

سامية محمد مصطفى



شبكة المعلومات الجامعية

# بسم الله الرحمن الرحيم



سامية محمد مصطفى



شبكة المعلومات الجامعية



# شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم





سامية محمد مصطفى



شبكة المعلومات الجامعية

# جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



## يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



سامية محمد مصطفى



شبكة المعلومات الجامعية



# بعض الوثائق الأصلية تالفة





سامية محمد مصطفى



شبكة المعلومات الجامعية



# بالرسالة صفحات لم ترد بالأصل



**BLOOD LEAD LEVEL IN PRETERM  
AND FULL-TERM DELIVERING  
WOMEN AND THEIR NEONATES**

**Thesis**

**SUBMITTED FOR PARTIAL FULFILLMENT OF M.Sc. DEGREE  
IN CLINICAL BIOCHEMISTRY**

By

*Manar Abdel-Aal Obada*

M.B., B.Ch

*Supervised By*

**Prof. Dr. Ahmed Abbass Raouf**  
Professor and Chairman of Biochemistry Dept.,  
Faculty of Medicine & Liver Institute, Menoufiya University

**Dr. Ahmed Nabil Abdel-Hamid Eissa**  
Assistant Professor of Obstetrics & Gynecology,  
Faculty of Medicine, Menoufiya University

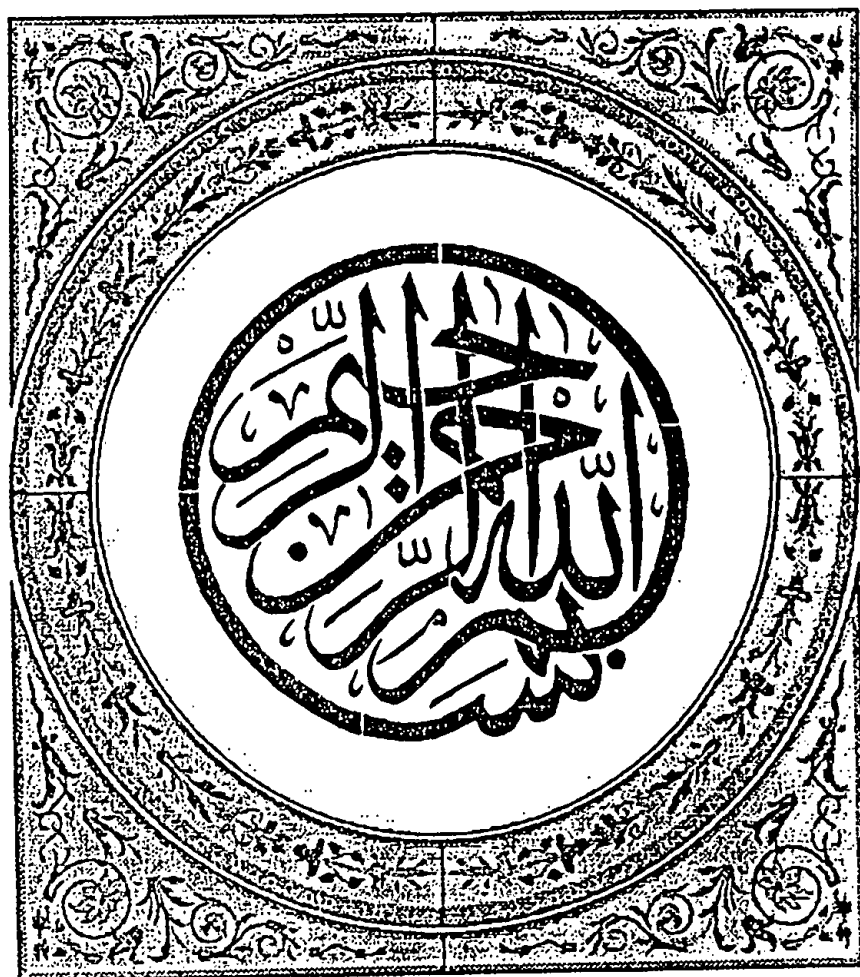
**Dr. Naglaa Mohamed Ghanayem**  
Lecturer of Biochemistry,  
Faculty of Medicine, Menoufiya University

**FACULTY OF MEDICINE  
MENOUEFIYA UNIVERSITY**

2000



B  
10471





*To My  
Beloved  
Family*



## ***CONTENTS***

Introduction	1
Aim of the work	4
Review of Literature	5
I. Chemistry of lead	5
II. Effect of lead on reproduction, pregnancy and pregnancy outcome	57
Subjects and methods	72
Results	84
Discussion	125
Summary and conclusion	137
References	141
Arabic summary	

PVC	Polyvinyl chloride
RBCs	Red blood cells
RLUS	Relative light units.
RNA	Ribonucleic acid
SGA	Small gestational age
TEL	Tetraethyl lead
TIBC	Total iron binding capacity
TML	Tetramethyl lead
TRH	Thyrotropin-releasing hormone
TSH	Thyroid stimulating hormone
U ALAD	urinary $\delta$ -aminolevulinic acid dehydratase
UCP	Urinary coproporphyrin
WBCs	White blood cells
WHO	World Health Organization
X-RF	X-ray film
ZPP	Zinc protoporphyrin

## ***LIST OF TABLES***

Table (1):	Characteristics of the studied mothers	96
Table (2):	Characteristics of the studied neonates.	96
Table (3):	Descriptive statistics of maternal biochemical parameters in pre-term group	97
Table (4):	Descriptive statistics of maternal biochemical parameters in full-term group	98
Table (5):	Descriptive statistics of biochemical parameters in cord blood of pre-term neonates	99
Table (6):	Descriptive statistics of cord blood biochemical parameters in full-term neonates	100
Table (7):	Descriptive statistics of hematological parameters in pre-term women	101
Table (8):	Descriptive statistics of hematological parameters in full-term women	102
Table (9):	Descriptive statistics of cord blood hematological parameters in pre-term neonates	103
Table (10):	Descriptive statistics of hematological parameters in full-term neonates	104
Table (11):	Comparison between full and pre-term women as regard the biochemical parameters	105
Table (12):	Comparison between full and pre-term neonates as regard the cord blood biochemical parameters	106



Table (13): Comparison between full and pre-term women as regard the hematological parameters	107
Table (14): Comparison between full and pre-term neonates as regard the hematological parameters	108
Table (15): Comparison between preterm mothers and their neonates as regard biochemical parameters	109
Table (16): Comparison between full-term mothers and their neonates as regard biochemical parameters	109
Table (17): Comparison between pre-term mothers and their neonates as regard the hematological parameters	110
Table (18): Comparison between full-term mothers and their neonates as regard the hematological parameters	111
Table (19): Correlation between maternal and cord blood lead (Pb) and different biochemical and hematological parameters in preterm group	112
Table (20): Correlation between maternal and cord blood lead (Pb) and different biochemical and hematological parameters in full-term group	113

## ***LIST OF FIGURES***

<i>Fig. (1):</i>	Maternal and neonatal cord blood lead level in pre-term and full term	114
<i>Fig. (2):</i>	Correlation between maternal blood lead and neonatal cord blood lead in full-term (A) and preterm group (B)	115
<i>Fig. (3):</i>	Correlation between maternal blood lead and RBCs in full-term (A) and preterm group (B)	116
<i>Fig. (4):</i>	Correlation between maternal blood lead and maternal blood hemoglobin in full-term (A) and preterm group (B)	117
<i>Fig. (5):</i>	Correlation between maternal blood lead and MCV in full-term (A) and preterm group (B)	118
<i>Fig. (6):</i>	Correlation between neonatal cord blood lead and RBCs in full term (A) and preterm women (B)	119
<i>Fig. (7):</i>	Correlation between neonatal cord blood lead and hemoglobin in full term (A) and preterm group (B)	120
<i>Fig. (8):</i>	Correlation between neonatal cord blood lead and MCV in full term (A) and preterm group (B)	121
<i>Fig. (9):</i>	maternal blood lead level in Kohl user women	122
<i>Fig. (10):</i>	Maternal blood lead level in women with smoking and non-smoking husbands	123
<i>Fig. (11):</i>	Cord blood lead level in neonates delivered to women with smoking and non-smoking husbands	124



# INTRODUCTION



## INTRODUCTION

Lead is the fifth most abundant metal in the world, after iron, copper, zinc, and aluminum. High blood lead levels can affect survival and development of the fetus and the infant. Sterility, abortion, stillbirth, premature delivery and adverse pregnancy outcomes such as low birth weight, failure to thrive and impaired mental development of infants were recognized at low lead exposure levels. Lead can readily cross the placenta during the entire pregnancy and fetal levels ultimately equilibrate with maternal levels (Rom, 1976 and Mirghani, 1997).

Mayer et al. (1986) consistently identified a link between maternal blood level of 100 - 150  $\mu\text{g/L}$  and disturbance in early infant and neurological behavior performance. They concluded that the previously accepted safe maternal blood level of 250  $\mu\text{g/L}$  is too high, and that adverse reproductive and neurobehavior effects may occur at blood lead levels commonly found in the population of many nations today.

McMichael et al. (1986) showed that preterm deliveries were significantly related to maternal blood lead levels at