ASSOCIATION OF SOME HAEMATOLOGICAL PARAMETERS WITH PRETERM LABOUR

THESIS
Submitted for partial fulfilment of the
Master Degree (M.Sc.)
In
Obstetrics and Gynaecology

By
Adel Ahmed Hassanein Aly
M.B.,B.Ch.

Supervisors
Prof. Dr. Aly Elyan Khalaf Alla
Prof. of Obst. & Gyn.
Ain Shams University

Dr. Sherif El Getany
Assist. Prof. of Obst. & Gyn.
Ain Shams University

Dr. Nashwa Ahmed El Badawi
Lecturer of Clinical Pathology
Ain Shams University

Faculty of Medicine
Ain Shams University
1992

ACKNOWLEDGMENTS

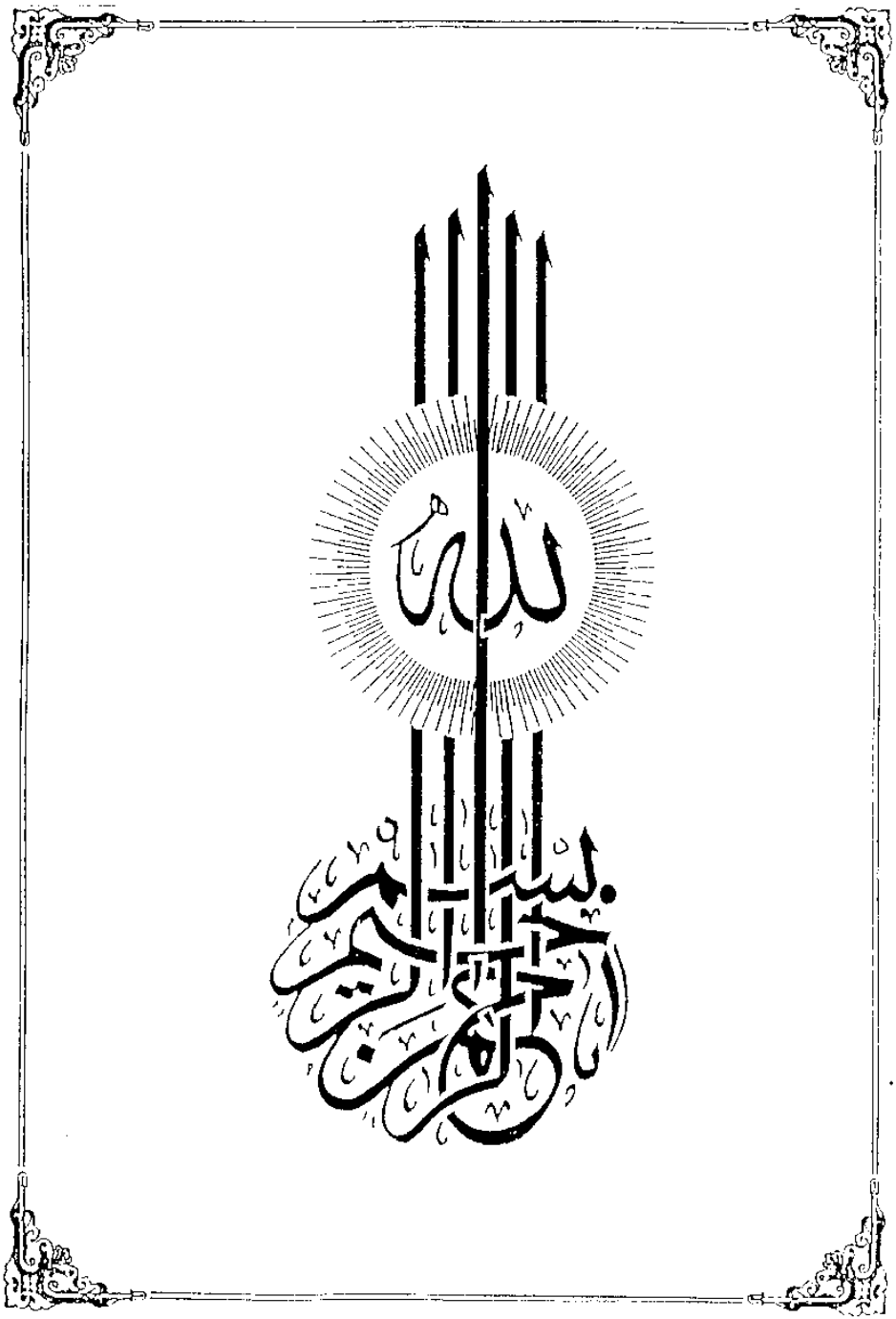
I wish to express my gratitude to **Prof. Dr. Aly Elyan Khalaf Alla**, Professor of Obstetrics and Gynaecology, Ain Shams University, for his help and encouragement all through this work.

I feel deeply indebted to **Dr. Sherif El Getany**, Assistant Professor of Obstetrics and Gynaecology, Ain Shams University, for his keen and cordial support and valuable remarks throughout this work.

My thanks are also due to **Dr. Nashwa Ahmed El Badawi**, Lecturer of Clinical Pathology, Ain Shams University, for her considerate help and assistance through this work.

Tribute must be paid to **Dr. Ehab Abd El Fatah**, Lecturer of Obstetrics and Gynaecology, Ain Shams University, whose role in the presentation of results cannot be overestimated.

I would also like to thank the laboratory staff at Ain Shams University Maternity Hospital for their praiseworthy efforts in processing the laboratory samples and obtaining the results necessary for the accomplishment of the study.



Contents

Introduction

Introduction

Pre-term (premature) delivery occurs if the infant is born less than 37 weeks (259 days) from the first day of last normal menstrual period.

It is preterm birth-not low birth weight- that is the primary cause of perinatal mortality, accounting for 85% of neonatal deaths not caused by lethal congenital malformation (Rush et al., 1976). Significant risk factors of a preterm delivery included low socioeconomic status; low pregravid weight; inadequate weight gain during the pregnancy; a previous preterm delivery; a history of infertility problems; an induced abortion terminating the previous pregnancy; vaginal spotting or light bleeding during early pregnancy; antepartum haemorrhage and abnormal placental implantation; lack of leisure-time physical activities during the pregnancy; alcohol consumption prior to the third trimester of pregnancy; negative attitudinal expression towards the pregnancy; and smoking (Meyer, 1977 and Berkowitz, 1981). However, another potential risk factor is maternal anemia defined in pregnancy as a haemoglobin less than II gm/dl,

this is not generally considered to be an important predictor of premature labour (Taylor, 1981).

Many recent epidemiologic studies of prematurity have not considered this factor (Berkowitz, 1981, Chamberlain, 1984) and many formalised risk assessment. Tools designed to predict prematurity do not include anemia as a risk factor (Kaminski et al., 1973 and Creasy et al., 1981). Anemia is still a frequently encountered complication of pregnancy and even in developed countries may be responsible for maternal, foetal morbidity and mortality (Mc Fee, 1973a).

Anemia is associated with an increased incidence of complication of pregnancy, there is an increase in premature births and foetal distress, perinatal foetal mortality is increased, toxemia of pregnancy is more frequent and in severe anemias, maternal deaths become significant (Mc Fee, 1973b).

An examination of the association of maternal hematocrite with the occurrence of premature birth revealed a continuous relationship between these two factors with an increasing rate of prematurity occuring with decreasing maternal hematocrite (Lieberman, 1987).

AIM OF THE WORK

Aim of the work

The aim of this work is to investigate the association and possible predictive value of some maternal haematological parameters with the occurrence of preterm labour.

Review of Literature

Definition of preterm labour:

Preterm labour is defined as the spontaneous onset of labour 21 days or more prior to term, irrespective of birth weight. The term 'premature' is best avoided as it has been used in the past to include definitions by weight and/or gestation period, usually comprising all low birth weight babies without separately identifying those suffering from intra-uterine growth retardation (small for gestational age). Precise classification is ultimately dependent on paediatric assessment particularly, if the gestation period cannot be calculated accurately from the menstrual data and supporting evidence, such as when ultrasonographic dating, is not available.

The terminology of 'low birth weight' is recommended for births weighing less than 2500 gm, instead of the previous definition which was equal to or less than 2500 gm (WHO, 1977).

Other recommended definitions by WHO, 1977, are:

Small for gestational age (SGA) infant:

Newborn with weight below the 10^{th} percentile for gestational age according to lubchenco tables.

Appropriate for gestational age (AGA) infants:

Newborn with weight between the 10th and the 90th percentile for gestational age according to Lubchenco tables.

Very low birth weight infant:

Newborn with birth weight under 1500 gm.

Extreme prematurity:

Infants with birth weight under 1000 gm.

Preterm labour:

Patients before 37 weeks gestation with regular uterine contractions and intact foetal membranes with 5 cm or more of cervical dilatation or with cervical changes observable during a 2-hour observation.

Preterm rupture of membranes:

Foetal membranes ruptured at least 1 hour before the onset of labour in patients with less than 37 completed weeks of gestation.

Incidence of preterm labour

In a retrospective study of the incidence of preterm delivery at Aberdeen, it was found to be 5% (Chng, 1981). This incidence agrees with that the reported from a major perinatal centre in England, that there, incidence was 5.1% (Rush et al., 1976). In United States medical Centre (New York Hospital), it is reported to be 7.6% (Fuchs, 1976).

At a perinatal referral centre in New Zealand the incidence was 10.7% and 11.8% for 1973 and 1974 respectively (Bonham, 1978).

The incidence of spontaneous preterm labour is around 6% and, in addition, elective preterm delivery by induction of labour or caesarean section occurs in another 3-4% of patients (Anderson et al., 1977).

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 Factors of preterm labour

I. Factors associated with preterm labour:

1. Socioeconomic status:

A strong relation exists between low birth weight babies and low socioeconomic status irrespective of whether the later is defined on the basis of educational level, occupation, or income. The rise in the incidence of preterm delivery associated with declining socioeconomic status was described by Fedrick and Andrson, 1976.

The rate of preterm delivery among indigent patients is often as high as 15-20% in contrast to about 7% in the general population of the United States. The specific factors in the socioeconomically deprived patients may include:

a. Poor nutrition:

Pregnancy clearly has both immediate and longterm implications for the health of the infant whose optimum growth and development are related to the nutritional state of the mother, not only during pregnancy but also for many years before (Fush et al., 1976).

Parry-Jones and Priya (1976) showed a significant decrease in the elasticity of those membranes which ruptured prematurely and it is due to the alteration in the strength of the membranes that may be the cause of their premature rupture, this could be associated with the mother's nutritional background and therefore with socioeconomic class.

b. Poor hygienic habits influencing the bacterial or viral flora of the reproductive tract.

c. Coital freguency: sexual behaviour late in pregnancy may initiate labour as studied by many investigators (Wagner et al., 1976) and (Perkins, 1979).

Rayburn and Wilson (1980) found significant association between coital activity and premature labour only when apparent reason for premature labour was evident. They concluded that normal coital activity does not result in premature delivery and should not be discouraged during pregnancy in the absence of complications.