

Relationship between Umbilical Cord and Anthropometric Measurements of term Newborns : A Preliminary Study

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Abstract- Uteroplacental function and maternal environment are factors affecting fetal growth and development. They have influence on anthropometric measurements (AM) of newborns (NB). Aim of this study is to analyze relationship between umbilical cord (UC) parameters and AM of NB. Total of 52 pregnant women were selected from teaching hospital, Jaffna. Data like parity status, gender, birth weight, birth length, head circumference of NB, length and diameter of UC were taken. It was observed that mean birth weight of male was 3.0026 and female fetus was 2.8556 grams. Mean head circumference is 33.36. Length of NB ranges 39-56cm. Length of UC ranges 50-105cm. A positive correlation was found between length of UC and parity status of mother. UC diameter ranges 7.25-14.75mm. A positive correlation was observed between birth weight and UC diameter of NB. Mean value for UC diameter in male NB is 10.898mm and for female was 9.44mm, it was statistically significant.

Keywords - head circumference, newborn weight, umbilical cord diameter

I. INTRODUCTION

Healthy uteroplacental circulation is an important factor in producing a healthy fetus. Placenta is developing from both maternal and fetal component. After four weeks of gestation, the only link between the placenta and the fetus is the umbilical cord. It is a cylindrical structure with two arteries and one vein embedded in the gelatinous Wharton's jelly.

Umbilical cord is playing a role in determining the growth and wellbeing of the fetus [1].

To date several studies have been investigated the umbilical cord morphometry in utero. Nomograms for the diameter of the umbilical vessels have been reported by Weissman et al (1994) [2]. Raio et al (1999) have generated nomograms for sonographic diameter and cross sectional area of umbilical cord in uncomplicated pregnancies and reported a significant relationship between diameter and area of umbilical cord and fetal anthropometric parameters (Biparietal diameter, femur length, abdominal circumference)[3].

Pathological studies have demonstrated that fetuses with a thin umbilical cord on sonography during second and third trimester of gestation are at increased risk of adverse perinatal outcome [4]; [5]; [3]. A thin umbilical cord might be determined by a reduction of the amount of Wharton's jelly, by reduction of umbilical cord vessel's cross-sectional area or by both [5]. Changes or alterations of any of the components of Wharton's jelly have been described in some pathological conditions such as fetal growth restriction [4], fetal distress [6]. Moreover, the presence of a large umbilical cord diameter without alteration of the vessel's diameter has been reported in pregnancies complicated by gestational diabetes [7].

Fetal genetic structure, uteroplacental function and maternal environment are the main factors affecting fetal growth and development.

Indicators of the measurements which indicate that the normalcy of fetal development include physical characteristics of the newborn, such as birth weight, birth length, head circumference, thoracic circumference and abdominal circumference. However, the most common of these physical characteristics are birth weight, head circumference and birth length.

Birth weight is a particularly reliable indicator of intrauterine development and is one of the most important factors affecting physical and mental development of the baby.

Although some studies indicated a correlation between umbilical cord and fetal development, studies done by Emine et al., (2011) suggest that umbilical cord length has no effect on fetal development[8].

The purpose of the present study was to analyze the relationship between umbilical cord parameters and anthropometric measurements of the newborn.

