ACKNOWLEDGEMENTS

I would like to express my deepest appreciation and gratitude to Assis. Prof. Dr. **MOURAD EL SAID** , Assis.Professor of Obstetrics and Gynaecology, Faculty of Medicine, Ain Shams University , for his kind supervision, valuable advises and continuous guidance and for his sustained patients in reading and revising the manuscripts.

I am greatly indebted to Dr. **ROWAA A. MOSTAFA** Lecturer of Obstetrics and Gynaecology, Faculty of Medicine , Ain Shams University , for his greatest and unforgettable help and for his valuable comments, suggestions and close supervision.

I also wish to express my sincerest and cardial thanks to Dr. **MONA WAHBA** Lecturer of Clinical Pathology ,Faculty of Medicine, Ain Shams Univesity, for her valuable and great supervision and help during preparation of this thesis.

Dina Farouk Mohammed
1996

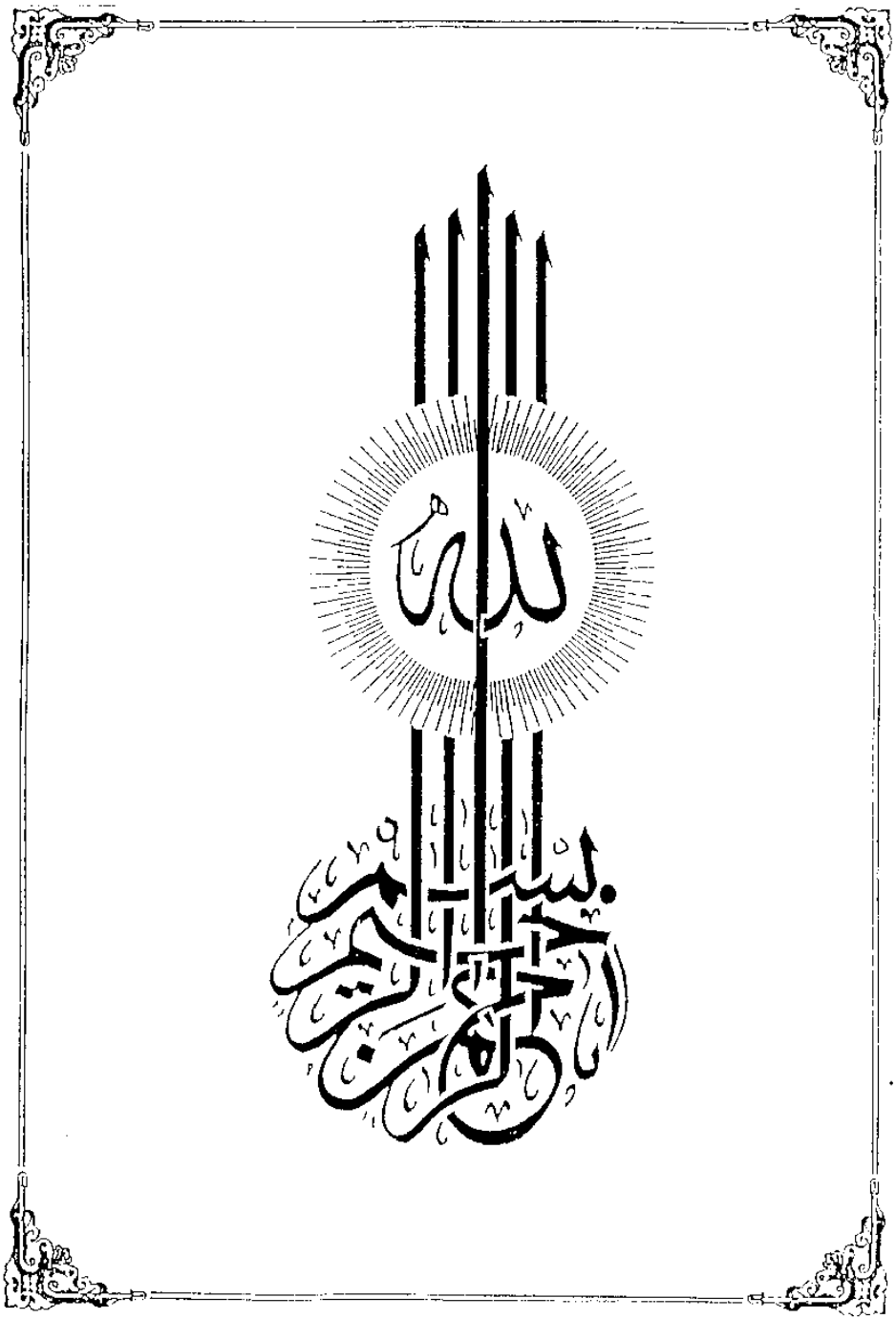
ACKNOWLEDGEMENTS

I would like to express my deepest appreciation and gratitude to Assis. Prof. Dr. **MOURAD EL SAID** , Assis.Professor of Obstetrics and Gynaecology, Faculty of Medicine, Ain Shams University , for his kind supervision, valuable advises and continuous guidance and for his sustained patience in reading and revising the manuscripts.

I am greatly indebted to Dr. **ROWAA A. MOSTAFA** Lecturer of Obstetrics and Gynaecology, Faculty of Medicine , Ain Shams , for his greatest and unforgettable help and for his valuable comments, suggestions and close supervision.

I also wish to expressmy sincerest and cardial thanks to Dr. **MONA WAHBA** Lecturer of Clinical Pathology ,Faculty of Medicine, Ain Shams Univesity, for her valuable and great supervision and help during preparation of this thesis.

Dina Farouk Mohammed
1996



TO MY PARENTS,

The valuable source of my life

CONTENTS

	Pages
ABBSTRACT	1
INTRODUCTION AND AIM OF THE WORK	2
REVIEW OF LITERATURE	6
-Preterm labour	6
.Definition of preterm labour	
. Incidence of preterm labour	
. Aetiology and risk factors	
. Iron Homeostasis	22
. Ferrokinetics	26
.Ferritin	32
.Iron deficiency anaemia	41
. Ferritin level in iron deficiency anaemia and preterml abour	47
SUBJECTS AND METHODS	50
RESULTS	53
DISCUSSION	74
SUMMARY	79
CONCLUSION	81
REFERENCES	-
ARABIC SUMMARY	

LIST OF TABLES

Pages

Table I: Mean value of serum ferritin during pregnancy..... 38

Table 2: Period of gestation in patients with low serum ferritin..... 47

Table 3 : The obstetrical status of cases and controls..... 56

Table 4 : Haemoglobinlevel among cases and controls..... 57

Table 5 : Serum ferritin level in cases And controls..... 58

Table 6 : Correlation between serum ferritin and gestational age in the patients group..... 59

Table 7: Correlation between serum ferritin and gestationsal age in the controls..... 59

Table 8 : Correlation between serum ferritin and number of abortion in cases..... 60

Table 9 : Correlation between serum ferritin and number of abortion in the controls..... 60

Table l0 : Correlation between serum feritin and haemoglobin level in cases..... 6l

Table ll : Correlation between serum ferritin and haemoglobin level in controls..... 6l

LIST OF FIGURES

	Pages
Fig. (1) Daily Iron Cycle.....	31
Fig. (2) Comparison between patients and controls regarding number of abortions...	63
Fig. (3) Comparison between patients and controls regarding the parity.....	64
Fig. (4) Comparison between patients and controls regarding the gravidity.....	65
Fig. (5) Comparison betweenpatients and controls regarding the haemoglobin %...	66
Fig. 6) Comparison between patients and controls regarding the serum ferritin level.....	67
Fig. (7) Correlation between serum Ferritin and gestational age in the patients group.	68
Fig. (8) Correlation between serum ferritin and gestational age in the control group.	69
Fig. (9) : Correlation between serum ferritin and number of abortion in the patients group.....	70
Fig. (10): Corellation between serum ferritin and number of abortion in the control group.....	71
Fig. (11) Correlation between serum ferritin and haemoglobin in the patients group....	72
Fig.(12) Correlation between serum ferritin and haemoglobin int he controls.....	73

ABSTRACT

OBJECTIVE:

To measure serum ferritin levels in pregnant women presenting with preterm labour and compare this to those level in normal pregnancy. Also to elucidate the relationship between changes of serum ferritin level and preterm labour.

METHOD:

50 pregnant women comprised the control group in a prospective study . Blood samples were obtained from both groups. Haemoglobin was measured, then serum ferritin was measured after separation of sera. Data was analysed using student's t-test, the X^2-test

RESULTS:

Subjects with preterm labour were found to have significant lower mean serum ferritin level than the controls. ($P < 0.05$).

CONCLUSIONS:

Iron deficiency anaemia defined as low Hb level and low serum ferritin shows high incidence of development of preterm labour.

KEY WORDS:-

Preterm labour- Serum ferritin levels- Iron deficiency anaemia .

TITLE:

SERUM FERRITIN IN PRETERM LABOUR

By

Dina Farouk Mohammed (M.B., B.Ch.)

El-Monira Hospital

INTRODUCTION
AND
AIM OF THE WORK

INTRODUCTION

Iron-deficiency anaemia is the most common form of anaemia, it probably amounts to 70-90% in women of childbearing age, and mainly results from menstruation and pregnancy (Goltner, 1981 and Kaltwasser, 1981).

Heinrich et al., (1968) estimated the incidence of iron deficiency in women who are 6 months pregnant to be 92%, in those who are 7-9 months pregnant 100%. These statistics are based on studies carried out using iron resorption test.

Goltner (1978 and 1981) was able to substantiate these findings by means of examination of bone marrow. The increased iron requirement in pregnant women resulting from placenta, the umbilical cord and the fetus is normally compensated for by mobilizing the reserves in their iron stores. If the iron stores are already depleted prior to pregnancy, the increased demand will not be compensated for by an increased absorption, the pregnant women thus going from mild to severe state of iron deficiency.

As a result of severe states of iron deficiency, pregnant women are more prone to infections (Goltner, 1981), and exhibit a higher incidence of pyelonephritis, placental insufficiency (Fed, 1983 and Goltner, 1981) and puerperal fever (Goltner, 1981 and Goodline,1982).

Ulmer et al., (1985) drew attention to the relation between low serum ferritin values and the incidence of preterm labour, which is considered one of the potential complications of iron-deficiency anaemia (Goodlin, 1982).

Anaemia is normally ruled out or diagnosed in prenatal examinations by determining the haemoglobin (Hb) level. In individual cases, the estimation of mean corpuscular haemoglobin (MCH) value or of serum iron may provide additional information.

Taken on its own, the estimation of Hb is often insufficient as it does not provide reliable information of iron stores or lack of iron (Kunkel, 1954 and Segall, 1979).

Additional information can certainly be obtained by assessing the MCH value, as the presence of anaemia is very likely if low Hb level is accompanied by decreased MCH value (Frick, 1982).

The direct estimation of serum iron only provides an inadequate index of the iron stores in the body, as it is dependant on the absorption and release of iron in and from the stores (Frick, 1982 and Kaltwasser, 1981).

In the literature, serum ferritin is regarded as a reliable parameter for the quantitative estimation of the iron stores (Jacobs, 1972 and Kaltwasser, 1981) since iron reserves are mainly stored in the liver and in the reticuloendothelial system as ferritin in a spectific protein-bound form (Kaltwasser, 1981 and Frick, 1982 . Thus the estimation of serum ferritin can be regarded as a reliable parameter for the diagnosis of iron deficiency.

Maternal iron-deficiency anemia diagnosed at entry to prenatal care was associated with twofold a greater increase in the risk of preterm delivery (Scholl , Hediger 1994).

The determination of serum ferritin is of particular relevance as a significant correlation was ascertained between low serum ferritin levels and the incidence of preterm labour (Ulmer, Goepel, 1989).

AIM OF THE WORK

The aim of the current study is to measure serum ferritin levels in pregnant women presenting with preterm labour and compare these to those levels in normal pregnancy. This work is aiming to elucidate the relationship between changes of serum ferritin level and the occurrence of preterm labour

REVIEW OF LITERTIRE

PRETERM LABOUR

Definition of Preterm labour:

By definition, any delivery occurring prior to 37 weeks gestation is classified as preterm labour. Due to the difficulty in estimating gestational age in some cases a new born weight of 2500 gs, also has been used as a cut-off . It should be pointed out, however, that preterm and "Low birth weight" are not equivalent concepts.

According to World Health Organization conventions (1977) , the terminology of preterm labour is : " delivery before 37 weeks gestation with regular uterine contractions and gradual effacement of the cervix and/or 5 cm or more of cervical dilatation or with cervical changes observable during a 2hour observation".

Incidence of Preterm Labour

In a retrospective study of the incidence of preterm delivery at Aberdeen, it was found to be 5% (Chang, 1981) . This incidence corresponds with that reported from perinatal England centers of 5.1% (Rush et al., 1976). At perinatal referral centers in New Zealand the incidence was 10.7% and 11.8% for 1973, 1974 respectively (Bantham, 1981).

In underdeveloped countries, the incidence of preterm deliveries rises as the nutritional standard falls, and in some countries it is as high as 25% (Donnelly et al., 1964).

Aetiology And Risk of Preterm Labour:

There are many risk factors which may rise the incidence of preterm labour as:-