CORELATION OF PLACENTAL WEIGHT AND FETAL OUTCOME IN PREGNANCY INDUCED HYPERTENSION

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Abstracts:
Placenta is a choriodecidual structure developed during pregnancy and is the organ of exchange between the foetus and mother for the purpose of physiological exchange. A study of placental morphology is an indicator of the fact that whether the foetus was compromised in intrauterine life. It also acts as an effective index by examination of which we can predict the status of foetus in neonatal life as it can act as an indicator to the overall development of the foetus in cases of pregnancy induced hypertension.

Key Words: Placenta, Placental weight, fetal weight.

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Introduction:
Mother and Fetus are the two important ends of reproduction. Mother and Fetus come in close contact with each other by a vital organ – “The Placenta”.
Placenta is the most accurate record of the infant’s prenatal experience. After delivery if the placenta is examined minutely it provides much insight into the prenatal health of the baby and the mother. In recent years placenta has drawn attention as valuable indicator for maternal and fetal diseases. Pregnancy complications which are associated with high perinatal morbidity and mortality are reflected in the placenta in a significant way (both macroscopically and microscopically).

Morphologically placentae of hypertensive disorders of pregnancy are lighter in weight, lesser in diameter and thickness, with high incidence of abnormal shape and cord insertion and the fetoplacental ratio is diminished.
Foetal outcome is adversely influenced by pathological changes observed in placenta.

Material and Methods:
The present study is a prospective study in which a total of 200 placentae i.e., 100 placentae from cases of hypertensive disorder of pregnancy and 100 placentae from normal cases between 36 to 42 weeks of gestation, attending the SSG Hospital attached to Medical College, Vadodara were studied.

Inclusion Criteria:
Control Group-
- Systolic B.P. <140 mm Hg,
- Diastolic B.P. < 90 mm Hg.
- No Oedema
- No Proteinuria

- Pre-eclampsia-
  - Systolic B.P. ≥140 mm Hg,
  - Diastolic B.P. ≥ 90 mm Hg.
  - With and without Oedema and/ or Proteinuria

- Eclampsia
  - Convulsions with Pre-eclampsia

- Singleton pregnancy
- Gestational age 36-42 weeks.

Exclusion Criteria:
- Gestational age < 36 weeks
- Gestational age > 42 weeks
- Multiple pregnancies.

Detailed obstetric and medical histories were taken for all cases, clinical examination done and they were subjected to urine sugar and albumin, Hb%, Blood grouping and Rh typing.
Just after delivery all the placentae were collected in a clean tray. The membranes and cord at their attachment to the placenta were cut off. The placenta was gently expressed so as to remove its blood content and then washed thoroughly under tap water, mopped with dry cotton pad and weighed.

At the time of delivery fetal birth weight was noted.
Comparison between the study groups was analysed by chi square test.

Result:

Following tables shows the observations made during the study.

In the present study a total of 200 placentae were studied, out of which 100 placentae were collected from pregnancy induced hypertension and 100 placentae from normal cases as control. Among 100 cases of PIH 70 belong to mild PIH and 30 belongs to severe PIH category. Following tables shows the observations made during the study.

Table 1: Comparison of weight of the placentae in different groups:

<table>
<thead>
<tr>
<th>Sr</th>
<th>Wt of Placentae(gms)</th>
<th>Control</th>
<th>PIH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. Of cases</td>
<td>% Mild</td>
<td>No of cases</td>
</tr>
<tr>
<td>1</td>
<td>&lt;200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>200-</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>
Placental weight in the present study varies between 250 to 650 in control group with mean wt of placenta 481.5 gms. In Mild PIH group it varies between 250 to 600 gms. with mean wt. of placenta 415.7 gms. In Severe PIH group it varies between 200 to 550 gms. with mean wt. of placenta 365 gms.

Placental wt shows marked variation in all the groups and coefficient of variation was higher in severe PIH group but mean weight was less with increased severity of PIH. The observations were tested statistically by chi square test and the chi square value is 54.95 with P<0.005 which shows that difference between the mean weight of placenta in different groups is due to severity of PIH and not by chance.

Graph:1 Relation of Placental weight with severity of Pregnancy Induced Hypertension (Distribution in %)
Table 3: Comparison of weight of baby in different groups:

<table>
<thead>
<tr>
<th>Sr</th>
<th>Wt of Baby (gms)</th>
<th>Control</th>
<th>PIH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. Of cases</td>
<td>%</td>
<td>Mild</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No of cases</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>&lt;1000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1000-1500</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>1500-2000</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>2000-2500</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>2500-3000</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>6</td>
<td>3000-3500</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>70</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 4: Observation of weight of the placentae in different groups and its statistical analysis:

<table>
<thead>
<tr>
<th>Observation</th>
<th>Control</th>
<th>Mild PIH</th>
<th>Severe PIH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean wt of baby (gms)</td>
<td>2587</td>
<td>2379</td>
<td>2030</td>
</tr>
<tr>
<td>Max. wt of baby (gms)</td>
<td>3500</td>
<td>3500</td>
<td>3500</td>
</tr>
</tbody>
</table>
Birth weight of Baby in the present study varies between 1100 to 3500 in control group with mean wt of Baby- 2587 gms. In Mild PIH group it varies between 1000 to 3500 gms. with mean wt. of Baby- 2379 gms. In Severe PIH group it varies between 800 to 3500 gms. with mean wt. of Baby 2030 gms.

Baby wt shows marked variation in all the groups and coefficient of variation was increased with severity of PIH and mean weight was less with increased severity of PIH. The observations were tested statistically by chi square test and the chi square value is 39.93 with P<0.005 which shows that difference between the mean weight of babies in different groups is due to severity of PIH and not by chance.

Graph 2: Relation of Baby weight with severity of Pregnancy Induced Hypertension (Distribution in %)

Discussion:
Hypertensive disorders of pregnancy are one of the leading causes of maternal morbidity/mortality and perinatal morbidity/mortality. The aetiopathogenesis of hypertensive disorders of pregnancy still remains a subject of controversy. The classical view in this regard focuses on the placenta and the utero placental circulation. Although the study of the placenta is, retrospective in nature, yet it provides a reflection of hazards the foetus has been subjected to during its growth and development. Normally a placenta weighs from 400 to 800gms. This study observed the reduction of placental weight in the hypertensive disorders. Bandana Das et al\(^3\) (1996), Sharma et al\(^7\) (1981), Dutta et al\(^6\) (1989) and Nobis & Das et al\(^5\)(1991) also reported the same findings.

In the present study placental weight varies between 250 to 650 gms. The mean placental weight was found to be of 481.5 gms in control group of present study while it was 485.85 gms. in study of Majumdar S and Dasgupta H et al\(^9\) (2005).

In the present study the mean placental weight in mild PIH was 415 gms. and in severe PIH 365 gms. It is in conformity with the findings of Chakravorty because in study conducted by Chakravorty et al\(^8\) (1967) it was 410 gms in mild and 350 gms in severe PIH.

In the present study birth weight of babies varies between 1100 to 3500 gms. In control group with mean birth wt of 2587 gms. whereas in Mild PIH it varies between 1000 to 3500 gms, with mean wt 2379 gms. and in severe PIH it varies between 800 to 3500 gms. with mean wt 2030 gms. Thus in the present study the birth wt of baby was found to be decreased with increasing degree of severity of PIH and this decrease was found statistically significant. Chakravorty et al\(^8\) (1967), Majumdar S and Dasgupta H et al\(^9\) (2005) also found similar type of observations.

There is a linear relationship between Placental weight and Birth weight of baby that can be expressed by placental coefficient or foeto placento ratio. In the present study Placental coefficient (Placento foetal ratio) was taken. Although the mean Placental Coefficient was same in severe PIH and control group but the range is wider in severe PIH as compared to control group and coefficient of variation was higher in severe PIH group.

Conclusion:
Placental weight shows marked variation in all the groups and coefficient of variation was higher in severe PIH group but mean weight was less with increased severity of PIH. Baby weight shows marked variation in all the groups and coefficient of variation was increased with severity of PIH and mean weight was less with increased severity of PIH.

From the present study it can be concluded that, the pregnancy induced hypertension adversely influences the weight of the placenta and foetal outcome. Thus placenta acts as an effective index by examination of which we can predict the status of Foetus in neonatal life as it can act as an indicator to the overall development of the Foetus in PIH cases.

References: