Maternal Serum Homocysteine Level in Patients with Pre-elcampsia

Thesis

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قياس مستوى الهيموسيستين فى مصل مرضي
ما قبل الارتعاج

رسالة
توطئة للحصول على درجة الماجستير
فى أمراض النساء والتوليد

مقدمة من

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Summary and Conclusion

The aim of this study is to determine the level of plasma homocysteine in women with Pre-eclampsia and compare it with those of normal pregnancy in order to speculate the possible role of homocysteine in the pathogenesis of Pre-eclampsia.

The study was carried out at the Department of Obstetric and Gynecology in Ain Shams University Maternity Hospital on 75 pregnant women after 20 weeks gestation. They were classified into two cross matched groups:

1- **Case group:** was subdivided into two subgroups:

   Subgroup A: 30 women with mild Pre-eclampsia.

   Subgroup B: 30 women with sever Pre-eclampsia.

2- **Control group:** were included 15 normotensive healthy pregnant women.

All patients were primigravide with singleton pregnancy beyond 20 weeks of gestational age.

List of Contents

List of Abbreviations

AMD	Age-related macular degeneration
ANP	Atrial natriuretic peptide
AT III	Antithrombin III
BMI	Basal metabolic index
CBS	Cystathionine Beta-Synthase
CCAAT	Cytidine-cytidine-adenosine-adenosine-thymidine
CFN	Cellular fibronectin
CHD	Coronary heart disease
CHF	Congestive heart failure
CI	Calcium intake
CNS	Central nervous system
COMT	Catechol-O-methyltransferase
Cr	Creatinine
DBP	Diastolic blood pressure
EDRF	Endothelial Derived Relaxing Factor
ELIZA	Enzyme linked immunosobent assay
FAD	Flavin adenine dinucleotide
FB	False positive
FFA	Free fatty acids
G.age	Gestational age
GDM	Gestational diabetes mellitus
HCG	Human chrionic gonadotropin
Hcy	Homocysteine
HLA	human leucocyte antigen
HMW	High molecular weight
HPL	Human Placental Lactogen
IFNG	Interferon, gamma gene
IL	Interleukin
IUGR	Intrauterine growth restriction
IUK	Inactive urinary kallikrein

MHC	Major histocompitability molecule
MS	Methionine synthase
MTHF	Methyl Tetrahydrofolate
MTHFR	Methylene tetrahydrofolate reductase
MPE	Mild pre-eclampsia
MTX	Methotrexate
NAC	N-acetyl-cysteine
NK	Natural killer cells
NMDA	N-methyl-D-aspartate
NO	Nitric Oxide
NTD	Neural Tube Defects
P	Significance
PA	Plasminogen activators
PAI-1	Plasminogen Activator Inhibitor-1
PE	Pre-eclampsia
pI	Protease inhibitor
PIGF	Placental inhibiting growth factor
PLGF	Placental growth factor
PML	Post Methionine Load
r	Correlation
ROC	Receiver operating characteristic curve
ROS	Reactive oxygen species
RR	Reduced risk
SAM	S-Adenosylmethionine
SBP	Systolic blood pressure
sEng	Soluble endoglin
SFLt-1	Soluble fms like tyrosine kinase
SPE	Sever pre-eclampsia
SPSS	Statistical package of the social science
sVEGF	Soluble vascular endothelial growth factor
TcR	T cell receptor
Th1	T helper 1
tHcy	Total Homocysteine
THF	Tetrahydrofolate
TN	True negative

TNFα	Tumour necrosis factor alpha
TP	True positive
TxPA	Toxicity-preventing activity
UK	United Kingdom
V.C	Vasoconstriction
VCAM	Vascular cell adhesion molecule
VEGF	Vascular endothelial growth factor
VLDL	Very low density lipoprotein
Vs	Versus
VWF	Von Willibrand factor
WHO	World Health Organizaion

List of Figures

List of Tables

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بسم الله الرحمن الرحيم

قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا

إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

البقرة الآية ٣٢

Introduction

Pre-eclampsia, is a pregnancy-specific complication which occurs in the second half of pregnancy; it is characterized by hypertension and proteinuria, and is one of the leading causes for perinatal mortality and morbidity **(Redman and Sargent, 2005).**

The incidence of Pre-eclampsia is commonly cited to about 5- 10% of all pregnant women, although remarkable variations are reported that are influenced by parity, race, genetic predisposition, environmental factors, multiple pregnancy, obesity, maternal age and history of chronic hypertension **(Robert and Gammill, 2005).**

Although the pathogenesis of Pre-eclampsia remains unclear, the syndrome is characterized by impaired trophoplastic invasion of the spiral artery at 16-20 weeks of pregnancy resulting in the release of factors from the placenta that activate the maternal vascular endothelium **(Hogg et al., 2000 and Mark et al., 2004).**

Homocysteine is a sulfur containing amino-acid, primarily derived from demethylation of dietary methionine which is abundant in protein of animal origin, is an essential amino-acid required for the growth of cells and tissues in the human body, and elevated circulating homocystine is a risk

factor for endothelial dysfunction and occlusive vascular disorders **(Refsum et al., 1998).**

Hyperhomocysteinemia has been identified as a risk factor for Pre-eclampsia, placental abruption, intrauterine growth restriction and spontaneous miscarriage **(Kamedhamas et al., 2004).**

In hyperhomocysteinemia, homocysteine undergoes autooxidation to produce reactive oxygen species (Ros) which inactivate nitric oxide and thrombomodulin leading to endothelial damage and endothelial dysfunction **(Sydow et al., 2003).**

Maternal plasma homocysteine concentration was found to be significantly elevated in women with Pre-eclampsia compared to normotensive women during pregnancy particularly in severe Pre-eclampsia **(Napolitano et al., 2004 and Zeeman et al., 2003).**

Aim of the Work

The purpose of the current study is to evaluate the possible correlation between serum homocysteine levels and Pre-eclampsia in a group of pregnant Egyptian women.

Pre-eclampsia

Pre-eclampsia is pregnant – specific disorder that affects 3- 5% of pregnant women world wide and is one of the most frequently encountered medical complications of pregnancy **(Brett et al., 2010).**

Classically the condition present with new -onset hypertension and proteinuria after 20 weeks of gestation **(ACOG, 2002)**. In developing countries where access to health care is limited, Pre-eclampsia is leading cause of maternal mortality causing an estimate 760,000 maternal death world wide per year **(WHO, 2005).**

Risk Factors of Pre-eclampsia:

1- Age:

Very young maternal age and advanced maternal age independent risk factor of Pre-eclampsia **(Sibai et al., 2005 and Duckitt and Harrington, 2005).**

2- Parity:

Most Pre-eclampsia occurs in healthy nulliparous women, this incidence may be high as 7.5% **(Brett et al., 2010).**

Although Pre-eclampsia is disorder of women in their first pregnancy, multiparous pregnant women with new partner have