# MATERNAL HEIGHT AND SHOE SIZE AS PREDICTORS OF PELVIC DISPROPORTION

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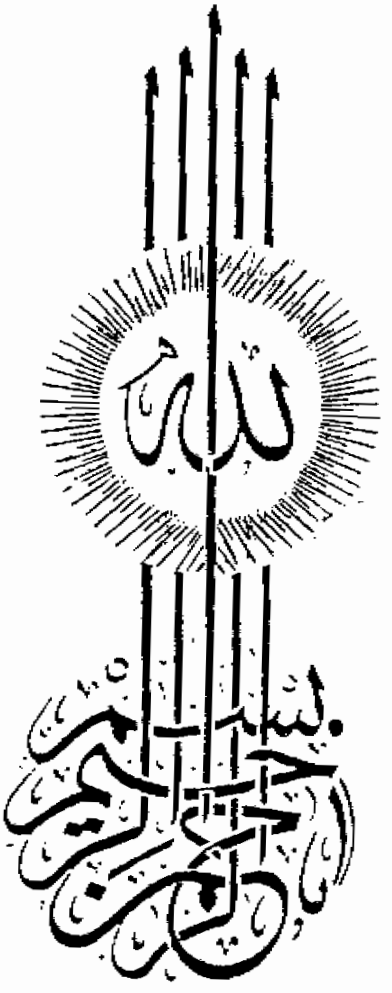

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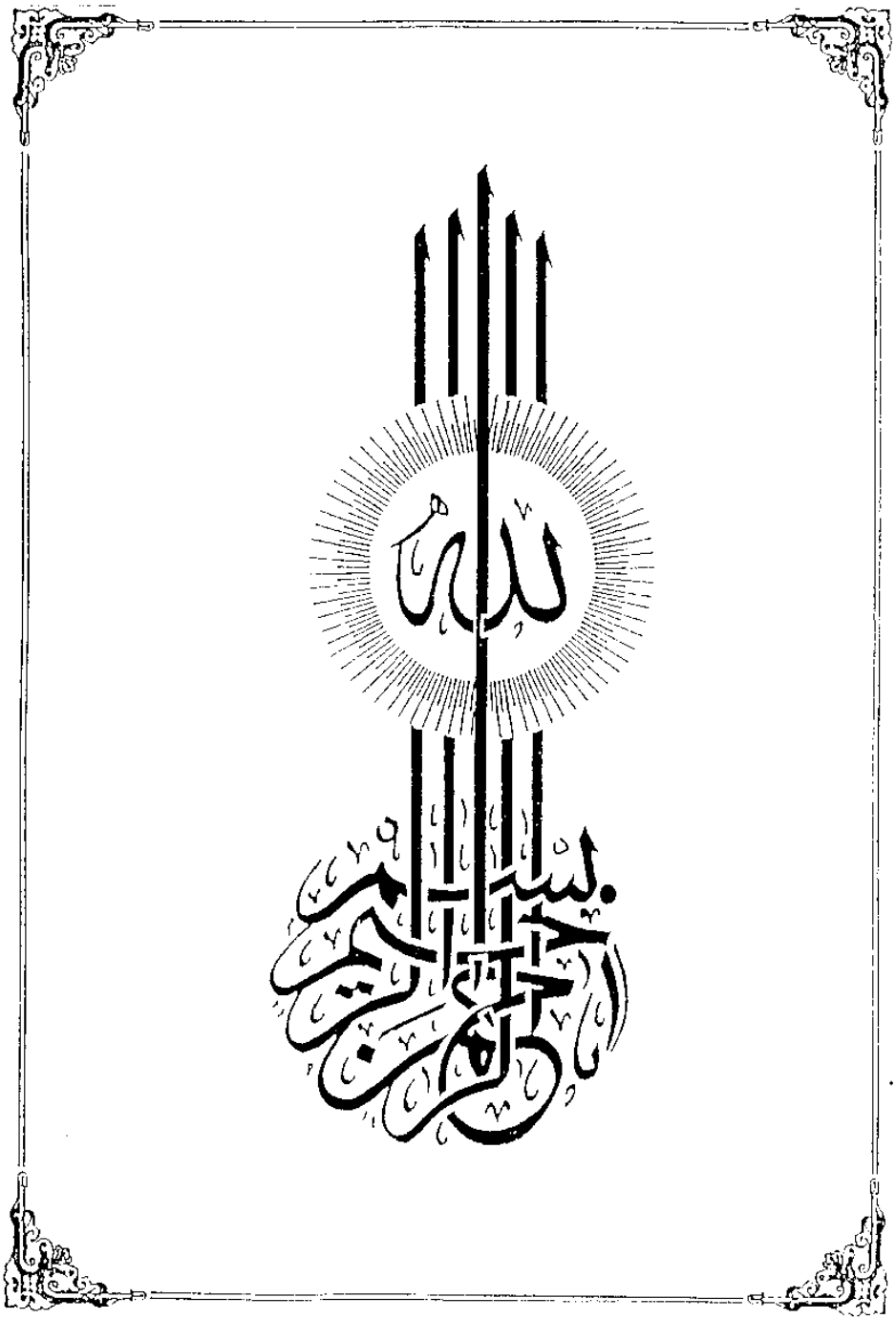

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# INTRODUCTION AND STUDY OBJECTIVE

## INTRODUCTION

Cephalopelvic disproportion (CPD) has been a recognized obstetric problem for hundreds of years. Throughout history it has accounted for many maternal and fetal deaths. Until cesarean section was introduced and perfected, CPD was one of the most dreaded complications of childbirth. Obstetricians have long sought a means of predicting CPD. The most popular predictive test during this century, X-ray pelvimetry, was widely used until recent years when its limited usefulness as a predictor of pelvic disproportion was recognized and the risks of fetal radiation exposure were better understood.

Keenedy and Greenwald (1981) pointed out that most obstetricians feel that CPD can only be diagnosed by an adequate trial of labour. However, clinical judgment by the obstetrician may dictate earlier intervention if pelvic contraction is apparent. Many indicators may be taken into account, such as fetal head level, clinical pelvimetry and general features of the patient.

It is a common feeling that as more indicators are used, the proper diagnosis becomes more secure. A simple measure, based on maternal height and foot size, as an indicator that the pelvis may not be adequate would be a useful addition to the other indicators already in use and if a relation between maternal height, shoe size and pelvic inadequacy could be established, diagnosis of CPD would be facilitated (Frame et al, 1985).

This will assist the clinician in abbreviating labour that is unlikely to terminate in vaginal delivery and hence, an extensive trial which may be exhausting to the mother and stressful to the fetus, may be averted by including these data in the process of decision-making.

**Study Objective:**

The aim of this study is to find out a relation, if any, between the maternal height and shoe size to be used as predictors of pelvic capacity and hence, the progress of labour.

# REVIEW OF LITERATURE

## I- OBSTETRIC ANATOMY OF THE PELVIS

Pritchard et al (1985) reviewed the obstetric anatomy of the pelvis. They mentioned that, the adult bony pelvis is composed of four bones: the sacrum, the coccyx, and the two innominate (hip) bones. The innominate bones are joined firmly to the sacrum at the sacroiliac joints and to one another at the symphysis pubis. The bony pelvis is divided into:

1- The false pelvis lies above the linea terminalis. It is bounded posteriorly by the lumbar vertebrae, laterally by the iliac fossae and in front by the lower portion of the anterior abdominal wall. It is of no particular obstetric significance.

2- The true pelvis lies beneath the linea terminalis and is the portion important in childbearing. It is bounded above by the promontory and alae of the sacrum, the linea terminalis and the upper margins of the pubic bones, and below by the pelvic outlet. The posterior boundary is the anterior surface of the sacrum, its upper anterior margin corresponding to the body of the first sacral vertebra, designated as the promontory. Normally, the sacrum possesses a marked vertical and a less pronounced horizontal concavity.

The lateral limits are formed by the inner surfaces of the ischial bones and the sacrosciatic notches and sacrosciatic ligaments. In front the true pelvis is bounded by the pubic bones, the ascending superior rami of the ischial bones and the obturator foramina.

Extending from the middle of the posterior margin of each ischium are the ischial spines that serve as valuable landmarks in determining the level of descent of the fetal presenting part into the true pelvis.

The descending inferior pubic rami unite at an angle of 90 to 100 degrees to form a rounded arch.

The anterior wall of the true pelvis at the symphysis pubis measures about 5 cm and its posterior wall about 10 cm.

**The pelvic axis:** with the woman upright, the upper portion of the pelvic canal is directed downward and backward and its lower course curves and becomes directed downward and forward.

**Pelvic inclination:** The pelvis is inclined at an angle of 55 degrees to the horizontal plane i.e. the normal

position of the pelvis, in the erect woman, is achieved when the anterior superior iliac spines and the pubic tubercles are placed in the same vertical plane.

**Planes and Diameters of the pelvis:**

The pelvis has long been described as having four imaginary planes: 1- The plane of the pelvic inlet. 2- The plane of the pelvic outlet. 3- The plane of greatest pelvic dimensions. 4- The plane of the mid-pelvis (least pelvic dimensions).

**Pelvic inlet:** It is bounded posteriorly by the promontory and alae of the sacrum, laterally by the linea terminalis and anteriorly by the upper margin of pubic bones and symphysis pubis. The diameters of the pelvic inlet are:

**Anteroposterior Diameters:**

1- **The anatomical anteroposterior diameter (the true conjugate) 11 cm.**

It extends from the middle of the sacral promontory to the middle of the upper border of the inner surface of symphysis pubis.

2- **The obstetric anteroposterior diameter (obstetric conjugate): 10.5 cm.**

It extends from the middle of sacral promontory to the most prominent point of the back of the symphysis pubis representing the shortest distance between the promontory and symphysis pubis through which the head must pass.

**Transverse Diameters:**

1- **Anatomical transverse diameter: 13 cm.**

It represents the greatest distance between the linea terminalis extending between the two widest points of the pelvic brim.

2- **Obstetric transverse diameter:**

It is the diameter occupied by the sagittal suture of the head, lies midway between the symphysis pubis and sacral promontory.

**Oblique Diameters:**

Each of them extends from one of the sacroiliac joint to the iliopectineal eminence on the opposite side of the pelvis. They average under 13 cm and are designated right and left according to whether they originate at the right or left joint.

**Pelvic Shapes:**

Caldwell and Moloy (1939) developed a classification of the pelvis according to radiological shape of the brim. These are:

1- **Gynecoid pelvis:** 50%

It displays the anatomic characteristics ordinarily associated with the female pelvis. The posterior sagittal diameter of the inlet is only slightly shorter than the anterior sagittal. The sides of the posterior segment are well rounded and the fore pelvis is also well rounded and wide. The transverse diameter of the inlet is either slightly greater than or about the same as the anteroposterior diameter so the inlet is either slightly oval or round. The side walls are straight, the spines are not prominent and the pubic arch is wide. The sacrum is inclined neither anteriorly nor posteriorly. The sacrosciatic notch is well rounded and never narrow.

2- **Anthropoid pelvis** 25%:

The anteroposterior diameter of the inlet is greater than the transverse, forming more or less an oval anterposteriorly, with narrow and pointed

anterior segment. The sacrosciatic notch is large. The side walls are often somewhat convergent, and the sacrum usually has six segments and is straight, making the anthropoid pelvis to be deep. The ischial spines are likely to be prominent. The subpubic arch is frequently narrow.

3- **Android type** 20%:

The posterior sagittal diameter at the inlet is much shorter than the anterior sagittal. The fore pelvis is narrow and triangular. The side walls are usually convergent. The ischial spines are prominent. The subpubic arch is narrowed. The sacrosciatic notch is narrow and high arched. The sacrum is set forward in the pelvis, usually straight with little or no curvature and the posterior sagittal diameter is decreased from inlet to outlet by the forward inclination.

4- **Platypelloid pelvis** 5%:

It is a flattened gynecoid pelvis with a short anteroposterior diameter and a wide transverse diameter. The angle of the forepelvis is very wide. The sacrum is short and well curved. The sacrosciatic notch is wide.

Mixed types of the pelves are much more frequent than pure types.