Original Research Article

Morphology and morphometry of placenta in normotensives and hypertensives

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Abstract

Background: The human placenta is a discoid choriodeciduate organ, which connects the fetus with the uterine wall of mother. Researchers suggest that placental surface area is significantly less in PIH, but none have mentioned the exact surface area. **Objective:** The aim of the study was is to assess and compare the placental parameters in normal and hypertensive cases. **Materials and methods:** 200 placentae were examined in the study. It was carried out at BRIMS Medical College, Bidar.100 cases with pregnancy-induced hypertension and 100 normal pregnancies were selected for the study. The present study included women in the age group 18-35 years. Morphological and morphometical parameters were assessed by using standard methods. **Results:** Round shape placenta was seen in most of the eclamptic cases whereas oval shaped placenta was seen in preeclamptic cases. Most common placental insertion was central followed by eccentric. **Conclusion:** Placental examination is important in evaluating perinatal clinical conditions. One should carefully examine and recognize the placental abnormalities that contribute to adverse perinatal outcome. Careful examination of placenta can help in the diagnoses of various clinical conditions, their timely management and prevent the life threatening complications.

Key Word: Hypertention, Pre eclampsia, Eclampsia, Placenta.

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INTRODUCTION

The placenta is a specialized structure as it is made up of partly from the fetal tissue and partly from the maternal tissues. It performs several important functions like transportation of the nutrients and removal of waste products. The human placenta is a discoid choriodeciduate organ, which connects the fetus with the uterine wall of mother. The diameter of placenta varies between 15-20cm and thickness 3cm.[1] The weight of the placenta is about 500gms[2,3] Observation of the placenta gives perfect information about the fetal status. Placental observation provides insight of fetal development as the key connection between mother and fetus is placenta. As most of the fetal functions based on the functions of placenta, the information provided by placental observation is more observation. It undergoes different changes in structure and functions continuously throughout the gestation to support the prenatal life.[4] The careful examination of the placenta can be useful in the management of complications in mother and the newborn, utilizing the provided information. The hypertensive disorders are responsible for 5-8% of all maternal deaths[1] Pregnancy complications like hypertension or gestational diabetes are reflected macroscopically and microscopically in the placenta.[5] The surface area of placenta was reported to be decreased in PIH, but none have mentioned the exact surface area.[6] Therefore it is pertinent to undertake present study to evaluate placental parameters in normal and hypertensive cases and prevent complications in mother and the child.

MATERIALS AND METHODS

Participants: 200 placentae were examined in the study. It was carried out at BRIMS Medical College, Bidar. 100

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cases with PIH and 100 normal pregnancies were included. The age group of the participants was18-35 years. The data(gestational age, history of any past illness, investigations) had been collected from the case sheets of the normal and PIH patients, admitted in Obstetrics and Gynaecology Department of BRIMS training hospital in Bidar district of North Karnataka during the period from December 2014 to July 2016.Consent of the mother was taken to use placenta and her case details for the study as per the proforma. The inclusion criteria was control group of pregnant women with normal blood pressure levels**.** Hypertensive pregnant women having either pre-eclampsia i.e. BP>140/90, after 20 weeks of gestation with either proteinuria or edema or eclampsia defined as condition with the presence of seizure activity in patients of pre-eclampsia. Exclusion criteria were essential hypertension, renal disorders, diabetes mellitus, cardiac disease and rhesus incompatibility.

MATERIALS

The placentae of the cases and controls were the material for the present study. The other materials used were measuring tape**,** gloves**,** apron**,** weighing machine (manual)**,** scalpel with blade**,** scissor**,** dissection trays**,** case sheets of the mother. Maternal details, blood pressure, other clinical findings and investigations were recorded from the clinical case sheets. Soon after the delivery the cord was clamped and the placenta with attached membranes was taken and was washed thoroughly, labelled and was studied for morphological parameters i.e., shape of placenta whether 0val, 0ound, triangular, quadrilateral, kidney or horse shoe shaped, bilobed, cord insertion- central, eccentric, battledore, velamentous**,** number of cotyledons (maternal surface) and maternal surface- complete or incomplete, presence of normal fissures. morphometry.

Ethical consideration: The studyprotocol was approved by institutional human ethical committee. Consent of the mother was taken to use placenta and her case details for the study as per the proforma.

Data analysis: Statistical analysis was done using "unpaired t – test". P value less than 0.05 was considered significant.

RESULTS

The placentae from eclampsia weighed <500gms, the least weight recorded being 250 gms where as 94% of the placentae of pre eclampsia weighed <500 where the least recorded weight was 350 gms. 73% of the placentae from the normal pregnancies weighed > 500 gms and the highest recorded weight being 510gms. The mean placental weight in the control group was 475.56± 28.73 and that of pre eclampsia and eclampsia is found to be 416.80 ± 44.64 and 385 ± 20.85 respectively. Thus the values are significant statistically. Round shape placenta was seen in most of the eclamptic cases whereas oval shaped placenta seen in pre eclamptic cases. Most common placental insertion was central followed by eccentric. Incidence of bilobed placenta was found to be 3% in pre eclampsia whereas there was no bilobed placenta found in normal and eclamptic placentae. The average length of the placenta in control and cases (pre-eclampsia and eclampsia) was 18± 2.22, 17.40 ±1.97 and 16.30± 2.82 respectively. The average width of the placenta in the control and cases (pre-eclampsia and eclampsia) was 15.7± 1.32, 15.06 ± 1.22 and 15.52 ± 1.04 respectively. The mean placental thickness at the center in the control and cases (pre-eclampsia and eclampsia) was 2.73 ±0.37, 2.45 ± 0.34 and 2.50 ± 0.37 respectively. The values are significant statistically. The average number of cotyledons range from 18 to 23 in all. The average number of cotyledons in the control group was 19.85 ±1.47 and that in the pre eclampsia and eclampsia were found to be 19.68 ± 1.43 and 19.56 ± 1.04 respectively.

DISCUSSION

The observations made on the weight of the placenta in the present study correlates with the studies done by Raghunath G(2011)[7], Sankar KD (2013)[2] and Kulandaivelu RA (2014)[8] respectively where the weight of the placenta was found significantly less in the hypertensive cases. In the present study, the average weight of the placenta in Normotensive cases was 475.56 gms whereas 400.90 in PIH patients with lowest weight of 250gm. The mean placental weight in eclampsia with a p value of <0.001 was significant statistically. Similarly mean placental weight in pre eclampsia with a p value of <0.001 was also significant statistically. The cause of reduction in blood flow may be due to vasculopathies of the spiral arteries which in turn causes reduction in weight of placenta.[9] The present study shows that the majority of placenta were oval, incidence of bilobedplacenta was found to be 1%. 39% of eclampticplacentae, 70% of pre eclampticplacentae and 59% of normal placentae were found oval in shape. According to a study conducted by Nobis and Das (1980),[10] the percentage of round shaped placenta was found more than the percentage of oval shaped and bilobed placenta but in the present study the percentage of oval shaped placenta was comparatively more than the round shaped. The percentage of bilobed placenta was minimal. The mean placental diameter was found to be 17.31cm. In the present study, the average dimensions in normal placenta was18 x 15.7cm whereas that in the eclampsia and pre eclampsia were 16.30 x 15.52 cm and

17.40 x 15.06 cm respectively. These values were not significant statistically. Majority of the cases showed central insertion of umbilical cord. The next commonest found insertion was eccentric. No other mode of insertions (viz. velamentous) was found. 87% of eclampticplacentae, 73% of pre eclampticplacentae and 80% of normal placentae had central insertion of the umbilical cord. Thus the most frequent found insertion of umbilical cord in the present study was central. Previous studies done by Nobis *et al.*,[10], Rath *et al.*,[11], Narasimha A and Vasudeva[12] also found central insertion of umbilical cord as the most commonest mode of insertion of umbilical cord. The authors Kishwara S *et al.*, (2009)[13] and Saeed I *et al.*,(2011)[14] found that the number of cotyledons on the maternal surface of the placenta in the normotensive women was comparatively more than the hypertensive women. The present study showed no significant difference. Pregnancy Induced Hypertention is one of the leading causes of maternal morbidity and mortality and an emerging cause of fetal wastage. Its incidence is high in the developing countries because of malnutrition and poor obstetric facilities.

CONCLUSION

Placental examination is important in evaluating perinatal clinical conditions. One should carefully examine and recognize the placental abnormalities that contribute to adverse perinatal outcome. Careful examination of placenta can help in the diagnoses of various clinical conditions, their timely management and prevent the life threatening complications.

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