

**THE UNIVERSITY OF ZAMBIA  
SCHOOL OF MEDICINE  
DEPARTMENT OF ANATOMY**

**A COMPARATIVE GROSS ANATOMICAL STUDY OF  
PLACENTAE AND NEONATAL WEIGHT IN HYPERTENSIVE  
AND NON HYPERTENSIVE PREGNANT WOMEN AT THE  
UNIVERSITY TEACHING HOSPITAL, LUSAKA, ZAMBIA.**

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This dissertation of MWABA CHILESHE SIWALE on A COMPARATIVE GROSS ANATOMICAL STUDY OF PLACENTAE AND NEONATAL WEIGHT IN HYPERTENSIVE AND NON HYPERTENSIVE PREGNANT WOMEN AT THE UNIVERSITY TEACHING HOSPITAL, LUSAKA, ZAMBIA has been approved in partial fulfillment of the requirements for the award of the Degree of Master of Science in Human Anatomy by the University of Zambia.

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## ABSTRACT

### **A COMPARATIVE GROSS ANATOMICAL STUDY OF PLACENTAE AND NEONATAL WEIGHT IN HYPERTENSIVE AND NON HYPERTENSIVE PREGNANT WOMEN AT THE UNIVERSITY TEACHING HOSPITAL LUSAKA ZAMBIA**

#### **BACKGROUND**

Placenta is an organ that links the mother to the foetus facilitating gaseous exchange, uptake of nutrients and excretion. The placenta reflects intrauterine environment and its size varies depending on ethnicity, pathophysiology and birth weight. Hypertension in pregnancy affects the placental morphological changes and affects neonatal outcome. Placental weight is a significant determinant of birth weight. Birth weight is used as an indicator of intrauterine growth. This study aims to compare the gross anatomy of placentae and neonatal weight in hypertensive and non hypertensive pregnant women at the University Teaching Hospital, in Lusaka, Zambia.

**METHODS:** A case control study design was applied to 100 hypertensive participants and 100 normotensive women, making a total of 200. All the participants were aged between 18 and 44 years, gestational age was between 35 and 40 weeks. Placentas were examined immediately after delivery in the labour ward. The placentae were weighed, longest placental length measured and the maternal placental surface examined. The birth weight was measured. Independent sample T test and Pearson's Chi Squared test was used to compare the means of measurements in the two groups using birth weight as the dependent variable.

#### **RESULTS:**

Mean standard deviation of the placental weight in the study group was 454 ( $\pm 118.7$ ) grams and control group was 488 ( $\pm 114.1$ ) grams. Mean difference was statistically different with p value of 0.040. The mean placental diameter difference study group to control group was 18.6 ( $\pm 3$ ) cm to 19.5 ( $\pm 1.95$ ) cm, the difference was statistically significant with a p value of 0.013. The mean (SD) birth weight of the study to control group was 2.87 ( $\pm 0.61$ ) kg to 3.12 ( $\pm 0.45$ ) kg. The difference in birth weight was statistically significant with a p value of 0.000.

**CONCLUSION** The study established that there was a difference in placental measurements and birth weight among the hypertensive and normotensive mothers, with a p value less than 0.05. The differences in the means were statistically significant. Therefore it can be concluded that hypertension in pregnancy is associated to changes in the morphology of the placenta that consequently affects birth weight. The percentage of low birth weight was higher (31%) in the study group than the control (7%).

## **DEDICATION**

To all expectant women, child bearing is a life changing experience which should lead to a live healthy baby and mother, every mother has a right to safe motherhood.

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## **ACRONYMS AND ABBREVIATIONS**

ERES	Excellence in Research Ethics and Science
MOH	Ministry of Health
PIH	Pregnancy Induced Hypertension
RCOB	Royal College of Obstetricians and Gynaecologists
SD	Standard Deviation
UNZA	University of Zambia
UTH	University Teaching Hospital
WHO	World Health Organization

## CHAPTER ONE

### 1.1 INTRODUCTION

The placenta is an organ that facilitates gas exchange, uptake of nutrients and excretion between pregnant woman and the foetus; it also functions as an endocrine organ that produces hormones to sustain the pregnancy (Johnson and Taylor 2010). It is fully formed during pregnancy, at about the 12<sup>th</sup> week of gestation. At full term the placenta is discoid, 15-20cm in diameter, 2 to 3cm thick and weighs about 500-600grams (Sadler, 2012). Maternal surface of the placenta should be dark maroon in colour, with about 20 cotyledons. The foetal surface of the placenta should be shiny, grey and translucent; two membranes should be present the chorion and amnion (Sadler, 2012).

Management of the newborn begins before birth; important information is obtained at delivery after examination of the placenta and membranes. Yetter, 2008, emphasised that placental examination in the delivery room may provide important information in the immediate and subsequent care of the new born. Examination of the placenta immediately after birth is important as it gives better understanding of the pathologic conditions of the placenta and their relation to neonatal outcome. Gross and histological examination of the placenta plays an important role in analysing the cause of maternal and neonatal outcome (McDonald, 2009). The placenta reflects intrauterine environment and could be an indicator of adverse effects such as foetal distress, infections; and growth retardation. It also expresses foetal genotype and thus provides diagnostic information on chromosomal and genetic malformations (Baergen, 2007).

There are variations in placental measurements depending on variables such as ethnicity, pathophysiology and birth weight (Johnson and Taylor 2010, McDonald, 2009). Placental function may be compromised by a number of infections and conditions such as hypertension which in turn may affect the well being of the foetus. Hypertensive disorders of pregnancy are a group of disorders that affect women during pregnancy and are a major cause of maternal and foetal morbidity and mortality (Mustafa et al 2012, Ngoc et al 2012). Hypertensive disorders in pregnancy are classified into: gestational hypertension, chronic hypertension, pre-eclampsia and pre- eclampsia super imposed on pre existing hypertension (Mustafa et al, 2012). In pregnancy, hypertension is defined as a systolic of 140mm Hg or greater, or a diastolic of 90mmHg or any rapid rise in blood pressure of 30mm Hg systolic or 15mm Hg diastolic (RCOG, 2011). Hypertensive disorders accounts for 12% of maternal

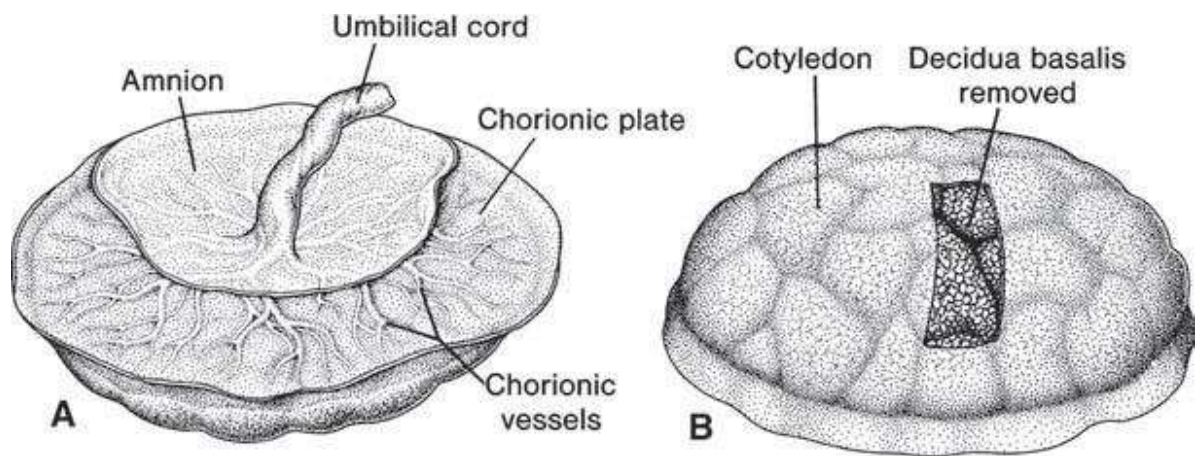
deaths UNICEF (WHO, 2000); and complications of the pregnancy include foetal growth retardation, neonatal respiratory difficulties, increased frequency of admission to neonatal intensive care unit and still births (Mustafa et al, 2012).

Hypertensive disorders of pregnancy have been attributed to abnormalities in placenta hence the need to examine the placenta (Peltonen and Peltonen, 1976). Roberts D.J. (2008) in his publication on placental pathology; has indicated that information from the placenta may be critical in early neonatal care and reproductive life; he also mentioned that placental information provides risk assessment for neurological outcome of the foetus.

Birth weight is used as an indicator of intra uterine growth, Roland et al 2012 in their study of singleton babies established that placental weight was a significant determinant of birth weight. Low birth weight is an important public health indicator, according to WHO 2004, low birth weight is birth weight less than 2,500grams. A low birth weight child is 20 times more likely to die than a child born with a birth weight more than 2,500grams (UNICEF, WHO, 2004, Wilcox, 2001). There are many causes that lead to low birth weight and they range from maternal and foetal factors. According to World Health Organisation (2004), the incidence for low birth weight in Zambia was 11%. University Teaching Hospital is tertiary hospital with more than 17, 000 births annually, according to records from UTH incidence of low birth weight for 2013 was 21% (UTH, 2014).

In 2000 a study was done in the University Teaching Hospital by Chanda N. to determine factors contributing to high incidence of low birth weight, results showed that there were many factors that lead to low birth weight, some maternal conditions included malaria which accounted for 16% of the low birth weight and hypertension accounted for 12% of the low birth weight. Chowa et al 2011 in their study to determine prevalence of hypertension among women of child bearing age in Zambia showed that the prevalence in Lusaka was 18.6%.

**Figure 1. Full term Placenta**



Source; Sadler T.W. (2012) Langman's Medical Embryology



## 1.2 STATEMENT OF THE PROBLEM

Hypertensive disorders in pregnancy account for most of the maternal and neonatal morbidity and mortality in developing countries, it accounts for 12 to 20 percent of total maternal deaths. Hypertension in pregnancy affects placental function and hence increases the risk of having a low birth weight neonate (Nag et al 2013) Neonatal mortality for Zambia is 34 per 1000 live births and infant mortality is 53 per 1000 live births (Central Statistic Office, 2010). Zambia has shown a steady decrease in infant mortality; the decrease in neonatal mortality however has not been significant. From 2006 to 2010 neonatal mortality rate reduced from 37 per 1000 births to 34 per 1000 births (CSO, 2010).

Neonatal survival is strongly dependent on the birth weight, the lower the birth weights the higher the chances of dying (Wilcox, 2001).

University Teaching hospital is a referral hospital, with annual deliveries of more than 17, 000. Table 1 shows the total number of deliveries, number of hypertensive women admitted at the obstetric unit and the number of the underweight born in 2013. The data shows that underweight prevalence 2013 is 21.4%.

**Table 1**

### **Annual report Obstetric dept 2013**

<b>Quarter</b>	<b>Total number of deliveries</b>	<b>Hypertensive women</b>	<b>Under weight</b>
First	5175	237	1068
Second	5322	192	1173
Third	5263	251	1152
Fourth	5232	222	1105
<b>TOTAL</b>	<b>20,992</b>	<b>902</b>	<b>4498</b>

**UTH RECORDS 2014**

## 1.3 JUSTIFICATION FOR THE STUDY

The study will provide information regarding the relationship between placental morphometrical measurements and neonatal birth weight in hypertensive women. The information will help health care providers in effective planning for neonatal care after birth when anticipating an underweight birth. Moreover, not much information is documented for the Zambian region regarding placenta weight and neonatal weight in hypertensive women. The results will also establish if placental findings have peculiar anatomical characteristics in

hypertensive and non hypertensive Zambian women attending the University Teaching Hospital (UTH) which could be used as a predictor of neonatal outcome.

#### **1.4 HYPOTHESES**

**Null hypothesis:** there is no difference in measurements of the placenta and weight of the baby between pregnant women who are hypertensive and those that are non hypertensive.

#### **1.5 GENERAL OBJECTIVE**

To compare gross anatomical measurements of the placenta and birth weight in hypertensive and non hypertensive pregnant women at the University Teaching Hospital Lusaka

##### **1.5.1 SPECIFIC OBJECTIVES**

1. To determine anatomical placental measurement in hypertensive women after delivery in relation to birth weight.
2. To assess anatomical placental measurements in non hypertensive women after delivery in relation to the birth weight.
3. To compare the anatomical placental measurements in hypertensive and non hypertensive women in relation to birth weight in both groups.

#### **1.6 Operational/Conceptual Definition of Terms**

1. Hypertensive Disorders of Pregnancy has been defined by a number of researchers but in this study the definition by (RCOB) was adopted.
2. Hypertensive Disorders of Pregnancy: Includes hypertension and pregnancy induced hypertension
3. A superimposed pregnancy induced hypertension may develop on those with hypertension.
4. Pregnancy induced hypertension (PIH): Which develops after 20 weeks of gestation.
5. Placenta is an organ of metabolic interchange between the foetus and the mother.
6. Low birth weight is a baby born with body weight below 2.5kg regardless of gestational age

## CHAPTER TWO

### 2.1 LITERATURE REVIEW

“Placenta is a temporary organ that joins the mother and foetus, transferring oxygen and nutrients from the mother to the foetus and permitting the release of carbon dioxide and waste products from the fetus” (William, 2008). Several studies have been done on the placenta and birth weight in hypertensive women, the studies have shown that there’s a positive correlation between placental weight and birth weight. Research has also indicated that birth weight is an indicator of child survival. In Africa, Nigeria Lagos a study was done in term singleton pregnancy of more than 1000 children, the study showed that there was a positive correlation between placental weight and birth weight, and that the ratio of birth weight and placental weight reduced with gestational age (Abubakar et al, 2012).

A number of maternal pathologies such as hypertensive disorders have an effect on placental function and consequently affecting birth weight. Hypertensive disorders of pregnancy have been attributed to abnormalities in placenta hence the need to examine the placenta (Peltonen and Peltonen, 1976). Roberts D.J. (2008) in his publication on placental pathology; has indicated that information from the placenta may be critical in early neonatal care and reproductive life; he also mentioned that placental information provides risk assessment for neurological outcome of the foetus. Studies done so far have indicated that placenta examination may give guidance to pregnancy related effects which affect the new born at and after birth (Lavery, 1997).

Hypertension in pregnancy is a high risk for both mother and child, as it increases the risk of morbidity and mortality in both. Nag et al 2013 in their study of morphological changes in the placenta of hypertensive pregnant women revealed that hypertension increased the risk of low birth weight.

Yetter J.F. (1998), in his publication of Examination of the Placenta emphasised the importance of examining the placenta in the delivery room for one minute, as this provides information that may be important to the care of the mother and infant. He also highlighted that the abnormal findings of the placenta, umbilical cord and membranes are associated with abnormal development and perinatal morbidity.

Pasricha N. (2012) conducted a comparative study of placental morphology and its co-relationship with foetal outcome in pregnancy induced hypertension in Lucknow, India. In his study 60 placentas were randomly selected, 30 controls and 30 from mothers with pregnancy induced hypertension. The results showed that that the mean placental weight, placental volume and mean birth weight in the study was lower than in the control group. And the incidence of still births was more in the study group. Researcher concluded that lighter placenta usually accompanied a low birth weight.

Majumdar S. et al 2005, in their study of placenta in normal and hypertensive pregnancies 100 placenta were studied to compare morbid and histological changes in placenta of 50 hypertensive mothers and 50 uncomplicated pregnancies. Results revealed that mothers with moderate to severe pregnancy induced hypertension had smaller, irregular placenta with marginal insertion of umbilical cord. The babies were small and a few had birth asphyxia.

Ghodke and Dharwadkar 2012 in their study of hypertensive disorders affecting the morphometry of placenta studied 100 placentas to compare morphometric changes in the placenta of 50 normal pregnant women and 50 pregnancy induced hypertension mothers in India. Results showed that there was a significant difference in the mean birth weight in the control and study group 2.81kg and 2.24kg respectively and the difference in mean placenta weight was also significant in the study group it was 320grams and the control was 410 grams. They concluded that maternal hypertensive disorders have a definite adverse influence on the morphometry of the placenta.

Al-Mamori (2010) in his study of macroscopic and microscopic study of placenta in normal and in pregnancy induced hypertension; 50 placentas were studied 25 study group and 25 control in Babylon Iraq . Results showed that placental morphometric parameters in the study group were reduced as follows. Mean placental weight in the study group to control group; 400.75 grams to 487 grams. Mean placental diameter in the study to control group; 16cm to 17.82 cm. Mean birth weight in the study to control group; 3.0 kg to 2.9 kg. They concluded that hypertensive disorders of pregnancy may be reflected on to the placenta.

Dadihich et al 2010, in their study done in India, on effects of eclampsia, hypertension and uncomplicated pregnancies on gross morphology of the placentas, 75 placentas were studied. The placenta were grouped into three; 25 eclamptic mothers, 25 chronic hypertension, and 25 uncomplicated pregnancies. The mean placental weight in eclamptic group was 326.20grams compared to chronic hypertension and uncomplicated pregnancies which had means of 419.44gram and 419.71 grams respectively. Mean placental diameter in the eclamptic group was 14.3cm and among the chronic hypertensive and uncomplicated pregnancies it was 17.7cm and 17.36cm. Results revealed that eclampsia severely affected placental weight, diameter and thickens as compared to hypertension and uncomplicated pregnancies

Balochi et al 2012 in their study to compare placentas from 40 hypertension associated pregnancies and 40 normal pregnancies. Results showed that placental weight, placental surface area and birth weight were significantly low in the study group. Mean placental weight in the study group to control group was 307.2 grams to 520.32 grams respectively. Mean placental diameter study/control group 15.82cm/16.39cm. And the mean birth weight in the study and control group was 2.92Kg and 2.50kg. They concluded that hypertension in pregnancy is associated with remarkable changes in the placentas.

Londhe P.S. and Mane A.B. (2011), in Karminage, Andhra Pradesh in India also studied 300 placentas. They conducted a cross sectional descriptive study of the placentas and its correlation in 150 normal and 150 hypertensive pregnancies. Their findings revealed that weight and volume were significantly lower in hypertensive group and that placental weight and size are directly proportional to the birth weight of the babies.

Gupta S and Gupta P. (2012), in their study in Barode correlation of placental weight and foetal outcome in pregnancy Induced Hypertension deduced that (PIH) adversely influences weight of the placenta and foetal outcome. They concluded that the placenta acts as an effective indicator by which we can predict status of the infant in neonatal life.

Kishwara S. et al (2009) in their descriptive study of morphological changes of the placenta in pre-eclampsia, 60 placentas were studied; 30 from a control group of pregnant women with no complications and 30 from a study group comprising pregnant women with preeclampsia. Results showed that placenta underwent definite morphological changes.

Udainia A. et al (2004) carried out a study in India to find out the relationship between placental surface area infarction and foetal distress in pregnancy induced hypertension with its clinical relevance. They examined a total of 99 placentas, 75 from pregnancy complicated with PIH and 24 from uncomplicated pregnancies. Results showed that the mean surface area was significantly less in severe hypertension and placental infarctions were present in all pregnancies which were complicated with PIH. They concluded that severity of hypertension adversely affects placental function and foetal outcome.

Salgado et al (2004) in Sri Lanka, in their case control study of effects of placental infarcts on the foetal outcome in pregnancy complicated by hypertension, they investigated a total of 350 placentas, 150 from normotensive pregnancies and 200 from pregnancies complicated by hypertension. Results revealed that placental infarcts were higher in hypertensive group and that there was an association between placental infarcts and low Apgar score, reduced birth weight, and head circumference. They concluded that infarctions had an adverse effect on growth and development of the new born.

Goswami et al (2012) conducted a study in Jamshoro in Pakistan to see the morphological changes in excessive placental calcification in PIH and its relation with neonatal outcome. They investigated a total of 80 placentas, 40 from pregnancies complicated with pregnancy induced hypertension and 40 from uncomplicated pregnancies. The results showed that foetal outcome in terms of birth weight to PIH were poor.

In Greece, a comparative study was carried out by Krielessi et al (2012), on placental pathology and blood pressure levels in women with hypertensive disorders, a total of 110 placentas were examined 55 from women with mild hypertension and 55 from women with severe hypertension. They compared the extent of placental lesions and levels of blood pressure. Results showed that more placental lesions were observed in the group with severe hypertension. They concluded that placental lesions correlated with severity of the hypertension and that blood pressure level mirrors placental function.

According to Barker et al (1990), in their prospective cohort study of foetal and placental size and risk of hypertension in the United states of America results showed that intrauterine environment has an effect on blood pressure in adult life - this was noted in small babies with large placenta who developed hypertension.

A study done in Brazil in women with systemic arterial hypertension showed that there were vascular changes in the placental bed which correlated to diminish birth weight (Ramos et al, 1995).

Studies done on the placenta have shown a number of morphological changes due to hypertension. The changes observed in the placenta in hypertensive women had a correlation on the neonatal outcome and birth weight. Most of the studies sighted were performed in Asian countries.

Zambia is a developing country with a high maternal mortality rate and neonatal mortality. Hypertensive disorders in pregnancy are one of the major causes of admission to Obstetric and neonatal intensive care units, due to the effects on the foetus and mother. Chowa et al in their study of prevalence of hypertension among women of child bearing age in Lusaka reviewed that the prevalence rate was at 18.6 percent. Central Statistical Office, 2010\_has estimated neonatal mortality at 34 per 1000 live births. There's need to study the placenta in our own settings to find out the relationships of placental size and the birth weight in hypertensive women, as there is inadequate information available for the Zambian setting. This information will help manage pregnant women and neonates born from hypertensive women.

## **CHAPTER THREE**

### **3.0 METHODS AND MATERIALS**

#### **3.1 Study Design**

An analytical cross-sectional study design was used in this study. Analytical cross sectional study measures association between exposure and outcome. Exposure and outcome are assessed simultaneously.

#### **3.2 Study Setting**

The study was conducted in the Department of Obstetrics, labour ward at the University Teaching Hospital (UTH), Lusaka, Zambia. The site was selected purposely because of the convenience and ease of access to facilities.

#### **3.3 Target and Study Population**

The target population included all women with and without hypertension that had delivered at UTH during the study period of 6 months.

The total study population was 200 participants, which included 100 hypertensive and 100 non hypertensive pregnant women in labour who had delivered, present at the time of the study.

##### **3.3.1 Inclusion criteria**

- All mothers with confirmed hypertension, and pregnancy induced hypertension in the labour ward at the UTH.
- All non-hypertensive pregnant woman who are 18 years or over
- Gestational age 32 weeks to 40 weeks
- Singleton pregnancy
- All children born (alive and dead) from hypertensive women and non hypertensive women

##### **3.3.2 Exclusion Criteria**

- Twin pregnancy
- Mothers with renal disease, diabetes and overt cardiac or respiratory disease.



### **3.4 Sample selection and size**

The sampling frame comprised all women admitted to the UTH Labour ward after delivery. The participants in the study group with hypertension were selected using a simple random sampling method; the participants in the study group without hypertension were selected within same range of gestation age as the hypertensive group. The method was to ensure that each participant had an equal chance of being included in the sample.

### 3.4.1 Sample Size Calculation

Based on an expected incidence of hypertension among child bearing age of 20 percent and 10 percent in pregnant women; the sample size was 100 participants from each group in order to have 80percent power using  $\alpha = 0.05$

The sample size was calculated as follows;

$$N = \frac{\sqrt{[u^2 \pi_1(1-\pi_1) + \pi_0(1-\pi_0) + \frac{v^2}{2\pi(1-\pi)}]}^2}{(\pi_0 - \pi_1)}$$

Where:

N = size of each group

$\pi_0, \pi_1$  Proportions,  $\pi$  = Average of the proportions

u = 0.84 for 80% power

v = Z statistic = 1.96 if  $\alpha = 0.05$

$$= \frac{\sqrt{[0.84^2 0.10(1-0.10) + 0.20(1-0.20) + \frac{1.96^2}{2(0.15)(1-0.15)}]}^2}{(0.20-0.10)^2}$$

$$= \frac{0.42 + 0.9878}{0.0196}$$

$$0.0196$$

$$= \frac{1.9878}{0.01}$$

$$0.01$$

$$= 98$$

=100 participants from each Group.

### **3.5 DATA MANAGEMENT**

Data was collected and recorded on the data collection sheet. Participants were interviewed and their case records reviewed to record their blood pressure and any antihypertensive drugs being taken and diagnosis of the type of hypertensive disorder was entered. All placentas and membranes were collected and examined immediately after delivery by the researcher and two (2) research assistants (midwives) and the birth weight was measured immediately after birth. The placental measurements for each participant and birth weight for each neonate were recorded on the data collecting sheet. The data was coded and entered in Microsoft excel.

#### **3.5.1 Data Collection Tool**

A data information sheet was used to collect demographic data, obstetric history, clinical data, and entering of measurement results of the maternal weight, and blood pressure reading and birth weight of the neonate.

##### **3.5.1.1 Validity**

To ensure validity, all the independent variables as well as the confounders were considered in this study by capturing them in the interview schedule during data collection and data analysis.

##### **3.5.1.2 Reliability**

The same data information sheet and method of collecting data was used on all the participants. The same baby scale, Sphygmomanometer, placental scale was used on all participants and there neonates.

#### **3.5.2 Data Collection Technique**

Two midwives were recruited as research assistants and oriented for three days on data collection using the data information sheet.

The research assistants and other staff in labour ward were sensitised on the whole process of data collection so as to ensure that placentas were secured after delivery. This also ensured that the normal standard of care of the participants was not compromised in any way. This process was done every day.

### **3.5.3 Participant selection**

Participants who were hypertensive were recruited before active labour began, as most of them were admitted for induction of labour and those that were non hypertensive were recruited after delivery. The midwife (assistant researcher) and the researcher sorted out all women and made a list for the eligible women who met the criteria. The participant's anthropometric measurements were checked by the researcher and the midwife and these included weight, and blood pressure.

### **3.5.4 Standard Operating Procedure for examining the placenta**

The control group comprised 100 placentas from pregnant women with uncomplicated pregnancies, normal blood pressure, and no proteinuria and without oedema. The study comprised 100 women with hypertensive disorders of pregnancy. Obstetric and medical histories were reviewed for all participants; women with blood pressure at or above 140/90 mm of Hg or rise of 15mmHg in the diastolic blood pressure, on at least two occasions from time of pregnancy, with or without oedema and /or proteinuria comprised the study group. Immediately after delivery all the placentas were collected in a clean tray. Any abnormality of cord and membranes were noted. Shape of the vessels, the site of umbilical cord insertion, and the membranes if it is complete or not, colour of the foetal surface, meconium stain, the shape of the placental disc, maternal surface if it is complete or not, number of cotyledons, presence of calcification were recorded. The membranes and cord at their attachment to the placenta were trimmed off. The placenta was gently expressed so as to remove its blood content and then washed thoroughly under tap water, mopped with dry cotton pad and weighed. Weight of placenta was recorded in grams by the same weighing scale, diameter of the placenta was measured using a metal ruler in centimetres, this was done after the placenta was made to rest on the maternal surface and the longest diameter was measured and recorded. The placental surfaces were inspected by the researcher who is a midwife in the presence of a second experienced midwife. The researcher is a midwife, placental surfaces (maternal and foetal) were inspected in the presence of another midwife, taking note of calcifications whether present or absent. The morphometric parameters of the placenta were recorded using standard procedures in the presence of two midwives. At the time of delivery baby birth weight was measured and recorded. The Apgar score was established by delivering midwife/obstetrician at one minute after delivery, the researcher recorded the findings as per records. After examining the placenta, all placentas and membrane were discarded following

the labour ward protocol of disposing human tissues in black plastic backs secured for incineration.

### **3.5.5 Anthropometric Measurements**

The weight of the participants was measured using a ZT-160 adult weighing mechanical scale model (Wuxi Weighed Factory Co., Ltd, Zhejiang, and China). After delivery the birth weight of the all neonates was measured using an infant automatic scale (Atom Inc Tokyo, Japan)

Placentas were weighed using an Electric compact scale XES1000A.Xin Jeng China.

Examination of the placenta was done by the researcher and the midwife. Placental examination included weighing, measuring the diameter and observing the foetal and maternal surface. This was confirmed by a 2<sup>nd</sup> midwife. Cord length was measured using a measuring tape. The blood pressure was measured using the Citizen Digital Blood Pressure Monitor (Citizen Systems Japan Co., Ltd, Tokyo, Japan).

### **3.5.6 Data Analysis**

#### **Statistical processing of data:**

Following data collection, the pre-coded data information sheet was double checked daily for completeness, consistency, legibility and accuracy. Numerical codes were used on the data collection sheet. The data collected was entered and stored into the data editor of IBM SPSS and statistically analyzed using IBM SPSS Statistics for Windows Version 20.0 (IBM Corp. Armonk, NY, and USA). The software statistical package enabled the researcher to obtain a data set for birth weights and placental measurements for the hypertensive and non hypertensive, and demographic data for the participants

The two groups which were being compared i.e. the hypertensive and the normotensive women were dichotomized as the control and the study group. Birth weight, placental diameter, placental weight and placental maternal surface measurements were analyzed as continuous and categorized variables. The means for birth weights, placental weight and placental length were compared in both groups using independent sample t test. Placental maternal surface was dichotomized, to measure association between hypertension and changes on the maternal placental surface Pearson's Chi-Squared were used. The

assumptions of random sample, adequate sample size and cell count and approximate normality of data for these tests were met.

### **3.6 Ethical and Cultural Considerations**

The approval to carry out the study was sought from the Excellence in Research Ethics and science (ERES) and the Director, Directorate of Research and Postgraduate studies. Permission to conduct the study was obtained from the Senior Medical Superintendent of UTH and the head of the Department Gynaecology and Obstetrics at UTH. There was very negligible interference to the participants beyond the general standard of clinical care offered by UTH in labour ward.

Written informed consent was obtained from the participants before the study. The researcher/research assistants introduced themselves and explained to participant the purpose and nature of the study. The participant was assured of confidentiality and that no names or any form of identification was to appear on the data information sheet. Moreover, each participant was assigned a unique confidential study number, which was used when collecting and reporting data.

## **CHAPTER FOUR**

### **4.1. RESULTS**

This chapter presents the results demonstrating the mean birth weight, mean placental weight, placental diameter and the findings on the maternal placental surface among the hypertensive mothers (study group) and the normotensive mothers (control). Thereafter the results show the differences in mean birth weight and placental measurements among the hypertensive mothers (study group) and normotensive mothers (control group). The mean differences and association of the findings between the study and control groups was determined by independent sample T test and Pearson's Chi-squared test.

#### **4.1.1. CHARACTERISTICS OF THE PARTICIPANTS THE HYPERETENSIVE (STUDY GROUP) AND THE NORMOTENSIVE (CONTROL GROUP)**

The study comprised a total of two hundred (200) participants out of which 100 were hypertensive and 100 normotensive women. Most (92%) were aged between 18 to 34 years; gestational age ranging from 35 to 40 weeks and 49% of the hypertensive group and 51% of the normo tensive had 2 to 5 children. The hypertensive group had a mean (SD) diastolic blood pressure of 94mmHg ( $\pm 14.4$ ) while the normotensive had 73mmHg ( $\pm 9.0$ ).

**Table 2: Demographic Characteristics and obstetric history of Participants**

Variable	Hypertensive women (study group) n = 100		Normotensive women (control group) n = 100	
	Frequency	(%)	Frequency	(%)
<b>Age</b>				
15-34years	92	92	90	90
35- 49years	8	8	10	10
<b>Maternal weight</b>				
≤ 49.9Kg	4	4	4	4
50-74.9kg	58	58	66	66
>75Kg	38	38	30	30
<b>Gestational age</b>				
35-37weeks	39	39	23	23
38-40weeks	61	61	77	77
<b>Parity</b>				
Para 1 (1 child)	38	38	41	41
Multi-para (2-5children)	49	49	51	51
Grand- multipara (> 5 children)	13	13	8	8

As shown in table 2, most of the participants in both groups study and control groups were between 15 – 34 years. Most of the participants had gestational age between 38 and 40 weeks. On average all participants had 2 to 5 children in both groups.

**Table 3 Diastolic blood pressure (mmHg) and mean (SD) among the study and control group**

	Hypertensive	Normotensive
Range of diastolic pressure mmHg	67 - 159	55 - 90
Mean (standard deviation)	94(±14.4)	73 (±9.0)

Hypertensive group had the highest upper limit diastolic blood pressure than the normotensive. There was a difference in the mean diastolic blood pressure between the two groups.



#### 4.1.2 BIRTH WEIGHT AND PLACENTAL MEASUREMENTS IN THE HYPERTENSIVE AND NORMOTENSIVE GROUP.

The study had a total of 200 participants i.e. 100 participants from each group. Placental measurements among the hypertensive group showed a mean (SD) placental weight of 454 grams ( $\pm 118.4$ ) and normotensive had 488grams ( $\pm 114.1$ ). The placental mean (SD) disc length was 18.6cm ( $\pm 3.0$ ) among the hypertensive and 19.5cm ( $\pm 1.95$ ) among the normotensive. Mean (SD) birth weight among the hypertensive was 2.87kg ( $\pm 0.66$ ) while among the normotensive it was 3.12kg ( $\pm 0.45$ ) as shown in Table 5.

**Table 4 Birth weights and Placental measurements among the study and control groups**

Variable	Hypertensive	Normotensive
	(study group) n=100	(control group) n=100
	Frequency/%	Frequency/ %
<b>Birth weight</b>		
Low (<2.5kg)	31(31%)	7(7%)
Normal (2.6-3.5kg)	64(64%)	77(77%)
Big (>3.6kg)	5(5%)	16(16%)
<b>Placental weight</b>		
Lowest – 499g	71(71%)	61(61%)
500-599 g	14(14%)	21(21%)
600g and above	15(15%)	18(18%)
<b>Placental diameter cm</b>		
15 – 19.9cm	72(72%)	63(63%)
20 – 29.9	28(28%)	37(37%)

The table shows that the hypertensive group had more placentas with reduced weight and diameter and had more babies with low birth weight.

**Figure 2 Distributions of birth weights of neonates from the hypertensive and normotensive women**

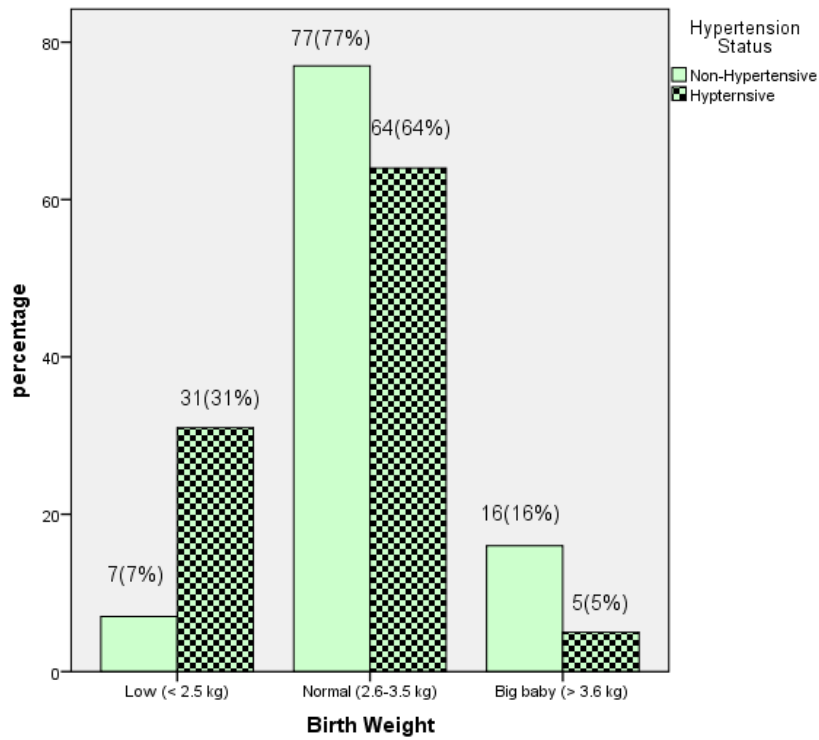


Figure 2 shows that neonates born from hypertensive women were more likely to have a low birth weight compared to normotensive women.

**Table 5 Mean and standard deviation of birth weights among the hypertensive and normotensive groups**

	<b>Hypertensive</b>	<b>Normotensive</b>
<b>Variable</b>	<b>Mean standard deviation</b>	<b>Mean standard deviation</b>
Birth weight kg	2.87 (±0.66)	3.12 (±0.45)
Placental weight g	454.7(±118.8)	488.7(±114.1)
Placental diameter cm	18.6(±3.0)	19.5(±1.95)

Table 5 shows that there was a difference in mean (SD) in the birth weight between, placental weight and diameter between the two groups.

**Table 6 Neonatal outcome and maternal placental surface findings of the hypertensive and normotensive groups**

<b>Variable</b>	<b>Hypertension (study group) n = 100 Frequency/%</b>	<b>Normotensive (control group) n = 100 Frequency/%</b>
<b>Apgar score</b>		
Severe asphyxia <3	4(4%)	1(1%)
Moderate asphyxia 4-6	19(19%)	9(9%)
No asphyxia 8-9	77(77%)	90(90%)
<b>Outcome of birth</b>		
<b>Non hypertensive</b>		
Alive	97(97%)	100(100%)
Dead	3(3%)	0(0%)
<b>Placenta maternal surface</b>		
<b>Non hypertensive</b>		
Normal	35(35%)	74(74%)
Abnormal	65(65%)	26(26%)

The table above shows that the hypertensive group had more placentas with abnormalities than normotensives had more babies with moderate to severe asphyxia and still births.

#### 4.1.3. COMPARISON OF THE MEAN PLACENTAL MEASUREMENTS AND BIRTH WEIGHT OF NEONATES BORN FROM THE HYPERTENSIVE AND NORMOTENSIVE WOMEN.

Independent sample T test was used to test mean differences in the hypertensive and normotensive. To test for strength of association between hypertension and maternal placental surface was done using Pearson's chi Squared test the Phi and Cramer's V test were done to ensure normality of data. When using independent sample T test Levene's test for equality was used and variability in the 2 conditions was not significantly different making it a good statistical test.

**Table 7 Comparison of the means between the hypertensive and the normotensive group**

Variable	Hypertensive women (study group) n=100		Normotensive women (control group) n = 100		<i>p- values</i>
	Mean	Standard deviation	Mean	Standard deviation	
Birth weight kg	2.87	± 0.61	3.12	± 0.45	0.000*
Placental weight g	454	± 118.7	488.7	± 114.1	0.040*
Placental diameter cm	18.6	± 3.0	19.5	± 1.95	0.013*
Diastolic pressure mmHg	94.44	± 14.36	73.17	± 9.08	0.000*

\*Independent samples Test indicates significant p value at  $p < 0.05$

The table above shows that the difference in the means is statistically significant between the hypertensive and the normotensive group with p – value less than 0.05. Table 7 presents results for the comparisons made between the hypertensive and normotensive groups. The results demonstrate that there was statistical significant difference in mean (SD) of birth weight among the hypertensive and normotensives with a p value of .000. Placental measurement means in the two groups also show a statistical significant difference in the two groups as shown in the table with a p value less than 0.05.

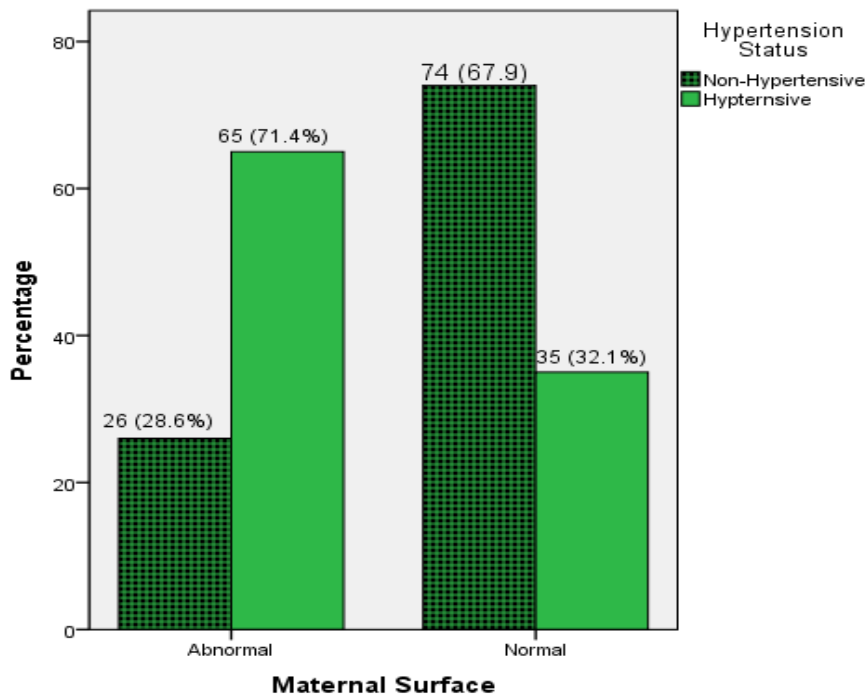
**Table 8 Maternal placental surface findings among the hypertensive and the normotensive groups**

<b>Placental maternal surface</b>	<b>Hypertensive (study group) n = 100</b>	<b>Normotensive women (control group) n = 100</b>	<b><i>p-value</i></b>
<b>Abnormal % within maternal surface</b>	65(71.4%)	26 (28.6%)	.000*
<b>Normal % within maternal surface</b>	35 (32.1%)	74(67.9%)	

\*Pearson's Chi-Squared Test. Indicates significant *p*-value at  $p < 0.05$

**Table 8:** shows statistical significant association of maternal placental surface findings of the hypertensive and normotensive group, indicating that hypertension may predispose to development of placental surfaces.

**Figure 3 Maternal placental surface findings among the hypertensive and the normotensive groups**



The figure above shows that the hypertensive group had more abnormal maternal placental surface than normotensive women.

**Table 9 Apgar score of the neonates of the hypertensive and normotensive group**

Apgar score	Hypertensive (study group) n = 100	Normotensive (control group) n= 100	<i>p- value</i>
Severe asphyxia	4(4%)	1(1%)	0.041*
Moderate asphyxia	19(19%)	9(9%)	
No asphyxia	77(77%)	90(90%)	

\*Pearson’s Chi-Squared Test. Indicates significant *p*-value at  $p < 0.05$

P value was significant as it was less than .05, but the strength of association was weak which indicated by Phi and Cramer’s V.

## CHAPTER FIVE

### 5.1 DISCUSSION

The study measured placental weight, placental diameter examined maternal placental surface in both the hypertensive and normotensive groups. It also measured the birth weights in both study and control group. There after mean placental measurements and mean birth weight were compared in the study and control groups. This section provides answers to the above specific objectives.

Most of the participants were between 18-34years 182 (91%) table 2. The participants were aged between 18 to 44 years with a mean (SD) age of 25.4years ( $\pm 6.37$ ), indicating that most participants are in the child bearing age which is 15 to 49 years according to World health organisation. Fifty percent of the participants had 2 to 5 children. Gestation age was between 35 to 40 weeks. The non hypertensive participants had mean (SD) diastolic pressure of 73mmHg ( $\pm 9.0$ ) while the hypertensive group mean (SD) was 94mmHg ( $\pm 14.4$ ).

The first objective of this study showed that among the normotensive group (control group), at mean gestational age of  $38.8 \pm 1.96$  weeks: the mean placental weight was  $488 \pm 114.1$ grams, mean placental diameter was  $19.5 \pm 1.95$ cm and the maternal placental surface showed that only 28.6% had calcifications and infarctions. The mean birth weight was  $3.12 \pm 0.45$ kg. These findings were similar to the findings found in other studies, a study done by Al-Mamori (2010), in Iraq revealed that in normotensive women mean (SD) placental weight was 487g ( $\pm 39.13$ ), placental diameter 17.82cm ( $\pm 6.82$ ) and birth weight was 3.0kg ( $\pm 0.23$ ). a study done by Ghodke and Dharwadker (2012) in India showed that mean (SD)placental weight was 410g and mean (SD) birth weight was 2.81kg. Abubakar et al 2010 in Nigeria, done in normal pregnancy, and their findings showed that at mean gestational age of  $38.8 \pm 1.1$ , mean placental weight was  $590 \pm 82$ grams, mean birth weight of  $3.28 \pm 0.47$ kg. Another study, done in India by Ashwin U and Sundari 2009 in normal pregnancy showed that at gestation of 37 to 42 weeks mean placental weight was 518.21grams and mean birth weight of  $2.94 \pm 0.42$ . The mean birth weights in the different studies showed that the birth weights were within 2.8 and 3.0Kg. Mean placental weight on the other showed that it was variable in different countries, in line with Johnson and Taylor 2010, McDonald, 2009, who indicated that there are variations in placental measurements depending on variables such as ethnicity, pathophysiology and birth weight. A medical embryology text book on other hand has indicated that at full term the placenta is discoid, 15-20cm in diameter, and weighs about

500-600grams (Sadler, 2012). There's need for each country to carry a research and establish the mean placental measurements and birth weights as baseline data.

The **second** objective looked at placental measurements and birth weight among the hypertensive (study group). In the hypertensive group (study group) results showed that at mean gestational age of  $37.7 \pm 1.96$  mean placental weight was 454grams ( $\pm 118.7$ ), mean (SD) of the placenta diameter was 18.6cm ( $\pm 3$ ). On examination of the maternal surface among the study group, results showed that 71% of the placentas had abnormalities that ranged from calcifications and infarctions, and only 32% were normal. The mean (SD) birth weight was  $2.87 \text{kg} \pm (0.61)$ . These findings were similar to other studies done. The results showed that the mean placental measurements and birth weights were less than those in the control group, suggesting that hypertension in pregnancy is associated with placental morphological changes. These findings were similar to what other researchers found in other countries, Nag et al 2013 in their study in India established that hypertension in pregnancy was associated to placental morphological changes which were also related to neonatal outcome. Dadhich A. et al 2010 in India found that eclampsia and chronic hypertension in pregnancy affected weight, diameter and thickness of the placenta.

The third objective was to compare the mean placental measurements and birth weight in the hypertensive and normotensive study group. Comparisons of the means were done using Independent sample t test and Pearson's Chi squared test at p value less than 0.05. Mean (SD) placental weight in the study group to control group was 454 ( $\pm 118.7$ ) grams to 488( $\pm 114.1$ ) grams. Mean difference was statistically different with p value of 0.040. The mean placental disc length difference study group to control group was 18.6( $\pm 3$ ) cm to 19.5( $\pm 1.95$ ) cm, the difference was statistically significant with a p value of 0.013. Mean (SD) birth weight of the study to control group was 2.87 ( $\pm 0.61$ ) kg to 3.12( $\pm 0.45$ ) kg. The difference in birth weight was statistically significant with a p value of 0.000. These findings were similar to other studies like Al- Mamori 2010 in Iraq studied placentas in normotensive women and women with pregnancy induced hypertension his results revealed that mean placental diameter was reduced study to control group 16cm to 17.82cm, placental weight study to control group 400grams to 487 grams and birth weight study to control group 3.0kg to 2.9kg. Other researchers like Nag et al 2013, Pasricha 2012, and Kiswara et al 2005 also found similar findings. Placental maternal surface also showed some changes in both hypertensive and non hypertensive groups. The results in the present study showed that there was a difference in



measurements of the placenta and weight of the baby between pregnant women who are hypertensive and those that normotensive. Hence the researcher rejected the null hypothesis.

Other findings showed that among the study group 31 out of the total 100 neonates had birth weight less than 2.5Kg, which translated to 31%. While from the control 7 out of 100 neonates had birth weight less than 2,500grams which translated to 7%. WHO, 2004 defines low birth weight baby as a baby born weight less than 2.5kg regardless of gestation age. The study also revealed that hypertension affected the outcome of the baby, this assessed by Apgar score at one minute after delivery. Apgar score among the non hypertensive group was good as 90% of the neonates were more than 8. And among the hypertensive 77 % had a good Apgar score, 3 were still births among the hypertensive group. The findings were similar to Gupta and Gupta 2012, Udainia 2004, and Salgado 2004 who showed that hypertension affected neonatal outcome and low Apgar score.

## **5.2. Conclusion**

The study showed that:

1. Normotensive group (control group): at mean gestational age of 38 weeks: the mean placental weight was 488g; mean placental diameter was 19.5cm and the mean birth weight was 3.12kg.
2. Hypertensive group (study group): at mean gestational age of 37 weeks; mean placental weight was 454g; mean placenta diameter of 18.6cm and mean birth weight of 2.87kg.
3. The last objective compared the findings of the control and study group, results showed that there was a statistical difference in the mean placental weight between control and study group with a p value 0.040. The mean placental disc length was different and statistically significant with a p value of 0.013. There was also a significant difference in the mean birth weight p value of 0.000.

Neonates born from hypertensive women were more likely to have a low birth weight compared to normotensive women and there was a statistically significant association of maternal placental surface findings of the hypertensive and normotensive group, indicating that hypertension may predispose to development of placental surfaces

The study had some limitations. Gestational age used in the study was calculated based on the woman's last menstrual period which mothers are expected to recall sometimes may not be accurate. The study was carried out on a limited study population. Only the participants who delivered at the UTH during the three months of data collection were sampled.

## **5.3. Recommendations**

As a measure to improve the management and prevention of low birth weights, the following recommendations are made based on the findings of this study:

1. Each health facility conducting antenatal care should have a sphygmomanometer to ensure regular blood pressure checks for early detection and control raised blood pressure.
2. Health care providers involved in assisting deliveries to ensure proper examination of the placenta immediately after birth with particular attention paid to recording the morphology and the changes that take place on the surfaces.

#### **5.4. Future Research**

Future research should focus on the following:

1. Histopathology of the placenta from women with hypertension in pregnancy.
2. Population based studies on placental/birth weight ratio in relation to birth outcome.
3. Ultrasound based studies on pregnant women to compare placental morphology and foetal weight.
4. To do specific studies for the 2 types of hypertension in pregnancy as seen in pre-eclampsia and eclampsia and the effect on placental morphological changes.
5. A study to determine possible vascular changes in the umbilical vessels associated with hypertension.

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## **INFORMATION SHEET**

**Title of study;** A comparative gross anatomical study of placenta and neonatal weight in hypertensive and non hypertensive pregnant women at University Teaching Hospital Lusaka Zambia.

Dear participant

This is to inform you about the study and to request you to take part in this study that is being carried out by Mrs Chileshe Mwaba who is a student at the University of Zambia, School of Medicine, and Department of Anatomy. The study involves examining the placenta in women with hypertension and those with without hypertension of pregnancy. High blood pressure may affect the placenta (after birth) and further affect weight of the baby. Several factors have been associated with the increase in the number of cases. However, causes of pregnancy induced high blood pressure are not well understood. Therefore, efforts should be made in reducing the effects on the infant.

Initially, your antenatal records will be reviewed and you will be interviewed to determine your health status, information on your age, sex (gender), past medical history, family history, and common symptoms, and your general condition.

After delivery your placenta (after birth) will be collected and examined, by the researcher with the presence midwife; or obstetrics. Weighing will be done and recorded and the general condition of the baby determined.

There will be no direct monetary gain to you by participating in this research. The placenta (after birth) examination findings will be used to gather information which will contribute to management of hypertensive disorders of pregnancy and the neonates. Your participation in this study is purely voluntary and therefore, you are eligible to withdraw if you are not interested and your action will not affect your acquisition of health services.

Please seek clarification where you do not understand. All the information you will provide will be strictly confidential. The research information will be disseminated to the relevant authorities and with no direct link to you since anonymity shall be maintained.



## INFORMED CONSENT

Dear participant,

My name is Mwaba Chileshe S, I am a student enrolled in the Master of Science in Anatomy Programme in the Department of Anatomy at the School of Medicine, University of Zambia.

In partial fulfilment of the Masters of Science in Anatomy programme, I am required to undertake a research project. My study topic is to determine various characteristics of the placenta following the birth of the child and to weigh the child

You have been conveniently selected to participate in this study and I wish to inform you that participation in this study is voluntary and you are free to withdraw at any stage of the study if you so wish. You will be asked some questions regarding your health during pregnancy. Any information you give me will be kept confidential and no name will be written on the interview schedule.

You will not receive direct benefits from the study or monetary gain. If you have any queries, please contact me on I ..... hereby understand the guidelines and I am willing to participate in the study.

Dated this .....day of .....2013

Signature/ thumb print of respondent.....

Signature of interviewer.....

### A. PERSONS TO CONTACT FOR PROBLEMS

1. Mwaba Chileshe S. (Mrs), University of Zambia, School of Medicine, Department of Physiological Sciences, P.O. Box 50110, Lusaka, Telephone Numbers-0977 766 787 or 0955 788 030.
2. The Chairperson, ERES Converge, 33 Joseph Mwilwa Road, Rhodes Park, Lusaka, Tel: +260 955 155 633, +260 955 155 634, +260 966 765 503, Email: [eresconverge@yahoo.com](mailto:eresconverge@yahoo.com).

**INFORMATION SHEET AND CONSENT TRANSLATED IN CHEWA  
KUFOTOKOZA**

**MUTU WA PHUZIRO:KUYANJANITSA MA ONEKEDWE YA VIBALILO NDI KALEMEDWE KA ANA POBADWA MU AZIMAI ALI NDI MATENDA NDIPOSO ALIBE MATENDA OTHAMANGISA MAGAZI MU AZIMAI ALI NDI PAKATI PA UNIVERSITY TEACHING HOSPITAL,LUSAKA, ZAMBIA.**

Kwa otengako mbali,

Tikudziwitsani ndi kukupephani kutengako mbali kukafufuku ocitidwa ndi **Amai Chileshe Mwaba**, omwe achita ma phuziro apamwamba(Masters of Science) pa University of Zambia, School of Medicine, ku Department of Anatomy. Kafukufuku kaona pa kupima vibalilo mu azimai ali ndi pakati komanso ali ndi matenda onkhakha mwazi(*hypertension*) uonetsetsa momwe hypertension imaonongela chibalilo ndi mwana ali mumimba. Pali mabvuto ambiri omwe amalengetsa numeru ya azimai omwe ali ndi matenda aya kuchuruka koma chenicheni chomwe chilengetsa kukwela kwa kuthamanga kwa mwazi mu azimai ali ndi pakati sichidziwika bwino-bwino. Ndichofunikira kuchepetsa mabvuto amene amapezeka pa mwana chifukwa chakuthamanga kwa mwazi.

Choyamba ndikuona pa umoyo wanu pakukufusani mafunso akhudza inu monga zaka zanu,matenda omwe munadwalapo ndi zina zace kuti ndi dziwe za nthanzi lanu.

Mutabala, chibalilo chanu chidzapimidwa ndi oyanganira kafukufuku pa maso pa anasi kapena asing'anga oona pa amai ali ndi pakati. Kalemedwe ka chibalilo ndi maonekedwe ace azatengedwa.

Dziwanu kuti Kulibe malipilo amutundu uli onse monga ndalama kuli omwe atengako mbali pa ma phuziro awa pakuti kutengako mbali ndikodzipereka kwa ulele. Muli nayo danga yozichotsa pakutengako mbali pa maphuziro aya pa nthawi ili yonse mwafunira kopanda chifukwa chilichonse. Zopezeka muphiziroli zizathandiza pakuyang'anira azimai ali ndi pakati ndi kunchinjiriza mabvuto ali onse pa ana ao. Mau ali onse ndi zotulukamo zizasungidwe mwa chisinsi, ndiponso zizaperekedwa ku oyang'anira apamwamba kopanda kukutomorani inu munjira ili yonse.

## **KUMVOMEKEZA**

Kwa otengako mbali,

Ine dzina langa ndine **Mwaba Chileshe S.**, Ndikuchita maphuziro a *Masters* mu *Anatomy* ku *school of medicine*, pa *University of Zambia*.

Ndichofunikira pa maphuziro anga kuchita kafukufuku. Kafukufuka kaona pa maonekedwe osiyanasiyana pa chibalilo mwana atabadwa ndi kalemedwe ka mwana'yu.

Mwasakhidwa kutengako mbali ku phuziro iyi. Ndifunaso kukudziwitsani kuti kusankhidwa kwanu ndi kozipereka pa inu nokha ndipo muli nao danga yozichotsapo pa maphuziro aya pa nthawi ili yonse mwafuna. Mudzafusidwa mafunso okhuza umoyo wanu pomwe muli ndi pakati. Dziwani kuti nsonga ili yonse kapena mau ali onse adzasungidwa mwachisinsi ndiposo dzina lanu sidzachulidwe ngakhale kulembedwa papela iri yonse.

Simudzalandila malipiro munjira iri yonse ngakhale ndalama.

Ngati muli ndimafunso tumani lamya pa 0977 766 787 kapena pa 0955 788 030.

Ine \_\_\_\_\_ Ndamvetsetsa  
ndondomeko zones ndiponso ndine ufunitsitsa kutengako mbali ku phunziro iri.

Tsiku lino la \_\_\_\_\_, 2013.

Chitsimikizo cha oyakha \_\_\_\_\_

Chitsimikizo cha ofunsa \_\_\_\_\_

## **PERSONS TO CONTACT FOR PROBLEMS**

3. Mwaba Chileshe S. (Mrs), University of Zambia, School of Medicine, Department of Physiological Sciences, P.O. Box 50110, Lusaka, Telephone Numbers-0977 766 787 or 0955 788 030.
4. The Chairperson, ERES Converge, 33 Joseph Mwelwa Road, Rhodes Park, Lusaka, Tel: +260 955 155 633, +260 955 155 634, +260 966 765 503, Email: [eresconverge@yahoo.com](mailto:eresconverge@yahoo.com).

## DATA INFORMATION SHEET

I.D Number: \_\_\_\_\_

Age: \_\_\_\_\_

Gravida: \_\_\_\_\_

Parity: \_\_\_\_\_

Gestational age: \_\_\_\_\_

Weight \_\_\_\_\_

Blood pressure readings past three reading: 1<sup>st</sup> \_\_\_mmHg 2<sup>nd</sup> \_\_\_mmHg 3<sup>rd</sup> \_\_\_mmH

### PAST MEDICAL HISTORY

Medical condition	Yes	No
Pregnancy induced Hypertension		
Chronic hypertension		
Diabetes mellitus		
Asthma		

### COMMON SYMPTOMS

Medical condition	Yes	No
Headache		
Swelling of feet		
Heart Palpitation		

### GENERAL EXAMINATION

Blood pressure	
Pulse	
Pallor	
Jaundice	
Pedal oedema	
Any other abnormality	

**Baby**

Time of delivery \_\_\_\_\_

Sex: M/F

Apgar score \_\_\_\_\_

Birth weight \_\_\_\_\_ grams

Outcome; Alive/ Dead

**Placenta, cord and membranes**

Cord insertion \_\_\_\_\_ cm from margin (or cm in membranes from margin)

Cord length \_\_\_\_\_ cm

No. of vessels \_\_\_\_\_

Cord colour: \_\_\_\_\_ (white, green, yellow, brown)

No. of cord twists in 6 \_\_\_\_\_ cm

Other cord findings \_\_\_\_\_ (knots, nodules, masses, etc)

Membranes inserted \_\_\_\_\_ (marginally, circummarginate, circumvallate)

Membrane rupture site cm to margin \_\_\_\_\_

Membrane colour \_\_\_\_\_

Other membrane findings \_\_\_\_\_ (nodules, haemorrhage, membranous vessels, etc)

The trimmed placental weight is \_\_\_\_\_ g

Disk measurement cm in greatest diameter \_\_\_\_\_ cm

Thickness \_\_\_\_\_ cm

Foetal surface findings \_\_\_\_\_ (nodules, masses, chorionic vascular thromboses, etc)

Maternal surface \_\_\_\_\_ (disrupted, masses, calcification, fibrin, hematomas, indentations, etc)

Parenchyma \_\_\_\_\_ (normal \_ beefy, spongy, red; lesions number, size, percent of mass involved, location)

Other findings: