

PLACENTA IN NORMAL PREGNANCY VS. PLACENTA IN PREGNANCY IN INDUCED HYPERTENSION: A MORPHOLOGICAL AND HISTOPATHOLOGICAL STUDY

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ABSTRACT: Placenta is a discoid organ which is transient. Placenta is a vital organ which maintains pregnancy and thus ensures normal foetal development. It is sometimes described as the mirror of the perinatal period. Hypertensive disorders complicating pregnancy are common and form one of the deadly triad along with haemorrhage and infection, that results in large number of maternal deaths and there off foetal deaths. This leads to constriction of fetal stem arteries and has been associated with the changes seen in the placenta of pre eclamptic women. Maternal vasospasm leads to fetal hypoxia and accordingly it may lead to fetal distress and fetal death. This study was done to find out the morbid changes of the placenta of hypertensive mothers in comparison to normotensive mothers. The study was done in 150 placentas, which were collected from Obstetrics and Gynecology department. Out of the 150 placentas collected, 50 placentas were from uncomplicated full term deliveries and served as control group, 50 placentas were collected from mild PIH and other 50 were from severe PIH cases and served as study group. The size and weight of the placenta reduces in PIH and a whole plethora of histopathological findings can be encountered in PIH.

KEYWORDS: Placenta, Pregnancy in induced hypertension, Histopathology.

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INTRODUCTION: Placenta is a vital organ which maintains pregnancy and thus ensures normal foetal development. It is sometimes described as the mirror of the perinatal period. The placenta connects the fetus to the uterine wall, and is the organ by means of which the nutritive, respiratory, and excretory functions of the fetus are carried on. All the anabolites needed for foetal metabolism come from the mother's blood and foetal catabolites are passed back into the mother's circulation through the placenta.

Placenta is a discoid organ which is transient.¹ The organ maintains an accurate record of infant's prenatal growth.² The expelled placenta appears as a discoid mass which weighs about 450 gm and has a diameter ranging from 15 to 20 cm. Its average thickness is about 3 cm at the centre. The thickness diminishes rapidly toward the circumference of the disk, which is continuous with the membranes. Its maternal surface is divided by a series of fissures into lobules or cotyledons. The fetal surface of the placenta is smooth, being closely invested by the amnion. Seen through the latter, the chorion presents a mottled appearance, consisting of gray, purple, or yellowish areas. The umbilical cord is usually attached near the center of the placenta, but may be inserted anywhere between the center and the margin.

Hypertensive disorders complicating pregnancy are common and form one of the deadly triad along with haemorrhage and infection, that results in large number of maternal deaths and there off foetal deaths. Hypertensive disorders during pregnancy tend to cause changes in placental morphology and in turn the outcome of that pregnancy.

Pregnancy complications like hypertension are reflected in placenta in a significant way both macroscopically and microscopically. Several studies have shown that utero-placental blood flow is decreased in PIH due to maternal vasospasm.³ This leads to constriction of fetal stem arteries and has been associated with the changes seen in the placenta of preeclamptic women.⁴ Maternal vasospasm leads to fetal hypoxia and accordingly it may lead to fetal distress and fetal death.⁵ Present study has been undertaken to record the data on the morphology, morphometry, and histology of placenta from mothers with PIH and correlate the findings with the birth weight of the new born babies. This study was done to find out the morbid changes of the placenta of hypertensive mothers in comparison to normotensive mothers. As placenta is the mirror of maternal and fetal status, it reflects the changes due to maternal hypertension.

So study of morphometric and histopathological changes of placenta in pregnancy induced hypertension in comparison with the uncomplicated pregnancy gives a clear idea of adverse effects on clinical outcome that is foetal weight.

MATERIALS AND METHODS: The study was done in the Department of Pathology in collaboration with the

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The study was done in 150 placentas, which were collected from Obstetrics and Gynecology department. Out of the 150 placentas collected, 50 placentas were from uncomplicated full term deliveries and served as control group, 50 placentas were collected from mild PIH and other 50 were from severe PIH cases and served as study group.

The age of the women varied from 20 to 35 years. The cases were divided into three groups, namely, normal, mild and severe PIH groups.

All the cases of Pregnancy Induced Hypertension were divided into mild and severe categories depending upon the frequency and intensity of the abnormalities listed below;

The placenta with attached membranes and umbilical cord was collected soon after delivery, washed in running tap water, labeled, and then fixed with 10% formalin for 1-2 weeks. Gross and microscopic examination of the placenta was carried out. The size, weight, number of cotyledons, and site of insertion of umbilical cord were noted down.

Histopathological study of placenta was done after staining with H and E staining and sometimes special stains when required and were observed under light microscope.

RESULTS:

HISTOPATHOLOGICAL RESULTS: Study of placenta showed the following results.

Syncytial knots were seen in 36 percent of the mild PIH and increased to 72 percent in severe cases.

Fibroid necrosis and areas of calcification and hyalinization were observed 12 percent of the mild cases and 90 percent of the severe cases.

DISCUSSION: The weight and the size of the placenta decrease in PIH. The number of cotyledons also decreases. The umbilical cord attachment is not related in PIH though the common assumption was that in PIH it was affected. All these findings point out to the fact that the blood supply and along with that the nutrition will be compromised for the developing foetus.

The arrangement of intracotyledon vasculature is altered in hypertension resulting in low birth weight of the babies. Heavy proteinuria increases the incidence of low birth weight babies in preeclampsia. Also the reduction in the villous population will interfere with fetal nutrition and growth, leading to decrease in neonatal weight. The

hypertensive pregnancy leads to less number of cotyledons. Placental insufficiency is the cause of neonatal morbidity, which in turn might be the result of these observed alterations in placental weight.

Our study is in agreement with A Study on Morphology of Placenta in pregnancy Induced Hypertension in Kerala⁶ and Study of placental changes in pregnancy induced hypertension by Maimoona Ahmed, Rekha G. Daver.⁷

CONCLUSION: The development of the foetus depends on the health of the mother and PIH is one of the most important factors causing high of foetal mortality. The following study makes us understand the importance of placenta and its role in growth of a normal foetus. The morphological and histopathological changes help us to understand the underlying pathology. The size and weight of the placenta reduces in PIH and a whole plethora of histopathological findings can be encountered in PIH.

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Sl. No.	Indicators	Mild PIH	Severe PIH
1.	Diastolic blood pressure	<100 mm Hg	110 mm Hg or higher
2.	Proteinuria	Trace to 1 +	Persistent 2+ or more
3.	Convulsions	Absent	Present t (eclampsia)
4.	Oliguria	Absent	Present
5.	Serum Creatinine	Normal	Elevated
6.	Hyper bilirubinemia	Absent	Present

7.	Thrombocytopenia	Absent	Present
8.	Liver enzyme elevation	Minimal	Marked

Table 1: Indicators of Severity of Pregnancy Induced Hypertension

Group	201-300gm	301-400gm	401-500	500-600gm	600-700gm
Normal	1	6	31	9	3
Mild PIH	12	11	26	1	0
Severe PIH	20	26	4	0	0

Table 2: Frequency of the distribution of the weight of placenta

Group	Less than 15cms	More than 15 cms
Normal	17	33
Mild PIH	26	24
Severe PIH	41	09

Table 3: Frequency of the distribution of the size of placenta

Group	Mean Number of cotyledons
Normal	17.12
Mild PIH	14.42
Severe PIH	11.35

Table 4: Number of cotyledons



Fig. 1: Showing the foetal surface with umbilical cord attachment in PIH



Fig. 2: Image showing maternal surface

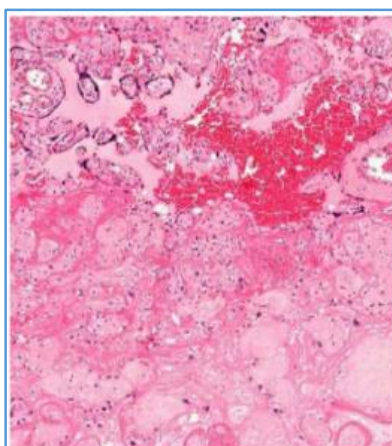


Fig. 3: Image showing H and E staining of a section of placenta. Lots of infarct can be appreciated

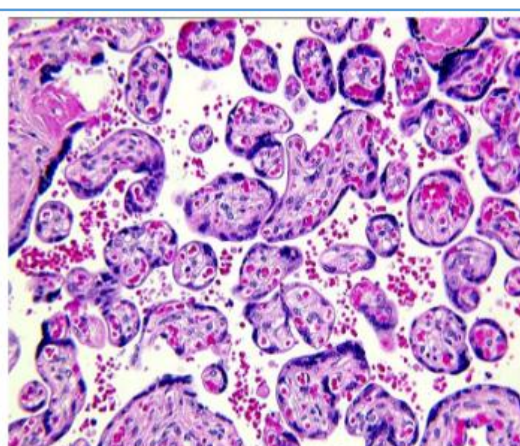


Fig. 4: showing extensive syncytial knots

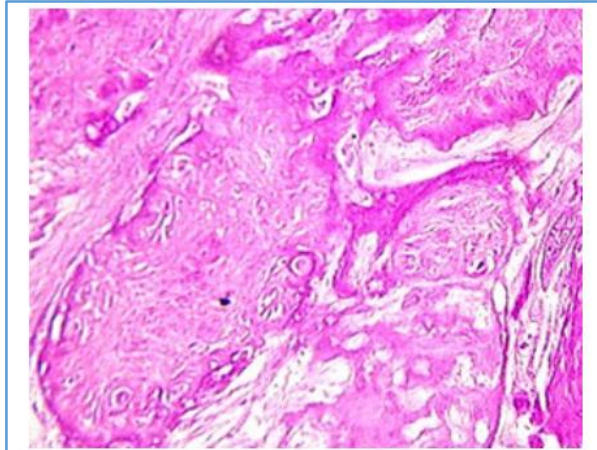


Fig. 5: Showing hyalinization and loss of fetal vessels