

Placental morphological changes in hypertensive pregnancies – A comparison with normotensive pregnant female

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Abstract

Background: The present study was planned with an aim to compare the morphological changes seen in placenta of hypertensive mothers from the normotensive mothers to reduce the risk of perinatal mortality by early detection of placental morphological changes.

Methods: Total of 100 pregnant female patients with hypertensive disorder with gestational age of 20-40 weeks and singleton pregnancy were enrolled as cases in this study. Total of 200 matched normotensive pregnant female patients were enrolled as control group. Placental changes in hypertensive pregnant females were assessed and compared with normotensive pregnant females by ultrasonography. Data was compared using independent sample's 't'-test and Chi-square tes

Results: In present study, among different morphological features, we found placental infarction to be present in 6.00% of hyper tensive cases as compared to 1.5% normotensive cases, calcification in 62.00% of

hypertensive cases as compared to 47.00% of normotensive cases and hematoma in 11.00% of hypertensive group as compared to 1.5% of the normotensive group

Conclusion: The findings of the present study thus suggest that placental morphology is affected in hypertensive pregnancies which might be the reason for placental insufficiency in these cases. Therefore all pregnant females with these placental morphological changes in ultrasound should be evaluated for hypertension to reduce the maternal and prenatal morbidity and mortality.

Keywords: Normo tensive, hyper tensive, infarction, calcification, hematoma.

Introduction

Globally, nearly 10% of all pregnancies are complicated by hypertension and is responsible for a huge burden of maternal as well as prenatal morbidity and mortality.¹⁻³

Among pregnancies complicated by hypertension a number of structural, morphological and vascular changes take place in placenta during pregnancy. Hypertension in pregnancy can be the cause of vascular damage, insulin resistance and enhanced systemic inflammation in the placenta because oxygen supply and nutrient transfer is impaired in hypertension and oxidative stress is generated which affects the growth and development of placenta. Due to placental insufficiency a variable growth pattern is seen in hypertensive pregnancies.⁴⁻⁶ Present study was done to investigate the morphological changes in placenta in hypertensive pregnancy. Keeping in view the fact that placental changes and variations have an important impact on fetal wellbeing and pregnancy outcome and these changes are affected by the hypertensive status of the pregnant woman, hence it is important to study as to how and to what extent the hypertensive status affects the placenta morphologically, and in turn how do these changes affect the maternal and fetal outcomes.

Material and methods

Study area: Department of Radiodiagnosis SMS medical college and attached hospital Jaipur in Zenana hospital.

Study type: Comparative study

Study design: Observational cross section study

Sample size: A total sample of 100 hypertensive pregnant female was included in study and 200 normotensive pregnant female for control was included from the antenatal OPD who fulfilled inclusion criteria and give the informed written consent.

Study population: Hypertensive pregnant female and normotensive female in singleton pregnancies of 20-40 wks of gestation.

Inclusion criteria

1. Hypertensive pregnant female and normotensive pregnant female of 20-40 wks of gestation.

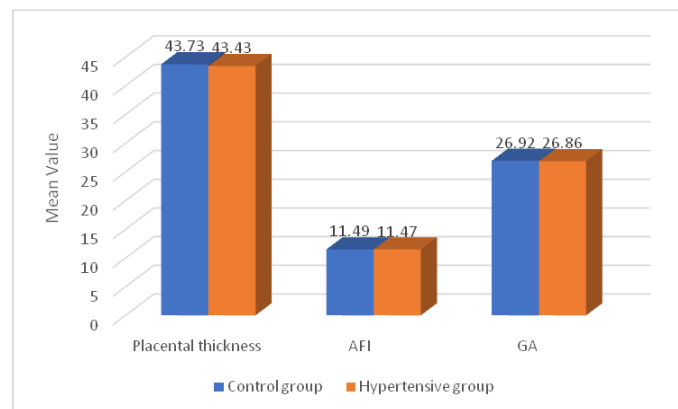
Exclusion criteria

1. Women with diabetes mellitus, hypothyroidism, abruptio placentae, jaundice or intrauterine infection (TORCH positive) were excluded from the study.
2. ABO & RH incompatibility pregnant females.
3. History of smoking or drug abuse.
4. Multiple pregnancies.

Results

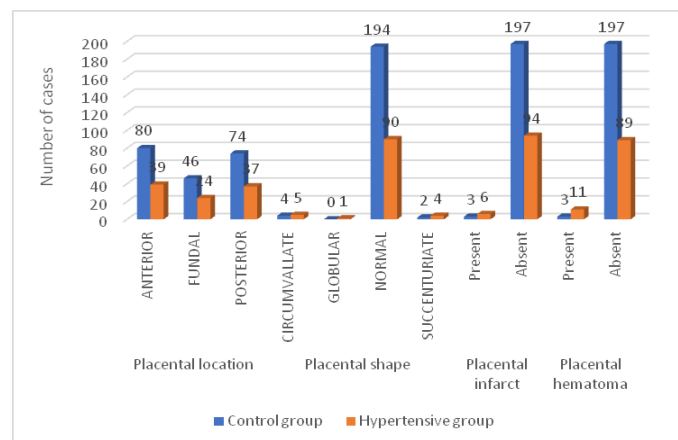
In present study, among different morphological features, we found placental infarction in 6.00% of hypertensive cases as compared to 1.5% nor Zmotensive cases, calcification in 62.00% of hyper tensive cases as compared to 47.00% of normotensive cases and hematoma in 11.00% of hyper tensive cases as compared to 1.5% of the normotensive cases.

Graph 1:



Comparison of placental thickness, AFI and GA in hypertensive and normotensive groups.

Graph 2:



Comparison of placental morphological parameters in hypertensive and normotensive groups

Discussion

The placental thickness in normotensive pregnancy was 43.73 ± 10.34 cm and hypertensive pregnancy was 43.43 ± 10.34 cm. The differences between both groups found statically insignificant.

Sibai B et al ⁷ found that in gestational hypertension, 62.50% have a thickness in the range of 1.9 to 2.1 cm; in preeclampsia it is 1.6 to 1.8 cm in 68.96% and that in eclampsia is less than 1.5 cm in 80.00% cases and no case had thickness above 1.8 cm in this group. Thus, analysis reveals that the thickness of placenta in hypertensive group gradually decreases.

Adair and Thelander et al ⁸ mentioned that the average thickness of toxæmic placenta was 1.15 cm which is almost similar to the present finding. He also mentioned that the thickest placenta seen in toxæmia of pregnancy had a dimension of 2.38 cm.

Sharma J. D. ⁹ who worked on placenta on the basis of maturity of pregnancy found the thickness in normal term pregnancy to range between 1.8 to 2.5 cm in most of the cases.

In present study, among different morphological features, we found placental infarction in 6.00% of hypertensive cases as compared to 1.5% normotensive cases, calcification in 62.00% of hypertensive cases as compared to 47.00% of normotensive cases and hematoma in 11.00% of hypertensive cases as compared to 1.5% of the normotensive cases. With respect to placental infarction and hematoma, the differences between two groups were statistically significant. Akhlaq et al also found proportion of cases with infarct to be higher in hypertensive group (28%) as compared to normotensive group (20%) similar to our study.¹⁰ The incidence of infarcts in their study was subclassified as

red infarcts, white infarcts, jelly infarcts and membrane infarcts and for each of these types the proportion was significantly higher in cases as compared to controls. In present study we found that infarction was in general significantly higher in hypertensive group as compared to normotensive group.

Motwani et al in their study also found incidence of calcification (70% vs 26.66%) and infarction (43.33% vs 3.3%) to be higher in hypertensive as compared to normotensive groups.¹¹

Singh and Gugapriya, similar to present study found incidence of infarction (58% vs 12%), hematoma (48% vs 8%) and calcification (44% vs 14%) and found the difference to be statistically significant for all the three parameters.¹² In our study, we did not find higher incidences of any parameters except for calcification compared to their study. Yet we were able to find statistically significant difference between study and control group for placental infarction and hematoma respectively.

Conclusion

The findings of the present study thus suggest that placental morphology is affected in hypertensive pregnancies which might be the reason for placental insufficiency in these cases. Therefore all pregnant females with these placental morphological changes in ultrasound should be evaluated for hypertension to reduce the maternal and prenatal morbidity and mortality.

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