

Hypertensive disorders of pregnancy and its effect on the placenta in Indian women

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Abstract

Objective: The main objective of the present study is to grossly examine the placenta of normotensive and hypertensive pregnancies.

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

Method: 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 number of preterm delivered cases belonged to hypertensive group the chi-square test is significant and the p-value is 0.032.

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: Normotensive, Hypertensive and 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. In addition, hypertensive disorders of pregnancy are strongly associated with fetal growth restriction and prematurity, thus contributing to perinatal mortality and morbidity. The identification of this entity and management plays a significant role in the outcome of pregnancy both for the mother and the baby.

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.

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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 candidates involved in the study. No any medical disorders such as diabetes, renal disease, hypertension, singleton pregnancy and were vertex presentation.

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Exclusion Criteria of Sample:

Control Group: Participants were excluded in control group of any type of medical disorders as diabetes mellitus, renal disease, hypertension, cardiovascular disease, pregnancy associated with other disorder, and twin pregnancies.

Study Group: Patients were excluded in a study group on no other types of disease such as diabetes mellitus, renal disease, cardiovascular disease, pregnancy associated with other medical disorder and twin pregnancies.

Tools and Process of 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:

- Routine- Hemogram, LFT, RFT, BSL, Uric acid, Urine RE/ME, C/S
- Ophthalmoscopic examinations
- USG lower abdomen & pelvis
- Doppler study
- Placental analyses
- Macroscopically using paraffin blocks.
- Microscopically using hematoxylin and eosin stain under a binocular light microscope.

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

Result and Discussion

The purpose of present research was focused in grossly examination in the normotensive and hypertensive pregnancies on Indian population. Purpose of the current study data was treated in descriptive analyses, chi-square test and Fisher exact test. Finding of the result was mentioned below-

Table 1: Distribution of cases according to gestational age

Gestational Age	Normotensive	Hypertensive	Total
164-224 days	12	20	32
Row %	37.50%	62.50%	
225-252 days	17	27	44
Row %	38.64%	61.36%	
253-294 days	71	53	124
Row %	57.26%	42.74%	
Total	100	100	200

Chi-square test p-value is 0.032

A Number of preterm delivered cases belonged to the hypertensive group with p-value 0.032 which is significant.

Table 2: Gravid status of the case

Gravid	Normotensive	Hypertensive	Total
Multi	68	52	120
Row %	56.67%	43.33%	
Primi	32	48	80
Row %	40.0%	60.0%	
Total	100	100	200

Fisher's exact test 2-tailed p-value 0.030

Table 3: Distribution of urine albumin

Urine Albumin	Present	Absent	Total
Hypertensive	39	61	100
Row %	39.00%	61.00%	
Normotensive	0	100	100
Row %	0.00%	100.00%	
Total	39	161	200

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

61.00% hypertensive patients showed positive results for urine albumin with p-value < 0.001, which is highly significant.

Hypertensive disorder during pregnancy is one of the leading causes of maternal mortality and morbidity and perinatal mortality and morbidity. The etio-pathogenesis of hypertensive disorders of pregnancy still remains a subject of controversy. In the earlier studies of the effect of maternal disease on the placenta gross abnormalities of the placenta have received undue attention and undeserved status. Das et al, (1996) studied that the morphological changes of the placenta in hypertensive disorders of pregnancy. They concluded that the placental changes directly proportion to the duration of the disease process and its severity and fetal outcomes are adversely influenced pathological changes in the placenta.

Nobis and Das (1991) studied that the placenta in normal and hypertensive pregnancies in relation to its weight and other morphological variations. Kaizad, et al (1989) studied that 60 placenta of toxemia pregnancy and 20 placentas were normal cases analyzing in histo-pathologically, finding of the result and they concluded that placenta pathology worsens with a progressive increase in hypertension. Malik, et al (1989), studied that the placenta in IUGR, finding of the result no specific lesion in placental histology find in toxemia of pregnancy. The only significant finding is the decrease of the size and weight of placenta in IUGR group. 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. Fox (1968) suggested that the placental pathology is quantitative rather than qualitative. Benirschke (2000) and Fox (1975) investigated the significance of placental findings only when these had a bearing on the fetal outcome. Das et al,(1996)studied the morphological changes of the placenta in the 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 are adversely influenced by pathological changes in the placenta. Nobis & Das (1991) findings of the study of the placenta in hypertensive pregnancies were shown to be deviation on weight and other morphological. Kaized (1989) studied that the 60 placenta of toxemia of pregnancy and 20 normal cases in histopathological, the study was concluded that placental pathology and morphologically worsens with the progression of hypertensive. A similar study was find the reduction in the fetoplacental weight ratio in the hypertensive group (Das, 1996; Kher & Zavar, 1981). Das (1996) 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. A similar finding was noted by Das (1996). Fox (1978) and Mohan et al (1989) reported that the higher incidence of retroplacental hematoma in pre-eclampsia. Das (1996) found a little higher incidence of the calcification in hypertensive group. Mohan et al (1989) found the frequency of calcification in higher in the hypertensive group.

Normally a placenta weights from 400 to 800gms. The present study finds the reduction of placental weight in the hypertensive disorder. The similar result finds in some studies Das, et al (1996), Sharma (1981), Dutta (1989) and Das (1991). Diameter and thickness were both reduced in the hypertensive group. Similar studies Das, et al (1996) was found diameter and thickness were reduced in hypertensive group.

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.

Conflict of Interest: None

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