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Comparison of Villi in Pregnancy Induced Hypertensive and Normotensive Pregnancies.

Prabhjot Kaur[1], Sanjeev Sharma[2], Harsh[3], Subhash Kaushal[4]

[1]Associate Professor, Department of Anatomy, GMC, Mandi, HP.
[2]Assistant Professor, Department of Radiology, MMMCH, Kumarhatti, Solan.
[3]Assistant Professor, Department of Anatomy, MMMCH, Kumarhatti, Solan.
[4]Professor, Department of Anatomy, GMC, Patiala.

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ABSTRACT

Background: The placenta accomplishes the functions through its unique anatomical association with mother. Placenta links the mother and fetus by interaction with maternal blood via uteroplacental vessels. Attention towards the uterine side of the placenta might explain inexplicable pregnancy complications. By the study of placental bed new information has come to light, especially for Preeclampsia and intrauterine fetal growth retardation. Aims: To study changes in villi in pregnancy induced hypertensive and normotensive parturients. **Methods:** This study was conducted in the Department of Anatomy and Pathology, Government Medical College, Patiala. The placentae were collected from gynaecological operation theatre, Rajindra Hospital, Patiala. Seventy five cases of pregnancy induced hypertension and twenty five cases of normotensive pregnancies were taaken. An attempt was made to see any changes in histological features of villi in pregnancy induced hypertensive cases and compare it with the normotensive placentae. **Results & Conclusion:** The microscopic study showed avascular villi in PIH placentae as compared to normotensive placentae (control) which may be related to alterations in the uteroplacental flow.

Keywords: Placentae, Avascular Villi, PIH.

INTRODUCTION

The placenta provides a 'diary' of the pregnancy. The information provided from histopathological assessment of the placenta may provide important clinical information for both the mother and the neonate.

Not only may the etiology of the injury be ascertained from placental examination, but also a time frame during which the abnormal condition has been operating.[1] Preeclampsia is the most important complication of human pregnancy world wide and a major contributor to maternal and fetal morbidity and mortality.

In contrast to chorionic villi in the placenta during pregnancy, the chorionic epitheilium in the placenta at term is reduced to a thin layer of syncytiotrophoblasts. The connective tissue in the villi is differentiated with more fibres and fibroblasts, and it contains large, round macrophages (Hofbauer cells). The villi also contain mature blood cells in the fetal blood vessels, which have increased in complexity during pregnancy. The intervillous space is surrounded by maternal blood cells.[2]

The present study has been undertaken to correlate the status of villi in normotensive and pregnancy induced hypertensive cases.

Name & Address of Corresponding Author
Dr. Prabhjot Kaur
Associate Professor,
Department of Anatomy,
GMC, Mandi,
HP.

MATERIALS AND METHODS

Study was conducted in department of Anatomy and Pathology, GMC, Patiala during a period of January 1, 2008 to December 31, 2009. 100 placentae were collected from labour room and from gynaecological operation theatre, Rajindra Hospital, Patiala with patients conscent.This study was approved by institutional ehical committee. Cases were broadly divided into two groups :

1. Group I (Study/PIH group) – 75 cases of clinically proved PIH.
2. Group II (Control group) – 25 singleton normotensive pregnancies.

Cases with period of gestation more than 35 weeks were taken for study and cases that are previously

hypertensive were excluded from the study. The placentae were grouped depending on the degree of hypertension as described by cinningham et al.[3]

1. Normotensive < 140/90 mm Hg
2. Mild hypertension >140/90 - < 160110 mm Hg
3. Severe hypertension > 160/110 mm Hg

The placenta were received in adequqte amount of 10% formalin.

Selection of pieces from placenta was done in accordance with salafia and popek (1996), who recommended minimum sections from placenta for histopathology.[4]

1. Section from membrane roll, 2. From central area of fetal surface, 3. From central area of fetal surface, 4 & 5. From umbilical cord's two ends, leaving 3 cm of proximal end.

All the sections of placenta were stained with Haematoxylin and Eosin stain. Stained slides of thin section were prepared to examine under microscope. Microscopic changes in villi were noted.

Data was compiled in performa and statistically analysed. The main observations and interpretations were done according to Salfia and Popek[4].

RESULTS

In normal term placenta, chorionic villi are well vascularized. Table1 shows that avascular villi were seen in 53 (70.67%) cases of the study group [Figure 1 & 2] while avascular villi were not seen in any of the cases of the control group.

The statistical difference between two groups was highly significant.

Table 1: Avascular villi in study and control groups.

Avascular villi	Group I (Study)		Group II (Control)	
	No.	%age	No.	%age
Absent	22	29.33	25	100
Present	53	70.67	0	0
Total	75	100	25	100

Statistical Analysis

χ2	P value	Significance
37.6	< 0.0001	HS

Table 2: Comparision of Avascular villi in study and control groups with other studies.

Author (Year)	Group	%age of cases
Mehendale et al (1988)	PIH	72.22
	Control	0
Present Study (2009)	PIH	70.67
	Control	0

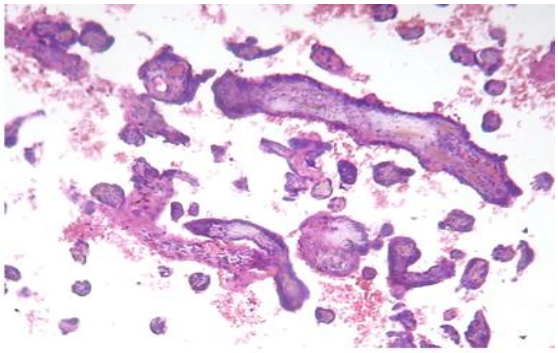

Figure 1: Microphotograph of placentae showing thin avascular villi. (H$E, 40X).

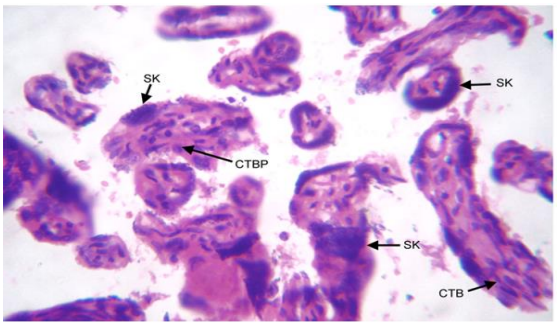

Figure 2: Microphotograph of placentae showing thin avascular villi having synctitial knot(SK) count > 30% and cytotrophoblast proliferation(CTBP).(H$E, 100X).

DISCUSSION

In this study, the emphasis has primarily been made on microscopic changes in placenta in PIH and normal cases and its relation with fetal outcome, which in future will be helpful in managimg pregnancies complicated with hypertension.

In the present study, avascular villi were present in 70.6% cases of study group while all the subjects of control group had normal vascularization in their villi [Table 1, Figure 1 & 2].

Mehendale et al also observed significant avascular villi in PIH cases [Table 2].[5]

Stoz et al reported smaller diameters of the vessels and a decrease of the degree of vascularization of villi in the gestosis (pre-eclampsia) group.[6]

LiC et al observed that fibrosis of villi in severe pregnancy-induced-hypertension group,[7] were significant when compared to normal term pregnancy.

Wang et al found significant decrease in villous vascular tissues in the placentae of patients with pregnancy-induced-hypertension complicated by intrauterine growth retardation than in normal women ($P < 0.05$).[8]

The avascular villi in PIH placentae are the result of senescent or regressive changes in villi due to ischemia and can also be seen in prolonged pregnancies.

CONCLUSION

The microscopic study showed avascular villi in PIH placentae as compared to normotensive placentae (control) which may be related to alterations in the uteroplacental flow.

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