TRACE ELEMENTS IN PRE-TERM, TERM AND POST-DATE PREGNANCIES

THESIS

SUBMITTED BY

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In Partial Fulfilment of the Requirements
For the M.Ch. Degree
(OBSTETRICS AND GYNAECOLOGY)

UNDER SUPERVISION
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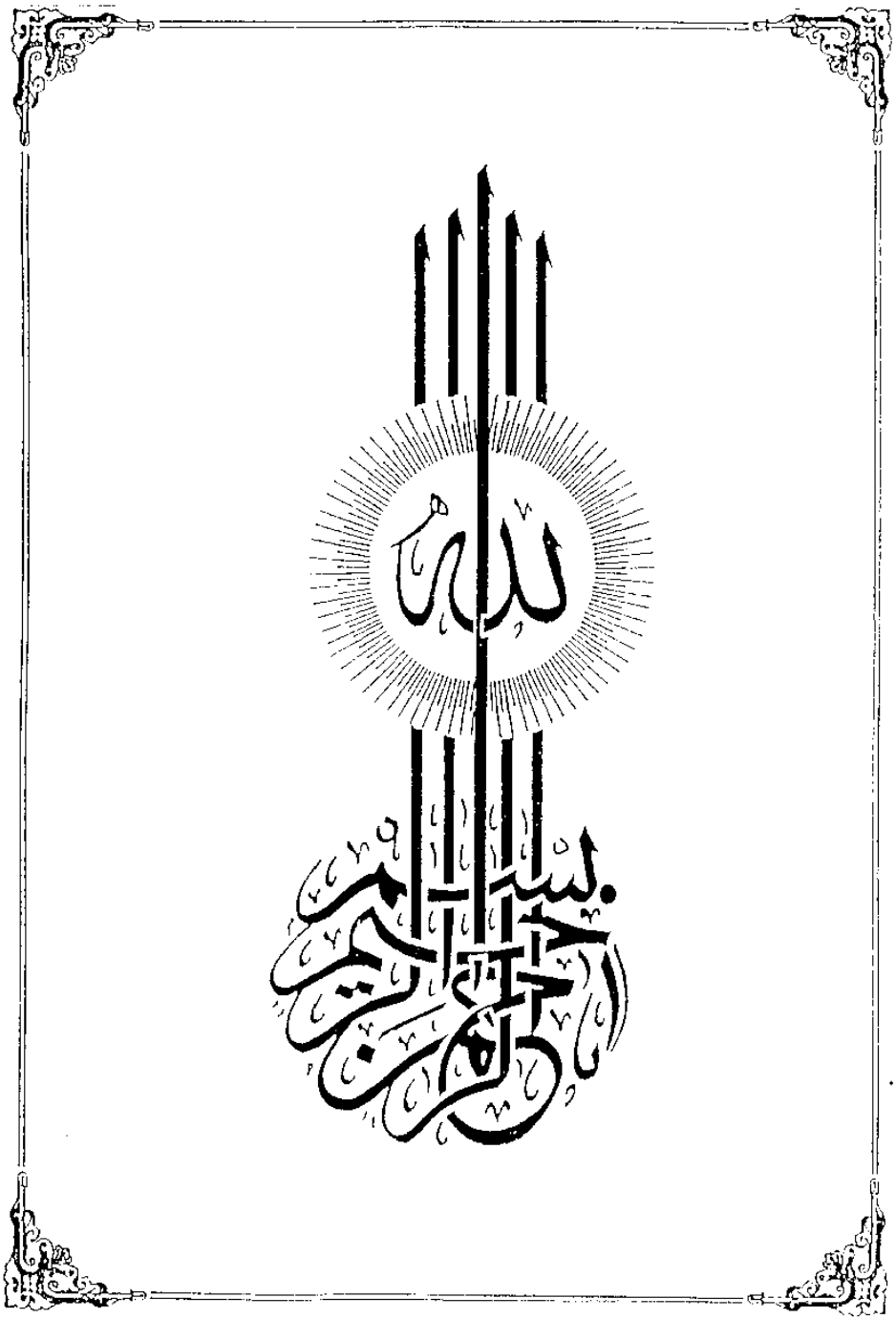
CAIRO, 1986

بسم الله الرحمن الرحيم



ACKNOWLEDGEMENT

I wish to express my gratitude and many thanks to Doctor Ali Elyan Khalaf Allah, Assistant Professor of Obstetrics and Gynaecology, Ain Shams University for his advice, encouragement and unlimited help, without whose supervision this work would not have been accomplished.

I present my gratitude and respect to Doctor Khaled Elmammoon Alhodaiby, Lecturer of Obstetrics and Gynaecology for his expert guidance.

To Dr. Mahmoud El-Kady, Professor of the Soil Department in the Desert Research Institute, I am deeply grateful for his supervision, encouragement and for making available the facilities for the analytical procedures needed in this research.

C O N T E N T S

INTRODUCTION

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AIM OF WORK

INTRODUCTION

The role of trace elements in health and disease is still poorly understood.

Serum levels of trace metals show typical changes towards the end of normal pregnancy. The decrease in calcium, iron, zinc and increase in copper are well-documented (Kiilholma, et al., 1984a).

To what extent these changes are physiological and to what extent pathological, is largely unknown. Reports suggesting that deficiencies of certain trace elements may be involved in complications of pregnancy have recently been published (Bogden, et al., 1978).

However, there are only limited data about these levels when pregnancy continues beyond term Therefore, (Kiilholma, et al., 1984b) have studied trace metal changes in post date pregnancy which stimulate us to do this work.

Postmaturity is a subject of great significance both medically and socially.

From the medical point of view: post maturity has a hazardus effect on the mother, on the fetus and on the medical centre.

The importance of preterm delivery as a major and public health problem is easily demonstrated by virtue of its contribution to total perinatal mortality (contributing between 50% and 70% of all perinatal deaths in most data sets).

The aetiology of preterm labour is often not known. The ideal approach of the problem of preterm delivery, prevention, is limited by the difficulty in identifying patients who will subsequently have a preterm delivery.

AIM OF THE WORK

This work is meant to study the maternal and cord calcium, copper, Iron and zinc in connection with postterm, term and preterm deliveries.

This is in a trial to indicate that changes in the concentrations of some trace elements may be of aetiologic significance in postterm and preterm pregnancies.

REVIEW OF LITERATURE

POST MATURITY

Normal full term pregnancy ends on an average of 280 days after the first day of the last menstrual period. The conception delivery period is the interval elapsing between ovulation and delivery and averages 266 days. (Knaus, 1934).

The majority of authors (Beischer et al., 1969; Helmuth Vorrher, 1975; Gobelsmann, 1979; and Yeh and Read, 1982) regard pregnancy as prolonged when it continues 294 days or more beyond the first day of the last menstrual period or 14 days past the estimated date of confinement. The estimated date of confinement "EDC" has been calculated from LMP by Naegele's rule which add one week and deduct 3 months.

The above rule is correct when the periods are regular of 28 days.

Kloosterman, (1956) found that the chance of delivery on the expected date of confinement is 5 percent while within ± 3 days of due date is 29 percent and within ± 2 weeks of the due date is 80 percent.

It has been found that many post term pregnancies are actually term pregnancies due to inaccurate

menstrual history (Cope 1959; Saito et al. 1972; and Freeman et al. 1981), or 4 to 6 weeks of amenorrhoea or delayed ovulation prior to conception (Cope, 1959), he reported that 10 to 15 percent of women of fertile age experience temporarily amenorrhoea or anovulatory cycles.

Schneider et al., (1978), reported that the term "post date" and "post mature" are not synonymous, only 21 percent of post date are dysmature. The term post maturity should only used when the syndrome of dysmaturity is seen in post date babies.

Knox et al., (1979), consider post date pregnancy is the pregnancy which lasts more than 42 weeks (294 days) calculated from the first day of the last menstrual period, this date of LMP is considered reliable if the patient:

1. Was certain of that date,
2. had a history of regular menstrual periods,
3. and had not taken oral contraceptives for at least 3 months prior to her last menstruation.

Homburg et al. 1979, consider post maturity, as that the pregnancy which goes beyond 273 days calculated

from the date of ovulation (41 weeks of amenorrhoea) and they applied this definition only to women in whome the date of ovulation was certain from the basal body temperature chart or had a +ve pregnancy test six weeks of their last menstrual period.

Post term pregnancy occurs in 10-12 percent of gravidas. A previous report estimated that approximately 10% of all deliveries would become post-term (Vorherr, 1975). Hauth et al., (1980) reported an incidence of 6.8%.Gibb, et al.,(1982) reported an incidence of 4% of "certain postmaturity". The incidence of post maturity was higher in male fetuses of both primigravide (male fetuses 7 percent and female fetuses 5 percent) and multigravidas (male fetuses 8 percent and female fetuses 5 percent). Considering all gravidas, postmaturity was found in 8.5 percent of male and 4 percent of female fetuses (Strand, 1956); Lindell, (1956) did not find the same difference between male and female fetuses.

Several theories are put in discussing the aetiology of postmaturity, some of these theories consider the maternal factors e.g. low oestrogen levels with relative dominence of inhibitors progesterone and thus myometrium remains quiescent beyond term, such a mechanism of local progesterone dominance may also be operative in cases of missed abortion (Vorherr, 1972). More recently endogenous prostaglandins have been considered as an important factor in regulation of duration of gestation and aberration

in their metabolism was hold responsible for fetal post maturity (Lewis, 1973). Other theories consider the fetus to play an important role in the start of labour and the main fetal organs concerned are hyothalamus, pituitary gland and adrenal cortex. So in fetal anomalies of which abscence of the hypothalamus is a part, a strong tendency towards prolonged pregnancy is present.

Hypothalamus is usually absent in anencephaly and the degree of hypoplasia of pituitary correlates with the extent to which pregnancy is prolonged. No doubt as a result of pituitary hypoplasia and diminshed secretion of ACTH, the adrenal cortex is hypoplastic. (Liggins, 1973).

In primary adrenal hypoplasia, an anomaly in which the hypothalamus and pituitary are normally developed, there is the same tendency to prolonged gestation as in anencephaly. Either corticosteroids or androgens could be the missing products of hypoplastic fetal adrenals, cortisol is the more important adrenal hormone mediating the fetal influence on labor; but large doses of various potent corticosteroids injected into pregnant women, into the amniotic sac, or

into the fetus itself fail to induce premature labor. (Liggins, 1973; Katz and associates, 1979).

Mati and Colleagues, (1973), however, reported the induction of labour in women beyond term after the intraomniotic injections of a large dose of betamethasone.

Another theory focus the aetiology on failure of placentofetal immune — survillance as exercised by trophoblastic cells (Bursteinet al.,1973). Trophoblastic inadequacy of recognition of abnormal trophoblastic behaviour (misspecification of proteins) in connection with placental aging and degeneration may not only result in insufficient placental function but also in development of immune tolerance with increased placental fibrinoid deposition, which may beacause for prolongation of gestation by acting as an immunologic barrier which seperates placenta and fetus from maternal immunologic interaction and in contrast to normal conditions, labor will not set in.

Post-maturity results in pathological changes in placenta, fetus and amniotic fluid.

The placenta may be normal in size or large thick, pale red or may be small degenerative with atrophic cotyledons (Vanrell-Cruells, 1963), he also