The role of the Ratio between Middle Cerebral Artery and Umbilical Artery Doppler in Predicting Neonatal Outcome in Prolonged pregnancies with Oligohydramnious

Thesis

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Contents

List of Abbreviations

Abbrev.	Full term
ACOG	: American College of Obstetricians and gynecologists
CRL	: Crown-rump length
CTG	: Cardiotocography
EDV	: End diastolic velocity
FHR	: Fetal heart rate
FVW	: Flow velocity waveform
IUGR	: Intrauterine growth restriction
MCA	: Middle Cerebral artery
NICU	: Neonatal intensive care unit (NICU)
NO	: Nitric oxide
PGE2	: Prostaglandins E2
PI	: Pulsatility index
PSV	: Peak systolic velocity
PSV	: Peak systolic velocity
RI	: Resistance index
UA	: Umbilical artery

List of Tables

List of Tables *(Cont...)*

List of Tables *(Cont...)*

List of Figures

List of Figures *(Cont...)*

Introduction

Prolonged pregnancy is defined as pregnancy that continues to or beyond 42 weeks (294 days) from the first day of last menstrual period or 14 days beyond expected date of delivery ***(Ilknur et al., 2009)***. However, recent data have shown that a significant percentage of cases of perinatal asphyxia occur between 40 and 42 weeks of gestation ***(Marija et al., 2007)***.

Post-term pregnancy is associated with significant fetal and maternal risks. Perinatal mortality [still birth plus early neonatal deaths increases about 4 folds in post-term pregnancies. Feto-placental insufficiency, asphyxia (with and without meconium)]. Intra-uterine infections contribute to this excess in perinatal deaths, also macrosomia increases in post-term pregnancies as well as 20-40% of post-term features do have post maturity syndrome ***(Hovi et al., 2006)***.

Maternal risk of prolonged pregnancy includes labour dystocia, an increased incidence of perineal injury and a doubling in the rate of caesarean delivery ***(Trigger et al., 2009)***.

Morbidity and mortality in post-term pregnancies are thought to be secondary to placental insufficiencies and thus several authors try to find a relation between fetal umbilical artery. Resistance index in prolonged pregnancies and adverse

perinatal outcome but they failed to demonstrate any relationship ***(Rightmire et al., 1987; Hitshold et al., 1988; Anteby et al., 1994)***.

It has been shown that there is a strong correlation between middle cerebral artery blood flow and fetal hypoxia which made assessment of middle cerebral artery blood flow a standard evaluation in cases of features of high risk of hypoxia ***(Hecher et al., 1995)***. However, information in prolonged pregnancy is a scarce.

This study aims at combining both middle cerebral artery Doppler assessment and umbilical Artery Doppler assessment in cases of post-term pregnancies with suspected hypoxia evidenced by oligohydraminous.

Aim of the Work

The aim of this work is to investigate MCA/UA ratio Doppler as a predictor of perinatal outcome in women with prolonged pregnancies with oligohydraminous.

Post-Term Pregnancy

Introduction:

Post-term pregnancy carries a series of complications for both the mother and the fetus, in the modern world physicians took into consideration of post term-pregnancy after the delivery of Princess Charlotte Augusta of Wales in 1817.

She was the only eligible heir to the British throne, and when her pregnancy was announced, the entire nation was closely following the most important event of that time.

At approximately 43 weeks her water broke and labor soon began spontaneously.

Contractions were weak and the first stage of labor lasted more than 50 hours. Gradually, the fluid became meconium stained. After 24 hours in the second stage of labor and after five hours of active pushing, she spontaneously delivered a stillborn boy. The baby appeared to have been dead for several hours. During the third stage, placenta was retained, and she had a post-partum haemorrhage from uterine atony. Princess Charlotte died approximately six hours after delivery.

Three months later her obstetrician, Dr. Croft, committed suicide, unable to bear the burden of the responsibility for the death of the British heir to the throne.

As this event resulted in the death of an infant, the mother and her physician, it has historically been referred to as the *"**The Triple Obstetric Tragedy" (Lancet et al., 1951).***

Figure (1): Princess Charlotte Augusta of Wales

Prolonged pregnancy is defined as pregnancy that continues to or beyond 42 weeks (294 days) from the first day of last menstrual period or 14 days beyond expected date of delivery ***(Ilknur et al., 2009)***. However, recent data have shown that a significant percentage of cases of perinatal asphyxia occur between 40 and 42 weeks of gestation ***(Marija et al., 2007)***.

The duration of gestation ranges from 280 to 290 days from the first day of the last menstrual period (forregular28-day

cycles). This duration is generally expressed as weeks of amenorrhea, therefore duration of pregnancy varies between 40^{+0} and 41^{+3} weeks ***(Le Ray et al., 2011).***

Postmaturity (or postmaturity syndrome) is a clinical condition describing an infant born post-term with a poorly functioning placenta. It has been suggested that postmaturity syndrome is really just fetal growth restriction in post-term fetuses.

The infant usually appears long and thin, with dry scaly skin and long finger nails, and in some cases there are meconium staining of the skin and membranes ***(Campbell et al., 1997).***

The incidence of post-term pregnancies is variable, in Europe and the United States, it ranges from 0.5% to 10%, varying by and within countries. These variations simultaneously show the diversity of the populations studied and the differences in obstetric practices between countries ***(Chantry et al., 2011).***

Early pregnancy dating by ultrasound and increasingly frequent practice of induction of labor both have jointly contributed to a progressive decrease in the incidence of prolonged and post- term pregnancies in most countries ***(Chantry et al., 2011).***