevated serum levels of CA-125 are found in physiological conditions as menstruation and pregnancy and levels also increased in pathological conditions as endometriosis, fibroid, pelvic inflammatory disease, ovarian hyperstimulation syndrome, end-stage liver disease and a variety of gynecological and non-gynecological neoplasms *(Alper et al., 2007).*

In pregnancy, serum CA-125 levels are increased in early pregnancy and immediately after birth implicating the disintegration of the maternal decidua (i.e., blastocyst implantation and placental separation) as a possible source of the tumor marker elevation *(Ayaty et al., 2007).*

AIM OF THE WORK

Research hypothesis:

CA -125 may be elevated in pregnant women with preeclampsia.

Research question:

- In pregnant women with preeclampsia, dose serum CA-125 level elevate?

- The aim of this work is to study the changes in serum CA-125 level in pregnant women with preeclampsia.