

A Study on Morphology of Placenta in Pregnancy Induced Hypertension in Bikaner, Rajasthan.

Part -4 (Medical Science)

Chapter-I

June/Vol.2.0/Issue-I

Abstract:

BACKGROUND: Placenta is a discoid organ which is transient and is responsible for the proper growth and survival of the developing fetus. According to Park (2009) the hypertensive disorders are responsible for 5-8 % of all maternal deaths. A wide variation in placental size has been reported in Pregnancy induced hypertension (PIH) women. Hypertension is one of the commonest complications which occur during pregnancy. It may occur in various forms: Gestational Hypertension, Preeclampsia and Eclampsia.

OBJECTIVES: To study the morphological parameters of placenta in normal pregnancy and in PIH cases.

MATERIAL AND METHODS: This comparative study was carried out in department of Anatomy, S.P. Medical College, Bikaner, Rajasthan. Total of 100 placentas were collected, Out of which, 50 placentas were from uncomplicated full term deliveries and served as control group. Another 50 placentas were collected from PIH cases. Various morphological features of placentas were studied like weight, shape, diameter, surface area, number of cotyledons, attachment of placenta etc.

RESULTS: This study revealed reduction in the weight, diameter, surface area and number of cotyledons in placenta in majority of PIH cases as compared to normal pregnancy.

KEYWORDS: Placenta, Morphology, Pregnancy induced hypertension.

ISSN CODE : 2456-1045 (Online)

(ICV-MDS/Impact Value): 2.22

(GIF) Impact Factor : 1.827

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Journal Code : ARJMD/MDS/V-2.0/C-1/June-2016

website : www.journalresearchijf.com

Received : 29.05.2016

Accepted : 04.06.2016

Date of Publication :30.06.2016

Page: 30-33



INTRODUCTION

Placenta is a discoid organ which is transient and is responsible for the proper growth and survival of the developing fetus [1]. Placenta connects the developing fetus to the uterine wall. Fetus derives its nutrition, elimination of waste and exchange of gas through placenta via maternal blood supply. [2] The adequate fetal growth is totally dependent on morphological parameters of Placenta. [3,4]. Hypertension is one of the commonest complications which occur during pregnancy. It may occur in various forms: Gestational Hypertension, Preeclampsia and Eclampsia [5] The Hypertensive disorders are responsible for 5-8 % of all maternal deaths.[6] Placental morphologic changes vary substantially in pre-Eclampsia and Eclampsia that affects the growth of foetus. In pregnancy induced hypertension, there is increased resistance to utero-placental circulation which adversely affects the growth of placenta in terms of weight, thickness, surface area and volume. These abnormalities ultimately result in unfavourable outcome of pregnancy with reduction of fetal weight.[7,8] The examination of the placenta in utero as well as postpartum, gives valuable information about the state of the foetal well being .Careful examination of placenta can give information which can be useful in the management of complications in mother and the new-born.[9]

OBJECTIVES

To study the Morphological parameters of Placenta in normal pregnancy and in PIH cases.

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MATERIAL AND METHODS

This comparative study was carried out in department of Anatomy, S.P. Medical College, Bikaner, Rajasthan. A total of 100 Placentas were collected from department of Obstetrics & Gynaecology. Out of which, 50 placentas were from uncomplicated full term deliveries and served as control group. Another 50 placentas were collected from PIH cases. A detailed history of mother regarding the socio-demographic profile, present and past obstetric history were recorded on a pre-structured proforma. All placentae were collected immediately after delivery and washed in running tap water. Any abnormality of cord and membranes was noted. The placentae along with cord were coded and preserved in 10 % formalin solution. Various morphological features of placenta were studied like weight, shape, diameter, surface area, number of cotyledons, attachment of umbilical cord with placenta etc. All the morphometric parameters of the placentae were recorded using standard procedures.

STATISTICAL ANALYSIS

The collected data was entered on the excel spread sheet, processed and analysed by using the SPSS 17.0 version. Data was analysed by calculating mean, S.D. and proportions. The tests of significance applied were Chi-square test, unpaired ‘t’ test.

RESULTS

Table 1: Morphological features of placenta

Placental characteristics	Normal pregnancy			Pregnancy inuced hypertension			Statistics
	Mean	SD	No.	Mean	SD	No.	
Weight (gm)	432.68	62.57	50	344.78	47.81	50	t=7.893, p=0.000
Diameter (cm)	17.63	1.67	50	14.52	1.40	50	t=10.091, p=0.000
Thickness (cm)	2.37	0.28	50	1.81	0.18	50	t=11.896, p=0.000
Surface area (sq. cm)	231.12	48.23	50	183.15	54.58	50	t=4.657, p=0.000
No. of cotyledon	16	2.14	50	13.89	3.25	50	t=3.834, p=0.000
No. of calcified areas	4.14	1.18	50	11.8	2.14	50	t=22.164, p=0.000
Birth weight of baby (gm)	2680	395	50	2210	470	50	t=5.413, p=0.000

Table shows that the mean Placental weight in control group is 432.68±62.57 gm while in PIH group is 344.78±47.81 gm, the difference is significant (P<0.05). Similarly the mean diameter in control and PIH group is 17.63±1.67 cm and 14.52±1.40 cm respectively with significant (P<0.05) difference.

The mean thickness in control and study group is 2.37±0.28 & 1.81±0.18 cm respectively and this difference is also significant (P<0.05). The mean surface area in control and study group is 231.12±48.23 & 183.15±54.58 sq. cm respectively and this difference is also significant (P<0.05).

In our study the mean of number of cotyledon in control group is 16±2.14 and in study group 13.89±3.25, the difference is not statistically significant (P>0.05).

Calcification is found more in PIH (Study) group.

Mean birth weight of baby was found to be 2680±395gm & 2210±470 gm respectively in control and PIH group. The difference I mean weight between both groups was found to be statistically significant.

Table 2: Attachment of the umbilical cord to the placenta in Normal and PIH cases.

Attachment of the umbilical cord	Normal pregnancy	PIH cases	Statistics
Central	38 (76%)	27 (54%)	$\chi^2=4.396, p=0.036$
Eccentric	12 (24%)	23 (46%)	
Total	50	50	

Table shows that in most of normal pregnancy, the umbilical cord was attached centrally to the placenta while in PIH cases cord was attached centrally and eccentrically.

DISCUSSION

In present study, mean Placental weight in control group was 432.68 ± 62.57 gm while in PIH group was 344.78 ± 47.81 gm, the difference is significant ($P < 0.05$). Similar findings were noted by Damania KR et al [10], Mohan H et al [11], Mallik B G, Mirchandani J J and Chitra S [12], Kaur P et al [13], Das B et al [14], Udania A, Jain ML [1], Rath G et al [15], Majumadar S et al [16].

The mean diameter in control and PIH group was found to be 17.63 ± 1.67 cm and 14.52 ± 14.0 cm respectively with significant ($P < 0.05$) difference. Similar findings were observed by Kishwara S et al [17] and Barkar DJP et al [18].

The mean thickness in control and study group is 2.37 ± 0.28 & 1.81 ± 0.18 cm respectively and this difference is also significant ($P < 0.05$). while in an another study by Devishankar et al [19] also showed the reduction in central thickness but this was found not significant ($p > 0.05$).

In the present study, the mean placental surface area in PIH group was less than control group and this reduction was found to be significant ($p < 0.05$); similar results were found by Udania A et al [1] and Majumadar S et al [16].

In our study the mean of number of cotyledon in control group is 16 ± 2.14 and in study group 13.89 ± 3.25 , the difference is not statistically significant ($P > 0.05$). Cotyledon numbers were found to be significantly less in hypertensive group which is similar to the findings of the study by Sultana S et al [20] and Majumadar S et al [16].

Calcification is found more in PIH (Study) group as noted by Majumadar S et al [16] and Udania A, Bhagwat SS, Mehta CD [21].

The mean birth weight of new-born baby was less in hypertensive group. The difference in mean weight between both groups was found to be statistically significant. Relations between birth weight and placental area and placental volume have also been described by Das B et al [14] and Udania A, Jain ML [1].

In present study, umbilical cord was attached marginally to the placenta more in PIH case as compared to controls. Similar findings were also reported by Di Salvo DN et al [22] and Alexander DK et al [23].

CONCLUSION

Pregnancy induced hypertension influence the morphology of Placenta which adversely affects the perinatal outcome. The early measurements of placenta by ultrasonography will help in early identification of at risk factor and better management of such pregnancies.

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