

A study of placental weight and foetal outcome in different grades of pregnancy induced hypertension

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Abstract

Placenta is a fetomaternal organ which is vital for maintaining pregnancy and promoting normal development of the fetus. The weight of the placenta is functionally significant because it is related to villous surface area and to fetal metabolism. Present study has done to record the placental weight and co-relate with the corresponding fetal weight.

In the enrolled study group total 80 placentae were evaluated. From that 40 placentae are pregnancy induced hypertension and 40 are from the normal group patients. In normal pregnant women the weight of foetus is observed as 2.5 – 3.5 kg with the placental weight of 420 – 650 gm. In Severe PIH group of women placental weight is seen as 330-580 gm with the foetal weight of 2.9 – 2.9 kg. In the Mild PIH pregnant women the weight of the placenta is seen as 405-610 gm with the foetal weight ranging from 2.4 – 2.8 kg.

Placental weight was significantly reduced in pre-eclamptic pregnancies and it was directly correlated with foetal birth weight. So, hypertensive disorders of pregnancy adversely influence the placental weight, which ultimately, adversely influence the maternal and perinatal outcomes.

Keywords: pre-eclamptic pregnancies, Placental Weight, pregnancy induced hypertension, PIH etc.

Introduction

The placenta (also known as afterbirth) is an organ that connects the developing fetus to the uterine wall to allow nutrient uptake, provide thermo-regulation to the fetus, waste elimination, and gas exchange via the mother's blood supply, fight against internal infection and produce hormones to support pregnancy. The placenta provides oxygen and nutrients to growing babies and removes waste products from the baby's blood. The placenta attaches to the wall of the uterus, and the baby's umbilical cord develops from the placenta. The umbilical cord is what connects the mother and the baby. Placentas are a defining characteristic of placental mammals, but are also found in some non-mammals with varying levels of development.

Placenta is a fetomaternal organ important for conserving pregnancy and endorsing normal development of the foetus. The placenta links the emerging fetus to the uterine wall to allow nutrient acceptance, waste elimination and gas exchange via the mother's blood supply [1]. Normal fetal development and endurance depends on the appropriate development and function of the placenta. During its growth during the gestation, placenta undergoes diverse alterations in weight, structure, shape and function uninterrupted [2]. The health conditions like, hypertension, diabetes, etc. obscures the pregnancy. Also this affects maternal health and may affect the functionality of the placenta. The valuable information can be obtained from the examination of the placenta about the perinatal health of the baby and the mother [3].

Toxemia of pregnancy or pregnancy induced hypertension (PIH) is one of the foremost cause of death among mothers and foetuses. Various studies on placenta have shown that placental weight is directly related to foetal weight. Placenta in PIH

mothers is irregular, small in size with marginal attachment of umbilical cord.

Gestational hypertension or pregnancy-induced hypertension (PIH) is the development of new hypertension in a pregnant woman after 20 weeks gestation without the presence of protein in the urine or other signs of preeclampsia [1]. Hypertension is defined as having a blood pressure greater than 140/90 mm Hg.

Gestational hypertension is usually defined as having a blood pressure higher than 140/90 measured on two separate occasions, more than 6 hours apart, without the presence of protein in the urine and diagnosed after 20 weeks of gestation. Pre-eclampsia is gestational hypertension plus proteinuria (>300 mg of protein in a 24-hour urine sample). Severe preeclampsia involves a blood pressure greater than 160/110, with additional medical signs and symptoms. HELLP syndrome is a type of preeclampsia. It is a combination of three medical conditions: hemolytic anemia, elevated liver enzymes and low platelet count. This is when tonic-clonic seizures appear in a pregnant woman with high blood pressure and proteinuria [4]. Pre-eclampsia and eclampsia are sometimes treated as components of a common syndrome.

Hence present study was planned to record the placental weight and co-relate with the corresponding fetal weight.

Methods

The pregnant women from the Nalanda medical College & Hospitals were included in this study. The present study was done on placentae collected from labor room and operating theatre of the department of Obstetrics & Gynaecology. All the subjects enrolled into the study are informed consents. The mothers were studied clinically for height, weight, blood

pressure, pulse etc. along with recording of their medical history. Their lab investigation reports were noted. The placenta with cord and membranes were collected and observed immediately after the delivery. Any abnormality of the umbilical cord and membrane was noted.

The following is the Inclusion Criteria for the enrolled in to the study group.

Group A: Control Group: The pregnant women’s having blood pressure in the range of the 140/90 mm and without any oedema and without any Proteinureais selected for the study as control group.

Group B: Pre-eclampsia: In this group the pregnant women’s selected had blood pressure more than the normal range 140/90 mm and with and without oedema and Proteinurea.

Group C: Eclampsia: In this study Convulsions with Pre-eclampsia are observed Gestational age is more than 42 weeks and less than 36 weeks patients were excluded from the study and the patients with multiple pregnancies. These types of the patients are not included in the study.

Results & Discussion

In the enrolled study group total 80 placentae were evaluated. From that 40 placentae are pregnancy induced hypertension and 40 are from the normal group patients. The data generated from the both the study group is presented as below.

Table 1: Comparison of Placentae weight

Weight of Placentae	Control group	Pregnancy induced Hypertension (PIH) Group	
		Severe	Mild
Less than 200 gm	0	1	1
200-300 gm	3	2	3
300-400 gm	7	6	13
400-500 gm	15	2	7
500-600 gm	12	1	3
More than 600	3	0	1
Total	40	12	28

The table 1 includes the data of the different placental weight in the control study group and the pregnancy induced hypertension group. The less than 200 gm placenta weight is observed in 2 cases in study group. 200-300 gm placenta weight is observed in 3 control group patients and 2 in severe PIH cases and 3 in mild PIH cases. Placental weight of 300-400 gm is seen in 7 normal cases; and 6 in severe PIH cases and 3 in mild PIH cases. Placental weight of 400-500 gm is observed in the 15 control study group patients and 2 in severe PIH cases and 7 in mild PIH cases. The 500 – 600 gm placental weight is recorded in the 12 normal cases and 1 in severe and 3 in mild PIH cases. More than 600 gm of placental weight is seen in 3 cases in normal study group and in 1 case in mild study group patients.

Table 2: Observation of weight of the placentae in different group

	Weight of placenta	Weight of Foetus
Control	420-650gm	2.5-3.5 kg
Severe PIH	330-580gm	2.3 – 2.9 kg
Mild PIH	405-610gm	2.4- 2.8 kg

The table 2 represents the weight of placenta and weight of foetus in the selected study group patients. In normal pregnant women the weight of foetus is observed as 2.5 – 3.5 kg with the placental weight of 420 – 650 gm. In Severe PIH group of women placental weight is seen as 330-580 gm with the foetal weight of 2.9 – 2.9 kg. In the Mild PIH pregnant women the weight of the placenta is seen as 405-610 gm with the foetal weight ranging from 2.4 – 2.8 kg.

Dutta KD *et al*, observed that babies weighing less than 2.5 Kg were seen in 22.73% cases of eclampsia, 13.3% in mild eclampsia and 6.25% in control groups [5].

Fox (1964) reported, hypertrophy of placental mass in response to chronic hypoxia on hypertensive patients. This hypertrophy along with LBW contributes to low fetal placental weight ratio [6].

Hosemann reported placental weight of 400-1000 grams in normal term pregnancy [7] whereas Wigglesworth reported 360-570 grams of placental weight in normal term pregnancy [8].

Hypertensive disorders of pregnancy are one of the leading causes of maternal morbidity or mortality and perinatal morbidity or mortality. The aetiopathogenesis of hypertensive disorders of pregnancy still remains a subject of controversy. The classical view in this regard focuses on the placenta and the utero placental circulation. Although the study of the placenta is, retrospective in nature, yet it provides a reflection of hazards the foetus has been subjected to during its growth and development. Normally a placenta weighs from 400 to 800gms. This study observed the reduction of placental weight in the hypertensive disorders.

Placental weight shows marked variation in all the groups and coefficient of variation was higher in severe PIH group but mean weight was less with increased severity of PIH. Baby weight shows marked variation in all the groups and coefficient of variation was increased with severity of PIH and mean weight was less with increased severity of PIH. From the present study it can be concluded that, the pregnancy induced hypertension adversely influences the weight of the placenta and foetal outcome. Thus placenta acts as an effective index by examination of which we can predict the status of Foetus in neonatal life as it can act as an indicator to the overall development of the Foetus in PIH cases.

Placental weight was significantly reduced in pre-eclamptic pregnancies and it was directly correlated with fetal birth weight. So, hypertensive disorders of pregnancy adversely influence the placental weight, which ultimately, adversely influence the maternal and perinatal outcomes.

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