Research Paper

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Morphological Study of Placenta in Pregnancy Induced Hypertension

Medical Science

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ABSTRACT

Background: Placenta is essential organ for foetus to survive. It connects the foetus to the uterine wall of mother. Placenta has role in circulation of nutrition, respiration and homeostasis. Intra-uterine growth of foetus depends mainly upon adequate function of the placenta. Placental function is in term, influenced by its anatomical structure. In present study efforts have been made to access effects of PIH on placenta and compare it with normal pregnancy.
Methods: In present study 100 placentae collected from Obst and Gync. Department, V. S. Hospital, Ahmedabad, during October 2009 to September 2011. Out of 100 cases 50 cases are of PIH and 50 cases are of normal pregnancy. Detailed history of each patient and examination of placenta was done. Each placenta was examined for weight, diameter, volume and thickness.
Results: In present study 50 cases of PIH was taken, out of which 20 cases show reduction in weight, 31 cases show reduction in volume, 22 cases show reduction in diameter and 34 cases show reduction in thickness of placenta, which was higher than normal pregnancy.

1. Introduction

Placenta is vital organ for survival of foetus. It connects the foetus to the uterine wall of mother. Placenta works as major organ for circulation of nutrition, respiration and homeostasis. Intra-uterine growth of foetus depends mainly upon adequate function of the placenta[1]. Placental function is in term, influenced by its anatomical structure. That is why study of morphology of placenta is considered essential.

Hypertension is one of the common complications associated with pregnancy. It affects 7-10% pregnancies throughout the world[2]. Hypertension in pregnancy is found to be associated with variable histomorphological changes in placenta, which show a clear reflection for the poor foetal outcome[3]. It is responsible for maternal or foetal morbidity and mortality. Foetal well-being is directly or indirectly related to placental circulation.

In present study, efforts have been made to access effects of pregnancy induced hypertension on placental anatomical structure.

2. Materials and Methods

Morphological study of 100 placentae from 100 pregnant women was done, Out of which 50 were normal pregnant women in Group – A and 50 were pregnant women with PIH in Group – B.

In Group – A pregnant women have B.P. less than 120/90 mmHg without proteinuria and oedema. In Group – B pregnant women have B.P. more than 140/90 mmHg for more than 2 occasion with or without proteinuria or oedema.

Detailed antenatal and intranatal history was taken. Routine examination was done. Routine investigations of all women were sent to pathology laboratory. Last USG finding were taken in to consideration. Delivery of all pregnant women enrolled for study, was attended.

Examination of placenta was done just after delivery of baby. Placenta is moped dry and clots are removed.

Various parameters measured by following method.

a) Weight:
By putting placenta directly over standardized weighing scale.

b) Volume:
By putting placenta in fully loaded bucket, that contain pre-measured amount of water. As placenta put inside the bucket, water falls out.

By measuring volume of water fall out, we can measure the volume of placenta.

c) Thickness:
Placenta is placed on flat surface. Two circles are drawn from the Centre of placenta. Thick point needle is inserted to full thickness of placenta at 5 points.

- Centre of inner circle.
- 2 different points between inner and outer circle.
- 2 different points outside the outer circle.

Mean of all 5 points are taken as thickness of placenta.

d) Diameter:
1st diameter – maximum diameter of placenta from its Centre.

2nd diameter – maximum diameter from right angle to previous plane.
Then taking, mean of two measurements.

3. Results

In present study 100 placentae collected and examined.

Table I: - Weight of Placenta

Weight(grams)	Group A		Group B	
	No.	Percentage	No.	Percentage
201-400	9	18%	20	40%
401-600	31	62%	27	54%
601-800	7	14%	3	6%
801-1000	9	18%	0	0

Average placental weight is 470gm. Out of 50 placentae from normal pregnancy, 9 (18%) have placental weight less than 400 gm. Out of 50 placentae from PIH cases, 20 (40%) have placental weight less than 400 gm. This indicates there is reduction in weight of placentae in PIH cases.

Table II: - Volume of Placenta

Volume (ml)	Group A		Group B	
	No.	Percentage	No.	Percentage
001-200	5	10%	6	12%
201-400	20	40%	25	50%
401-600	18	36%	10	20%
601-800	4	8%	9	18%
801-1000	3	6%	0	0

Average placental volume is 500 ml. Out of 50 placentae from normal pregnancy, 25 (50%) have placental volume less than 400 ml. out of 50 placentae from PIH cases, 31 (62%) have placental volume less than 400 ml.

Table III: - Thickness of Placenta

Thickness(cm)	Group A		Group B	
	No.	Percentage	No.	Percentage
0.1-1	4	8%	3	6%
1.1-2	20	40%	31	62%
2.1-3	11	22%	8	16%
3.1-4	10	20%	4	8%
4.1-5	5	10%	4	8%

Average placental thickness is 2.3 cm. Out of 50 placentae from normal pregnancy, 20 (40%) have placental thickness less than 2 cm. Out of 50 placentae from PIH cases, 31 (62%) have placental thickness less than 2 cm.

Table IV: - Diameter of Placenta

Thickness(cm)	Group A		Group B	
	No.	Percentage	No.	Percentage
14.0 – 16.0	4	8%	7	14%
16.1 – 18.0	10	20%	15	30%
18.1 – 20.0	24	48%	22	44%
20.1– 22.0	8	16%	6	12%
22.1 – 24.0	4	8%	0	0%

Average diameter of placenta is 18.5 cm. Out of 50 placentae from normal pregnancy, 14 (28%) belongs to placental diameter less than 18 cm. Out of 50 placentae from PIH cases, 22 (44%) belongs to placental diameter less than 18 cm.

4. Discussion

In developing_country, PIH rank 2nd to anaemia to complicate pregnancy.

In present study 100 placentae were taken. 50 placentae from normal pregnant women, forming Group – A and 50 placentae from pregnancy complicated with hypertension forming Group – B. An attempt was made to determine morphological changes in placentae in PIH cases.

Study of gediminas meeejus[4], shows mean placental weight in normal pregnancy 608gms and in PIH cases 425gms, study of Udaina et al[5]. shows mean placental weight in normal pregnancy 495gms and in PIH cases 403gms, study of Majumdar S et al[6]. shows mean placental weight in normal pregnancy 485gms and in PIH cases 399gms. In present mean placental weight in normal pregnancy 529.3 gms and in PIH cases 425.4 gms also reduction in placental weight in PIH cases.

Study of Majumdar S et al. shows mean placental volume in normal pregnancy 612.18ml while in PIH cases 375.99ml, study of Segupta Kishwara et al. shows mean placental volume in normal pregnancy 389.83ml while in PIH cases 292.80ml. In present study mean placental volume in normal pregnancy 422 ml while in PIH cases 389.2 ml.

Study of Segupta Kishwara et al[7]. shows mean placental thickness in normal pregnancy 27.7mm and in PIH cases 15.8mm. Study of gediminas meeejus shows mean placental thickness in normal pregnancy 15.9mm and in PIH cases 15.1mm. In present study placental thickness in normal pregnancy 28.8 mm and in PIH cases 20.1mm

Study of Segupta Kishwara et al., shows reduction in mean placental diameter in PIH cases, which is 16.08cm compare to 18.8cm in normal pregnancy. In present study there was also reduction in mean placental diameter in PIH cases, which was 18.01 cm compare to 19.02cm in normal pregnancy.

5. Conclusion

Placenta, being a foetal organ shares the same stress and strain, to which the foetus is exposed. Thus any disease process affecting the mother and foetus also has a great impact on placenta. Preeclampsia remains a common complication of pregnancy that leads to unacceptable increases in foetal and maternal morbidity and mortality, particularly in less developed nations[8]. In this study, it was found that, in PIH placenta underwent definite morphological changes. These changes seemed to be the result of insufficiency of placenta in PIH. There is definitive reduction in weight, volume, thickness and diameter of placenta in PIH.

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