

morphological changes of placenta which in turn influences the fetal outcome. Our aim is to study the differences in placental histopathology in different grades of pre eclampsia and eclampsia. 100 pre eclampsia and eclampsia patients underwent ultrasonographic evaluation of placenta and after delivery the placenta of these patients were sent for histomorphological examination. This study gives a better understanding of the placental role in the pathology of pre eclampsia and significantly influence the patient management. Placental study by USG and histomorphology in pre eclampsia and eclampsia pregnancies and correlating them with the fetal outcome helps us to understand the fetal morbidity and mortality seen in this condition. This study may open avenues for future research.

# **KEYWORDS**

**NBSTRACT** 

placenta, histopathology, pre eclampsia, fetal outcome

# INTRODUCTION

Placenta is a wonder organ, as it gives the most accurate record of infant's prenatal experience. Pre eclampsia is a systemic disorder which affects 5 - 7 % of women worldwide and is a major cause of maternal and neonatal morbidity and mortality. Pre eclampsia is accompanied by gross pathological changes in placenta and has adverse perinatal outcome. Thus the present study aims to correlate the placental Ultrasound and histomorphology with fetal outcome in preeclampsia and eclampsia patients.

# AIM OF THE STUDY

- 1. To Study the differences in ultrasound features and placental histopathology in preeclampsia and eclampsia.
- To attempt correlating fetal outcome to ultrasound features and histopathological findings of placenta in preeclampsia and eclampsia.

**STUDY DESIGN** : Prospective study

**PLACE OF STUDY:** Institute of obstetrics and gynecology, Chennai.

**STUDY PERIOD** : From august 2013 to October 2013

# MATERIALS AND METHODS

100 pregnant women with preeclampsia and eclampsia underwent ultrasonographic examination of placenta and after delivery gross examination of the placenta was done and then sent for HPE.

# METHOD OF STUDY

Patients were classified in 3 groups

- 1. Mild preeclampsia
- 2. Severe preeclampsia
- 3. Eclampsia

Ultrasound Examination of placental location, thickness and grading was done. After delivery each placenta was washed with tap water and blood squeezed out and then weighed and examined. Any gross abnormality of size, shape and site of Cord insertion noted. .Placenta was preserved in 10% of formalin and sent for HPE. At least 100 villi are studied for Syncytial knot, cytotrophoblastic proliferation, fibrinoid necrosis, stromal fibrosis, thickening of basement membrane and calcification .Fetus was observed for IUGR, FPR, Apgar score and early neonatal death.

#### **Statistical Analysis:**

Statistical analysis was performed using SPSS 17.5 version. Correlation of fetal outcome with ultrasound features, morphology of histopathology of placenta was studied using Chi Square test.

#### **OBSERVATION AND RESULTS**

It was observed that most of the placentas collected were from severe pre eclampsia patients corresponding 51 women.

# TABLE 1: INSERTION OF PLACENTA

Insertion	Mild preeclampsia	Severe preeclampsia	Eclampsia
Central	55.4%	43.1%	1.5%
Marginal	5.7%	65.7%	28.6%

Chi Square value shows that 32.170 and so the P value is 0.001(P < 0.05) so there is a statistical significance in between insertion and severity of the pre eclampsia (table 1).







**BAR CHART-2 Placental Thickness in IUGR** 

Feto placental ratio offers another measure to access placental size. If found outside the normal range, it warrants histological examination. In our study we found statistically significant correlation (Bar Chart- 1). In our study mean placental thickness was 2.99, well below normal range than that of the general population. Placental thickness had statistically significant association with IUGR(p = 0.025) and Early neonatal death(p=0.39), but it didnot relate to low apgar score (Bar Chart 2)(5).Placenta grading was found to be associated with the severity of the disease (P = 0.002) but had no statistical significance to neonatal outcome.



# **BAR CHART-3 Placental Infarction in IUGR**

Placental calcification has statistical significance only in relation to severity of the disease with P= 0.002.1t has no significant correlation with neonatal outcome (2). True knot had no significant correlation with neonatal outcome Placental infarction had significant association only with severity of disease, duration of disease and IUGR (Bar Chart 3). P value for disease severity is .001, and for gestational age and IUGR p value are 0.001 and 0.005 .We found that Syncytial knot had high statistically significant correlation only with the severity of the disease

(P = 0.001) and IUGR (P= 0.001). In our study cytotrophoblastic proliferation did not correlate with foetal outcome. It correlated statistically with severity of the disease with p 0 .001.All cases of eclampsia had this pathological feature (1, 4). Placenta from eclampsia and severe pre eclampsia and those who had longer duration of disease had higher grades of fibrinoid necrosis (fig 1), P =0.001( ststistically significant). It had postive correlation only with low apgar and early neonatal death with p values of 0.029 and 0.001 respectively. Basement membrane thickening is said to occur as a result of placental ischemia. Basement membrane thickening is normally seen in 2 % of villi, it is significant only when found in > 2% of villi. Basement membrane thickening had good association with severity of disease and neonatal outcome. There is positve association between disease severity and gestational age (P= 0.001 and 0.008) and also with IUGR (0.020) and low apgar (0.018). Stromal fibrosis is a villous pathology which is seen when there is reduced uteroplacental flow and accelerated ageing process .We found that gestational age(p=0.011), disease severity(p=0.001) and IUGR(p=0.005) had statistically high significance to it. Calcification was not significantly associated with severity of disease or fetal outcome.

FIGURE A&B showing fibrinoid necrosis and basement membrane thickening

Fibrinoid necrosis



Basementmembrane thickening



# DISCUSSION

In our study most cases of IUGR and babies born with low APGAR had FPR below the mean (4.40 ) observed in the cohort .Our study correlated with Rath G Garg.K et al.(16) who observed that marginal attachment of placenta might be hampering equal distribution of blood flow in the placenta, thereby increasing the risk to the mother and foetus. Placental thickness was found to be below mean in most cases of IUGR (50 % as compared to 27.5 % of normal babies) and in low APGAR babies (27.1 % as compared to 12.5 %) and in all cases of early neonatal death. Similar results in relation to IUGR was observed by Gediminas Meejus (5) (2005) and Betty M.Mathai (7) (2013). Placental grading did not correlate with foetal outcome in our study as most patients in this study were more than 34 weeks of gestation and only early calcification before 28 weeks is linked to adverse foetal outcome as observed by Chen et al (8)(2005). We found that fibrosis and calcification did not affect neonatal outcome. Among IUGR 50.7 % had placental infarction whereas 21.2 % had no significant infarction. This finding is similar to that observed by Rafiq et al (9) (2013) and Andres R L et al (10) 1990. Infarction has statistically high significance with severity of the disease. The findings are comparable to that observed by Udainia et al (3) (2004) and Majumdar et al (1) (2005). Syncytial knot count over 30 % (> grade 2) is indicative of excessive placental aging due to insufficiency. Grade 3 syncytial knot is seen in 61.5 % of IUGR whereas it is seen only in 38. 5 % babies without IUGR. Grade 3 was found only in severe pre eclampsia and eclampsia group. These are consistent with previous studies by Kristina et al (11) (2009) and Sodhi et al (12) (1990). Cytotrophoblastic proliferation was significanty higher in severe pre eclampsia group as seen Majumdar et al (1) (2005) and masodkar et al (6) (1985). Fibrinoid necrosis was seen more often in severe pre eclampsia and it was significantly found in babies who had adverse foetal outcome .Similar findings is seen in studies by Heazella et al (5)(2007) and Rohini motwani et al (2) (2013). Basement membrane thickening is seen consistently in placenta of severe pre eclampsia patients and also in placenta of IUGR and low APGAR babies. Similar findings are observed by Abdul Hafeez Baloch et al (13) (2012) and Myatt .L et al (14) (2002). Among 42 placenta of IUGR babies 35 % placenta had stromal fibrosis and among 51 cases of severe pre eclampsia, 45 had this histological finding similar to observation made by Nasimha A et al (15) (2011).

# CONCLUSION

The study is a humble endeavor to assess the probable link of morphological and histopathological changes in placenta to fetal outcome and thereby pave way for better fetal outcome. Examination of placenta with warning signals for neonatal outcome revealed within few days, in a tertiary care hospital may alert the obstetrician as well as the neonatologist to keep such babies under careful monitoring in NICU. In our study, we had significant changes in placenta in pre eclampsia and eclampsia and its associated fetal outcome.

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