Role of Serum Total Antioxidants Level in Preterm Labor

Thesis

Submitted for Partial Fulfillment of Master Degree
in Obstetrics and Gynecology

BY

Abdallah Salah Abdelatif Mohamed

M.B.B.Ch (2005) Sohag University

Resident of Obstetrics and Gynecology El-Maragha Hospital- Sohag

Under supervision of

Prof.Dr. Hazem Fadel El-Shahawy

Professor of Obstetrics and Gynecology

Faculty of Medicine, Ain Shams University

Dr. Ahmed Mohamed Ibrahim

Assistant Professor of Obstetrics and Gynecology

Faculty of Medicine, Ain Shams University

Dr. Mohamed Saeed El-Din El-Safty

Lecturer in Obstetrics and Gynecology

Faculty of Medicine, Ain Shams University

Faculty of Medicine

Ain Shams University

2013

I wish to express my deepest thanks, gratitude and appreciation to **Prof.Dr. Hazem Fadel El-Shahawy**, Professor of Obstetrics and Gynecology *for his meticulous supervision, kind guidance, valuable instructions and generous help.*

I am deeply thankful to **Dr. Ahmed Mohamed Ibrahim**, Assistant Professor of Obstetrics and Gynecology *for his great help, outstanding support, active participation and guidance.*

Lastly I am deeply grateful to **Dr. Mohamed Saeed El-Din El-Safty**, Lecturer in Obstetrics and Gynecology who was behind this work in all its steps, offering much of his time, effort, valuable knowledge and discussing with me every point in this study.

Finally, I want to express special thanks to **Dr. Amr Fatouh**, Professor of Clinical Pathology who helped me in laboratory part of this work.

Abdallah Salah

List of Contents

List of Figures

List of Tables

List of Tables (Cont.)

List of Abbreviations

ACTH	*Adrenocortico trophic hormone*
ATP	*Adenosine-triphosphate*
BMI	*Body mass index*
BPD	*Bronchopulmonary dysplasia*
CAM	*Chorioamniotis*
CPAP	*Continuous positive airway pressure*
CP	*Cerebral palsy*
CRH	*Corticotrophin releasing hormone*
CRP	*C-reactive protein*
COX	*Cyclooxygenase*
DES	*Diethyl stilbesterol*
D&C	*Dilatation and curettage*
GSHPx	*Glutathione peroxidase*
GSHR	*Glutathione reductase*
HL	*Hearing loss*
HPA	*Hypothalamic pituitary axis*
IL	*Interleukin*
IUGR	*Intrauterine growth retardation*
IVF	*In vitro fertilization*
LEEP	*Loop electrosurgical excision procedure*
LPS	*Lipopolysaccharide*
MDA	*Melanodialdhyde*
MMPs	*Matrix metalloproteinases*
MR	*Mental retardation*
NADP	*Nicotinamide adenine dinucleotide phosphate*
NICU	*Neonatal intensive care unit*

List of Abbreviations (Cont.)

NO	*Nitric oxide*
OS	*Oxidative stress*
PDA	*Patent ductus arteriosis*
PROM	*Premature rupture of membrane*
PPROM	*Preterm Premature rupture of membrane*
PTB	*Preterm birth*
PTL	*Preterm labor*
RCOG	*Royal collage of obstetric and gynecology*
RDA	*Recommended dietary allowance*
RDS	*Respiratory distress syndrome*
ROS	*Reactive oxygen spices*
SGA	*Small for gestational age*
SOD	*Super oxide dismutase*
SPTL	*Spontaneous preterm labor*
VI	*Visual impairment*
WBCs	*White blood cells*
WHO	*World health organization*
XO	*Xanthine oxidase*

Role of Serum Total Antioxidants Level in Preterm Labor

Protocol Of Thesis
Submitted for partial fulfillment of Master degree
in Obstetrics and Gynecology

BY

Abdallah Salah Abdelatif Mohamed
M.B.B.Ch(2005)
Resident of Obstetrics and Gynecology El-Maragha Hospital- Sohag

Under supervision of

Dr. Hazem Fadel El-Shahawy
Professor of Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University

Dr. Ahmed Mohamed Ibrahim
Assistant Professor of Obstetrics and Gynecology
Faculty of Medicine,Ain Shams University

Dr. Mohamed Saeed El-Din El-Safty
Lecturer in Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
2011

INTRODUCTION

Preterm delivery (defined as delivery that occurring after 20 weeks and before 37 completed weeks of gestation.) occurs in around 7% of all pregnancies and is a major cause of infant mortality and morbidity, Although fewer than 10% of all infants born in the United States are preterm infants, their contribution to neonatal morbidity and mortality ranges from 50% to 70% ***(Hobel et al., 2007).***

The causes of preterm labor are multifactorial and vary according to gestational age. Important common pathways leading to preterm birth include stress, systemic or maternal genital tract infections, placental ischemia or vascular lesions, and uterine over distension. These pathways differ in their initiating factors and mediators, but ultimately, they share many common features that result in preterm uterine contractions and birth ***(Behrman and Butler, 2007).***

However, the etiology and pathogenesis of preterm labor and delivery remains poorly understood. Preterm birth attributed to preterm labor is related to inflammation and infection, with about a quarter of all preterm births associated with microbial invasion ***(Masamoto et al., 2008).***

Inflammation enhances reactive oxygen species (ROS) and systemic inflammation produces severe oxidative stress,

leading to tissue damage, resulting in preterm premature rupture of the membranes (PPROM), and preterm labor ***(Connors and Merrill, 2004)***.

Cells can defend themselves against ROS damage through antioxidants, which can prevent or counterbalance oxidation even at low concentrations ***(Wall, et al., 2002).***

Antioxidants may help prevent preterm birth associated with inflammation and preterm labor ***(Chadha et al., 2007*)**.

Other similar study proves that women with preterm labor have decreased level of total antioxidant status compared with women with uncomplicated pregnancies in similar gestational weeks ***(Cinkaya et al., 2010).***

AIM OF THE WORK

The aim of this study is to detect the association between serum antioxidant level and preterm labor.

Patients and Methods

Study design:

This is a prospective case-control study will be conducted at Ain Shams University Maternity Hospital**.** The sample size was calculated using the PS program. It was found that at least A sample of 35cases per group was found to be adequate putting in consideration a mean difference of 0.256 and S.D.=1.77-1.47 with error=0.05 and a power of study 80% using power and sample size calculation program (PS).

So the study will include a total of 70 pregnant women attending the outpatient obstetric clinic and inpatient of Obstetrics and Gynecology department or when they will be admitted to the delivary room of Ain Shams university hospital.

Patient will be divided in to two groups.

Group A (study group): 35 pregnant women diagnosed with established preterm labor (Pregnant 28-37 weeks Preterm labor pain at least 3 contraction every 20 minutes, cervical dilatation > 2cm and effacement> 50%) which will deliver within one week maximum after hospitalization**.**

Group B (control group): 35 pregnant women with uncomplicated pregnancies at similar gestational ages followed routinely in the antenatal care unit.

Inclusion criteria:

1. Preterm labor (pregnant between 28th and 37th week).
2. Singleton pregnancy.
3. Intact amniotic membranes.

Exclusion criteria:

1. Past history of preterm labor or premature delivery.
2. Urinary tract infections and any other infections.
3. Poly- or oligohydramnios.
4. Fetal distress, fetal or uterine anomaly.
5. Membranes rupture and placenta pathology.
6. Preeclampsia or intrauterine growth retardation.

Every case will be subjected to:-

1. Informed consent before the study.
2. Complete history.
3. Complete general and abdominal examination.
4. Infection markers (CRP, WBCs count, urine analysis).
5. Gestational age determination by the last menstrual date or Ultrasonography.
6. Local pelvic examination.

Methodology:

SPECIMEN REQUIREMENT:

Two cc peripheral venous blood sample will be drained in a test tube without anticoagulant and will be protected from light, centrifuged for 15 min at 2000/min and serum kept at -80°C.

METHOD:

Total antioxidant status measurements will be assayed by photometric assay using Cayman's Antioxidant Assay in a plate reader capable of measuring absorbance at 750 nm or 405 nm.

Statistical methods:

- Sample size justification:

A sample of 35cases per group was found to be adequate putting in consideration a mean difference of 0.256 and S.D.=1.77-1.47 with error=0.05 and a power of study 80% using power and sample size calculation program (PS).

- Statistical analysis:

Data will be collected, tabulated, coded and analyzed by computer software SPSS (Statistical program for social science) version 16.0. Numerical variables will be examined for normality then will be expressed as mean, standard deviation or