

Morphometric study of placenta in cases of pregnancy induced hypertension and normal pregnancy

Kailash Balkund^{1*}, Uddhav Mane², Vijay Nayak³, Mahesh Taru⁴

¹Assistant Professor, ⁴Associate Professor, Department of Anatomy, Malabar Medical College, Calicut, Kerala, INDIA.

²Assistant Professor, Department of Anatomy, Dr. S. C. Govt. Medical College Nanded, Maharashtra, INDIA.

³Assistant Professor, Department of Anatomy, Chirayu Medical College, Bhopal, Madhya Pradesh, INDIA.

Email: dr_kailashbalkund@rediffmail.com

Abstract

Introduction: Placenta is a vital organ contributed by two different individuals (mother and foetus) having different genetic constitution. After delivery, proper examination of placenta provides status of foetus in womb and also various complications of pregnancy are reflected on placenta. Pregnancy complicated by hypertension is commonly associated with placental insufficiency, there by resulting in foetal growth retardation. Again reduced utero-placental blood flow has been recognized in cases of severe preeclampsia with hypertension. So the present study is carried out on 100 placentae from mothers with pregnancy induced hypertension and 101 placentae from mothers without any materno-foetal complication (normal placentae). In present study, percentage of retroplacental hematoma increases in placentae from pregnancy induced hypertension group as compared to normal group. The number of cotyledons on placentae in normal group is more than pregnancy induced hypertension group. It is found that thickness of placentae in pregnancy induced hypertension is significantly lesser than thickness of normal placentae. Placental circumference is significantly less in pregnancy induced hypertension as compare to the normal group. Results of this study indicate that in pregnancy induced hypertension insertion of umbilical cord is more lateral as compare to normal.

Keywords: Pregnancy induced hypertension, retroplacental hematoma, cotyledons, calcification, morphometric changes in placenta, preeclampsia, insertion percentage,

*Address for Correspondence:

Dr. Kailash Balkund, Assistant Professor, Malabar Medical College, Calicut, Kerala, INDIA.

Email: dr_kailashbalkund@rediffmail.com

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INTRODUCTION

Placenta is a vital organ contributed by two different individuals (mother and foetus) having different genetic constitution. It is a physiological, temporary unique graft which is channel of nourishment from mother to foetus. After delivery, proper examination of placenta provides status of foetus in womb and also various complications

of pregnancy are reflected on placenta. Placenta is a mirror which reflects the intrauterine status of the foetus (Udainia A, Bhagwat s. 2001). Examination of the placenta can yield information that may be important in the immediate and later management of mother and infant. Pregnancy induced hypertension is one of the threatening problems and complications arising from it are also common which lead to several maternal and foetal deaths. During pregnancy, examination of mother and foetus done properly but what is overlooked is placenta, as it cannot be measured directly until after birth. Pregnancy complicated by hypertension is commonly associated with placental insufficiency, there by resulting in foetal growth retardation. Again reduced utero-placental blood flow has been recognized in cases of severe preeclampsia with hypertension. In previous studies it has been revealed that there is clear relationship between pregnancy induced hypertension and morphometric changes in placenta and which ultimately

reflects foeto-maternal status. So the present study is carried out on placentae from mothers with pregnancy induced hypertension and placentae from mothers without any materno-foetal complication (normal placentae). Different morphological parameters are used for this purpose. The findings are statistically analysed and compared with those of normal placentae.

MATERIAL AND METHODS

This is the prospective study carried out in department of Anatomy. Total 201 placentae were studied. These comprised of 101 placentae from control group of healthy mothers and 100 placentae from maternal disorder i.e. pregnancy induced hypertension. Cases selected are those patients who were having blood pressure 140/90mmHg or more with or without oedema/proteinuria. None of these cases had hypertension prior to pregnancy. In control group, pregnancies with normal blood pressure and without oedema/proteinuria were included. Only placentae from 36 to 40 weeks of pregnancy were included in this study. Only cases with live births were included. The placentae were examined carefully for different parameters i.e. Completeness of placentae, Shape of placentae, Calcification, Retro placental

hematoma, Site of attachment of umbilical cord to placentae, Thickness of placentae, Number of cotyledon, Circumference of placentae, Minimum distance of attachment of umbilical cord, Number of blood vessel in umbilical cord.

OBSERVATION AND RESULTS

In normal group 27.7% placentae are showing calcification while in PIH group 34% placentae are showing calcification, the difference is statistically insignificant. Retro-placental hematoma is more in cases of PIH (19%) than the normal (2%), findings are highly significant. The Number of cotyledons on placentae in normal group are more than PIH group. Mean thickness of placentae in PIH (22.8mm) is significantly lesser than the mean thickness of normal (31.7mm). The mean circumference in PIH group (411.9mm) is lesser than the normal group (451.1mm). The finding is statistically significant. The minimum distance of insertion of umbilical cord on surface of placenta in normal cases (43.9mm) is more than PIH cases (35.5mm). The difference in the means is statistically highly significant. Two arteries and one vein observed in umbilical cord of all placentae.



Figure 1: Showing measurement of minimum distance of cord Insertion from margin of placenta



Figure 2: Placenta from pregnancy induced hypertension showing retroplacental haematoma

DISCUSSION

In the present study, 34 (34%) placentae from pregnancy induced hypertension group are showing calcification. Mr. D. K. Dutta and Mrs B. Dutta found 26 (48%) placentae from pregnancy induced hypertension group out of 59 cases studied. While H. Fox (1963) studied 92 cases out of that 6 (6.6%) placentae showing calcification, and he observed that the incidence of calcification is lesser in pregnancy induced hypertension than normal group. He explained that he included cases who deliver before 38 weeks of pregnancy and because of this the incidence of calcification in pregnancy induced hypertension group is lesser than the normal. Incidence of retroplacental haematoma in pregnancy induced hypertension group is (19%) higher than the normal group (2%). Data from Ernest W. Page (1972) observed 0.8 % retroplacental haematoma in normal group, while

6.2 % in preeclampsia group. In the study done by Majumdar S *et al.* observed mean number of cotyledons per placenta is 17+2 in control group and 16+2 in hypertensive they found lower value in hypertensive group but statistically not significant. We also observed lower value in pregnancy induced hypertension (17.12) than normal group (18.54) Even though our value is statistically significant it is not clinically that much significant. In the present study it is observed that the mean thickness of placentae in pregnancy induced hypertension (22.83mm) is significantly lesser than the thickness of normal placentae (31.7mm). The present study suggests that the mean placental circumference in cases of placenta with pregnancy induced hypertension is significantly lower than the mean placental circumference observed in placentae of normal group. In present study in all the 201 cases, there were two umbilical arteries and

one umbilical vein. R. Sinan Karadeniz *et al.* (2001) studied 259 placentae and umbilical cord, in most of the cases, there were two umbilical arteries and one umbilical vein. In two cases (0.8%), the artery was single. Geoffrey Altshuler, A James Mcadams (1972) found 0.5% incidence of single umbilical artery in 2,215 consecutively examined placentas. As the sample size is less in this study (201) the incidence of single umbilical artery could not be predicted.

CONCLUSION

Considering the findings in the present study and correlating them with the findings of previous workers, it is concluded that the difference in percentage of calcification in pregnancy induced hypertension and normal group is not significant. Percentage of retroplacental haematoma increases in placentae from pregnancy induced hypertension group as compared to normal group. The number of cotyledons on placentae in normal group is more than pregnancy induced hypertension group. It is found that thickness of placentae in pregnancy induced hypertension is significantly lesser than thickness of normal placentae. Placental circumference is significantly less in pregnancy induced hypertension as compare to the normal group. Minimum distance of insertion of umbilical cord on surface of placenta is significantly less in pregnancy induced hypertension group as compare to normal, this indicates that in pregnancy induced hypertension insertion of umbilical cord is more lateral as compare to normal. Hypertensive disorders affects perinatal outcome, morphological placental changes produced by these disorders can be measured early by ultrasonography like techniques. This will be helpful to manage such high risk pregnancies.

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