

## Comparative Study of the Histopathology on Placenta in Normotensive and Hypertensive Pregnancies

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### Abstract

**Objective:** The main objective of the present study to investigate that the histopathological differences in normotensive and hypertensive pregnancies. **Research Design:** A prospective case-control observational study designed was used in current study. **Sample:** The present study was conducted in total 200 inpatients in the Department of Gynaecology and Obstetrics, Institute of postgraduate medical education and research with associated S.S.K.M. Hospital Kolkata city in West Bengal, India. **Statistical Analysis:** Descriptive, chi-square test and Fisher exact test applied on data analyses. **Result:** Finding of the result in current study indicated that the shape of placenta was not found to be statistically significant, commonest mode of cord-insertion was central but it was statistically not significant. The incidence of retro-placental hematoma was increased in the hypertensive group with p-value<0.003, it is highly significant. The incidence of infraction was increased in the hypertensive group with p-value<0.001, it is highly significant. The incidence of calcification was increased in the hypertensive group with p-value<1.000, it is statistically not significant. **Conclusion:** The present study concluded that the hypertensive disorders of pregnancy adversely influence the morphology of the placenta. The study reveals that the placental weight and fetal

weight are significantly less in hypertensive group than the normotensive group.

**Keyword:** Histopathological; Normotensive; Hypertensive; Pregnancies.

### Introduction

Hypertensive disorders of pregnancy are common and form one of the deadly tried, along with hemorrhage and infection which greatly contributes to maternal mortality and morbidity[1].

In addition, hypertensive disorders of pregnancy are strongly associated with fetal growth restriction and prematurity, thus contributing to perinatal mortality and morbidity [2].

The identification of this entity and management plays a significant role in the outcome of pregnancy both for the mother and the baby [3].

The Placenta is an important fetal organ which is an intermediate link between the fetus and the mother. Proper functioning of the placenta is a must for the proper growth and development of the fetus in utero. The general role of the placenta in the maintenance of pregnancy is well understood but in recent years research has tended to concentrate on certain special aspects of its function [4].

### Objective

The main objective of the present study to investigate that the histopathological differences in normotensive and hypertensive pregnancies.

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### *Study Design*

A prospective case-control observational study designed was used in current study.

### **Method**

#### *Sample*

The present study was conducted in total 200 inpatients in the Department of Gynaecology and Obstetrics, Institute of postgraduate medical education and research with associated S.S.K.M. Hospital Kolkata city in West Bengal, India.

#### *Sample Selection Technique*

The sample was designed according to the case-control group and observational study group. The criteria below mentioned in the criteria-

#### **Inclusion Criteria of Sample**

*Control Group:* Pregnant women ages are 18 to 40 years. The pregnancies are at 28-42 weeks of the gestational period. Blood pressure was less than 140/90mmHg of all participants involved in the study. No any medical disorders such as diabetes, renal disease, hypertension, singleton pregnancy and were vertex presentation.

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#### *Tools and process of data collection*

After delivery placenta with attached membrane and the umbilical cord was collected, washed in running tap water to clean all blood, labeled and cut into vertical segments of 2cms thickness from maternal to fetal surface to ensure adequate fixation and then it was fixed in 10% formalin for 4 to 6 weeks. For morphological studies the size, shape, surface area, weight, diameter, thickness, placental- fetal ratio, sub-chorionic fibrin, and retro-placental hematoma of placenta will be noted along with the inspection of marginal veins for any thrombus, the number of cotyledons condition of membranes, presence of infarction, calcification, and site of insertion of umbilical cord will be noted.

### *Tools*

Clinical data-  
History  
Clinical examination

### *Investigation*

- a. Placental analyses
  - i. Macroscopically using paraffin blocks.
  - ii. Microscopically using hematoxylin and eosin stain under a binocular light microscope.
- b. Tissues taken from the placental site for histopathological studies-
  - i. Near the implantation of the umbilical cord
  - ii. Margins- 12, 3, 6, 9 O'clock
- c. Central region of placenta
- d. Umbilical cord at placental junction and cut end

### *Statistical Analyses*

Purpose of the present study the descriptive, chi-square test and Fisher exact test in applying for data analyses.

### **Result**

A hypertensive disorder of pregnancy is the one of leading causes of maternal mortality and morbidity and perinatal mortality and morbidity. Although the study of the placenta is retrospective in nature, yet it provided a reflection of hazards the fetus has been subjected to during the period of growth and development.

The observation of finding is showing in the following tables-

Reveal that the table 1 has showing in the hypertensive patients in placental shape oval is 41.00%, it is lower than the normotensive persons (52.00%) and placental round shape in the hypertensive patients 59.00%, it is higher than the normotensive persons 47.47%. It is obviously clear that the hypertensive pregnancies are higher in placental round shape. Shape of placenta was not found to be statistically significant.

Reveal that the table 2 has showing in the hypertensive patients in cord-insertion eccentric 32.00%, battledore is 2.00% and central is 66.00% hypertensive and the normotensive persons 23.00% eccentric, 1.00% battledore and 76.00% central,

hypertensive patients central cord-insertion lower than the normotensive persons. It is obviously clear that the hypertensive pregnancies are higher in eccentric cord insertion. The commonest mode of cord-insertion was central but it was statistically not significant.

Reveal that the table 3 has showing in the hypertensive patients sub-chorionic fibrin is 1.00% it is lower than the normotensive patients (6.00%). This finding was not significant.

Reveal that the table 4 has showing in the hypertensive patient's retro-placental hematoma 14.00%, it is higher than the normotensive patients (2.00%). The incidence of retro-placental hematoma was increased in the hypertensive group with p-value<0.003, it is highly significant.

Reveal that the table 5 has showing in the hypertensive patients' infraction 43.00%, it is higher than the normotensive patients (5.00%). The incidence of infraction was increased in the hypertensive group with p-value<0.001, it is highly significant.

**Table 1:** Showing the types of placental shape

Placental Shape	Oval	Round	Total
Hypertensive	41	59	100
Row %	41.00%	59.00%	-
Normotensive	52	47	99
Row %	52.53%	47.47%	-
Total	93	106	-

Fisher's exact test 2-tailed p-value 0.119

**Table 2:** Showing the types of cord insertion

Cord Attachment	Eccentric	Battledore	Central	Total
Hypertensive	32	2	66	100
Row %	32.00%	2.0%	66.00%	-
Normotensive	23	1	76	100
Row %	23.00%	1.00%	76.00%	-
Total	55	3	142	200

Fisher's exact test 2-tailed p-value 0.285

**Table 3:** Showing the sub-chorionic fibrin

Sub-chorionic fibrin	Present	Absent	Total
Hypertensive	1	99	100
Row %	1.00%	99.00%	-
Normotensive	6	94	100
Row %	6.00%	94.00%	-
Total	7	193	200

Fisher's exact test 2-tailed p-value 0.118.

**Table 4:** Showing the retro-placental hematoma

Retro-placental hematoma	Present	Absent	Total
Hypertensive	14	86	100
Row %	14.00%	86.00%	-
Normotensive	2	98	100
Row %	2.00%	98.00%	-
Total	16	184	-

Fisher's exact test in 2-tailed p-value 0.003.

**Table 5:** Showing the infraction

Infraction	Present	Absent	Total
Hypertensive	43	57	100
Row %	43.00%	57.00%	-
Normotensive	5	95	100
Row %	5.00%	95.00%	-
Total	48	152	-

Fisher's exact test in 2-tailed p-value <0.001.

**Table 6:** Showing the calcification

Calcification	Present	Absent	Total
Hypertensive	31	69	100
Row %	31.00%	69.00%	-
Normotensive	23	77	100
Row %	23.00%	77.00%	-
Total	54	146	-

Fisher's exact test in 2-tailed p-value 1.000.

Reveal that the table 6 has showing in the hypertensive patient's calcification 31.00%, it is higher than the normotensive patients (23.00%). The incidence of calcification was increased in the hypertensive group with p-value<1.000, it is statistically not significant.

### Discussion

It is difficult to define the normal placental findings and differentiate it from the abnormal, because of the structural complexity and rapid evolution of the placenta [2]. Another study suggested that the placental pathology is quantitative rather than qualitative [6,7]. Simillar studies investigated the significance of placental findings only when these had a bearing on the fetal outcome. Studied the morphological changes of the placenta in hypertensive disorder of pregnancy in total 80 placenta, concluded the finding of the study were suggested that placental changes are directly proportional to the duration of the disease process and its severity and fetal outcomes is adversely influenced by pathological changes in placenta [8]. Findings of the study of placenta in hypertensive pregnancies were shown to be deviation on weight and other morphological [9].

Another study find that the 60 placenta of toxemia of pregnancy and 20 normal cases in histopatological, the study were concluded that placental pathology and morphologically worsens with the progression of hypertensive [10]. Similar study was finding the reduction in the fetoplacental weight ratio in the hypertensive group [8,13]. Das noted that the increased incidence of sub-chorionic fibrin, but did not affect the fetal outcomes. In this study there was a definite increased in the incidence of infraction in the hypertensive pregnancies [8]. Reported that the higher incidence of retroplacental hematoma in pre-eclampsia [11,12]. Das found a little higher incidence of the calcification in hypertensive group [8]. Mohan found the frequency of calcification in higher in the hypertensive group [12].

### Conclusion

The present study concluded that the hypertensive disorders of pregnancy adversely influence the morphology of the placenta. The study reveals that the placental weight and fetal weight are significantly less in hypertensive group than the normotensive group.

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