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ANTHROPOMETRY IN EGYPTIAN NEWBORNS

THESIS SUBMITTED IN PARTIAL FULLFILMENT
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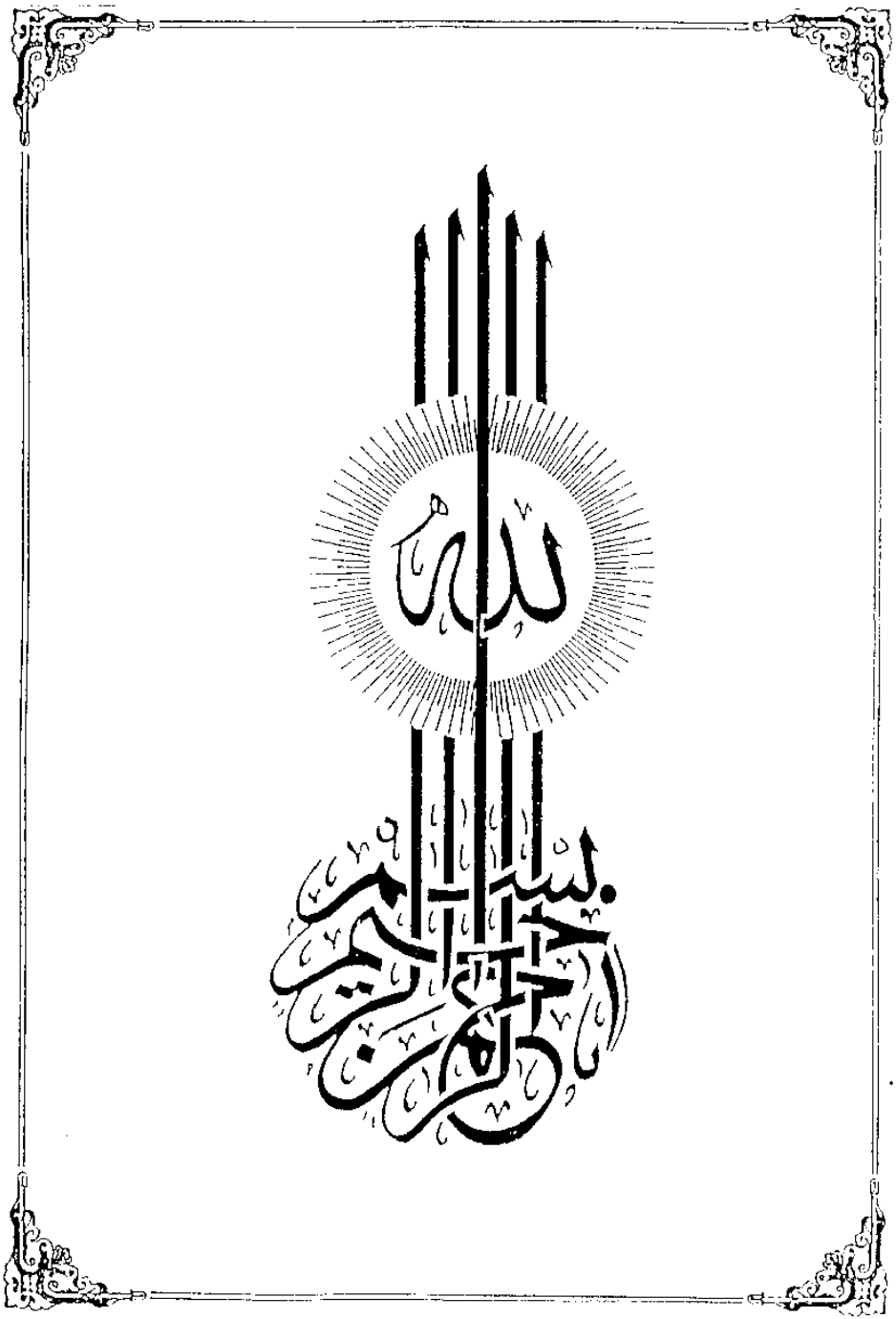

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Introduction

INTRODUCTION

Quelete (a French mathematician) was the first known person to use the term "anthropometry". (Harold, 1979)

The science of anthropometry means the science of measuring the different parameters of growth of the human being such as; weight, height, skull, chest, abdomen, upper limb, lower limb measurement as well as measurements of skin fold thickness. The measurement of man dates back to ancient civilization in Egypt and in India. A study was undertaken to find one part or component of the body that would predict or become a common measurement of the body parts. In Egypt, for example the length of the middle finger was considered a common measure of all body proportions (Harold, 1979). At the beginning of the present century, there was much interest in human fetal anthropometry. A relationship was established, for example between crown-rump length and gestational age (Roberts, 1976). It is necessary to quantitate normal fetal growth in utero and to provide its standards in order to assess fetal growth retardation and excessive fetal growth.

Diagnosis of abnormalities in body proportions such as achondroplasia, hydrocephalus and microcephely could be made at birth with greater accuracy if precise data were available on the range of variations in body proportions of the normal newborn.

Upper limb anthropometry allows an accurate assessment of body proportions in the newborn with impaired growth. It is important particularly in the evaluation of disproportionate short stature of the neonatal skeletal dysplasias and their short limb types.

An accurate diagnosis of reduced fetal growth is important because those who are significantly retarded are at increased risk of neonatal problems and developmental retardation.

Some of the congenital malformations associated with intrauterine growth retardation are Down's syndrome, Turner's syndrome, Trisomy 18 and Silver's syndrome.

There are several factors affecting fetal growth as race, age, social class, height, nutrition, parity, weight of the mothers and sex of the foetus. There are some diseases as diabetes mellitus, hypertension, and anaemia that may also affect rate of fetal growth.

Aim of the thesis

AIM OF THE THESIS

This thesis was an attempt to put body measurements for the Egyptian newborns.

Review of Literature

REVIEW OF LITERATURE

Fetal growth:

Monitoring fetal growth and detecting growth abnormalities is a major objective of modern prenatal care. At present this can best be done through the use of ultrasound, which permits the measurement of a wide variety of anatomic parameters that reflect the growth process. (Russell et al., 1986)

McFadyen et al., 1984 said that inspection of the body is not sufficient, gestational age and other factors associated with birth weight such as maternal size, must be included in the assessment of fetal growth and development at birth.

First half of gestation:

Menstrual age has been used, traditionally in studies on fetal growth because the mother is more likely to remember the dates of the last menstrual period than any of other events associated with conception. The menstrual age of the fetus is calculated from the first day of the mother's last menstrual period. Using this criterion, the average

length of pregnancy is generally considered to be ten lunar months 40 weeks of 283 days. (Karm and Penrose, 1951)

The true age of the fetus begins at the moment of the ovum and sperm fusion in the tube forming the first cell. True age or fertilization age, is about two weeks less than menstrual age. (Karm and Penrose, 1951)

Robinson et al., 1973 by use of ultrasound found that gestational sac is reliably visualized from six weeks' gestation and the embryo can be visualized from seven weeks' gestation.

Gestational sac volume is calculated from the formula, 0.5233 X d1 X d2 X d3 where d1, d2, d3 are the transverse, anteroposterior and longitudinal diameters of the sac. (Robinson, 1975)

Jakobovits et al., 1976 said that fetuses during the first half of pregnancy have a menstrual age of 20 weeks or less, weight 300 grams or less and have a crown rump length of no more than 120 mm. The sequence of intrauterine growth as related to first 20 weeks of menstrual age has been established and confirmed by various investigators using normal fetuses obtained exclusively as a result of legalized abortions.

Leane et al., 1977 found that in the fourth week of estimated gestational age (menstrual age minus 14 days), the length of the embryo is approximately 3.5mm and its weight is approximately 5mg by the end of the week. In the fifth week the embryo attains a crown rump length [CRL] of 4 to 8mm and weights between 5 and 50mg. In the sixth week the CRL of the embryo is approximately 8 to 14mm and its approximate weight is between 50 and 400mg.

During the seventh week, embryo attains a CRL of approximately 14 to 20mm and weight between 400 and 1,000mg. In the eighth week (the last week of embryonic period) the embryo reaches a CRL of 21 to 30mm and weights between 1,000 and 3,000mg.

Second half of gestation:

Grasser et al., 1981 said that the ever increasing length of embryos and fetuses is measured in two principle ways. Commonest during the first half of pregnancy is crown-rump length or sitting height that is measured from vertex to breech. During second half of pregnancy crown-heel length or standing height is most generally used and the direct relationship between menstrual age of the fetus and certain body

measurements continues throughout the second half of gestation.

Campbell et al., 1976 emphasized that in the first trimester measurement of crown-rump length is carried out, but after 12 weeks' gestation, flexion of fetal trunk makes this measurement unreliable, and measurement of the biparietal diameter is carried out.

Lubchenco et al., 1966 defined that head circumference as the largest occipitofrontal plane. This measurement reflects brain as well as skull growth and increases linearly with age until near term.

Willocks et al., 1967 found that the increase in biparietal diameter is almost linear until about 30 weeks, becoming less rapid. Before 30 weeks, ultrasonic cephalometry is the most satisfactory method of assessing the duration of pregnancy. If the biparietal diameter is 8.5cm or more, the fetus is unlikely to weight less than 1,800 grams (4 Ibs) and if the diameter is 9cm or more, the fetal weight will be 2250 grams (5 Ibs) or more.

Charles et al., 1964 found that the main daily growth (MDG) of the fetus rises rapidly after 30 weeks menstrual age, reaches a peak at approximately 37 weeks and drops off rapidly thereafter. By week 34 the MDG