Research Article

Correlation of birth weight with placental weight in pregnancy induced hypertension and normal pregnancy

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Abstract

Pregnancy induced hypertension is one of the threatening problem among pregnancy related health problems. Complications arising from it are also common which leads to several maternal and foetal deaths. During pregnancy, examination of mother and foetus done properly but what is overlooked is placenta, as it cannot be measured directly until after birth. Foetal distress, intrauterine foetal death and placental abnormalities are common in pregnancy induced hypertension. Rate of preterm birth ranges from 5 to10 percent of deliveries in developing countries (Hsleh T'Sang-T'Sang 2005). About two third of preterm deliveries are due to spontaneous onset of preterm labour or preterm premature rupture of membranes. Approximately one third follow induction of labours or caesarean section performed for maternal or foetal indication such as preeclampsia, haemorrhage, non-reassuring foetal heart rate or intrauterine growth retardation. Thus, pathologists are frequently called on to evaluate preterm placenta, to determine the cause of the spontaneous preterm birth and/or correlate placental finding with the clinical history (O. M. Faye-Petersen 2008). The risk is increased if placental function has been impaired by pre-eclampsia, post maturity and threatened abortion. The margin may be narrow and hazard may be greater if the placenta is unusually small. Weight of placenta is "functionally significant" because it is related to villous surface area and to total foetal metabolism (Udainia A, Bhagwat S). Pregnancy complicated by hypertension is commonly associated with placental insufficiency, there by resulting in foetal growth retardation. Again reduced utero-placental blood flow has been recognized in cases of severe preeclampsia with hypertension. As stated above, foetal growth is retarded in preeclampsia and that a small infant has usually a small sized placenta. In previous studies it has been revealed that there is clear relationship between pregnancy induced hypertension and morphometric changes in placenta and which ultimately reflects foeto-maternal status. Placental weight is one of placental measure by which placental growth can be characterised. So the present study is carried out on placentae from mothers with pregnancy induced hypertension and placentae from mothers without any materno-foetal complication (normal placentae). Two hundred and one placentae, 101 from normal pregnancies and 100 from pregnancy induced hypertension pregnancies, were examined. Weight of placenta was taken in gram by using standard weighing machine after removing membranes and cutting cord leaving 2.5 cm attachment. Weight of new born baby was taken on standard weighing machine immediately after cord tying and cutting. In present study the mean placental weight in normal group is 469.50gm. And in pregnancy induced hypertension group is 420.98gm., from this finding it is concluded that the placental weight in pregnancy induced hypertension cases is significantly less than the placental weight in normal group. The mean birth weight in normal group is 2556.9gm. and in pregnancy induced hypertension it is 2192.50gm. So the birth weight in pregnancy induced hypertension is significantly low as compared to normal group. The ratio between birth weight and placental weight in pregnancy induced hypertension group is significantly lower than normal. It is concluded that correlation between birth weight and placental weight in normal group is moderately correlated (r=0.484), where as in pregnancy induced hypertension is strongly correlated(r=0.836).

Keywords: pregnancy induced hypertension, birth weight, placental weight, correlate birth weight andplacental weight.

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Pregnancy induced hypertension is one of the threatening problem and complication arising from it are also common which lead to several maternal and foetal deaths. Pregnancy complicated by hypertension is commonly associated with placental insufficiency, there by resulting in foetal growth retardation. Foetal growth is retarded in preeclampsia and that a small infant has usually a small sized placenta. Placental weight is one of placental measure by which placental growth can be characterised. So the present study is carried out on placentae from mothers with pregnancy induced hypertension and placentae from mothers without any materno-foetal complication (normal placentae).

MATERIAL AND METHODS

Two hundred and one placentae, 101 from normal pregnancies and 100 from pregnancy induced hypertension pregnancies, were examined. Weight of placenta was taken in gram by using standard weighing machine after removing membranes and cutting cord leaving 2.5 cm attachment. Weight of new born baby was taken on standard weighing machine immediately after cord tying and cutting. Cases selected are those patients who were having blood pressure 140/90mmHg or more with or without oedema/proteinuria. None of these cases had hypertension prior to pregnancy. In control group, pregnancies with normal blood pressure and without oedema/proteinuria were included. Only placentae from 36 to 40 weeks of pregnancy were included in this study because of their easy availability, and because cases of premature termination before this time are associated with abnormal pregnancy, so that it is then difficult to form a control group. Only cases with live births were included.

Figure 1

OBSERVATION AND RESULT

Table 1: Showing mean weight (in gm) of placentae of normal group and (pregnancy induced hypertension) PIH groups

Groups	Normal	PIH
Number of placenta	101	100
Mean weight of placentae (gm)	469.50	420.98
SD	48.541	68.070

P value<0.001

Above table shows that the mean weight in normal placentae is 469.50gm, while in PIH placentae it is 420.98gm. The table shows that the mean weight of placentae in PIH is lower than the normal placentae. The findings are highly statistically significant.

Table 2: Showing mean birth weight from patients whose placentae was examined i.e. from normal and (pregnancy induced hypertension) PIH group

Groups	Normal	PIH
Number of patients whose baby's birth weight measured	101	100
Mean birth weight (gm)	2556.93	2192.50
SD	363.389	410.923

P value=<0.001

Above table showing mean birth weight from patients whose placentae was examined i.e. from normal is 2556.93gm, while that from PIH is 2192.50gm. It shows that the mean birth weight in PIH pregnancies is lower than the normal pregnancies. The findings are statistically significant.

Table 3: Mean of ratio between birth weight and placental weight in normal and (pregnancy induced hypertension) PIH groups

Groups	Normal	PIH
Number	101	100
Mean of ratio birth weight/weight of placenta	5.465	5.212
SD	0.7103	0.5359

P value=0.005

The above table shows mean of ratio between birth weight and placental weight in normal group is 5.465; while in PIH group are 5.212. The table shows that the mean ratio between birth weight and placental weight in PIH group is significantly lower than normal. The findings are statistically significant.

Table 4: Showing Pearson's correlation coefficient (r) between birth weight and weight of placenta

	'r' value	'p' value
Normal	0.484	0.000
PIH	0.836	0.000

Both these coefficients are positive and significant. Above table shows that the correlation between birth weight and weight of placenta in normal is moderate where in PIH is strong.

DISCUSSION

In the present study, mean placental weight in normal group is 469.50 gm and in pregnancy induced hypertension group is 420.98 gm. It is observed that the mean placental weight is significantly low in placentae from pregnancy induced hypertension group as compare to normal group. Findings of the present study correlated with those of the previous studies. Udainia A; Jain M.L (2001) observed maximum weight of placenta in control group was 700 gm and minimum weight of placenta in it 250 gm. In pregnancy induced hypertension they found maximum weight of placenta 650 gm while minimum weight 200 gm. In present study, the maximum weight of placenta in control group is 600 gm and minimum weight of placenta in it is 380 gm. In pregnancy induced hypertension our study found maximum weight of placenta 550 gm while minimum weight 250 gm. Thomson (1967) observed that birth weights were lower in cases of preeclampsia. Majumdar *et al*. observed that foetal weight is significantly less in the hypertensive group. In present study the birth weight is significantly lower in pregnancy induced hypertension group than normal group. Luis A. Cibils (1973) observed mean of ratio between birth weight and placental weight in normal was 5.20±0.76, Samuel lurie (1999) observed it was 5.6±0.96, Rath G,Garg K, and Sood M. Found it as 7.11, Majumdar observed it was 5.89±10.04.In present study it is 5.465 in normal. In present study, mean of ratio between birth weight and placental weight in pregnancy induced hypertension is 5.212, Majumdar *et al*. observed it was 6.23±0.87 while Luis A.Cibils found it as 5.22±0.74. Majumdar *et al* found high value of ratio in pregnancy induced hypertension than normal. Luis A. Cibils found it was not significant. Thomson *et al*. (1969) found that mean of ratio between birth weight and placental weight in pregnancy induced hypertension is less than normal group. Thomson *et al*. (1969) found that placental weight and birth weights were moderately correlated (r=0.5-0.6). Janthanaphan M *et al*. (2006) studied 238 normal pregnancies, between the 36^{th}-40^{th} gestational week their study observed that placental weight significantly related with birth weight (r=0.450).

CONCLUSION

In present study the mean placental weight in normal group is 469.50gm. And in pregnancy induced hypertension group is 420.98gm., from this finding it is concluded that the placental weight in pregnancy induced hypertension cases is significantly less than the placental weight in normal group. The mean birth weight in normal group is 2556.9gm. and in pregnancy induced hypertension it is 2192.50gm. So the birth weight in pregnancy induced hypertension is significantly low as compared to normal group. The ratio between birth weight and placental weight in pregnancy induced hypertension group is significantly lower than normal. It is concluded that correlation between birth weight and placental weight in normal group is moderate where as in pregnancy induced hypertension is strong.

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