

Effect of Maternal Preeclampsia on the Weight of the Placenta

Segupta Kishwara¹, Abu Sadat Mohammad Nurunnabi², Mahamuda Begum³, Khandaker Abu Rayhan⁴, Shamim Ara⁵

Abstract:

Context: Preeclampsia is a relatively common pregnancy disorder that is related to the placenta and causes variable maternal and foetal problems. Alterations in placental weight are evident in moderate to severe maternal preeclampsia.

Study design: Cross-sectional descriptive type.

Place and period of study: Department of Anatomy, Dhaka Medical College, Dhaka from August 2005 to June 2006.

Materials & Methods: 60 human placentae from Bangladeshi women were collected from the Department of Obstetrics & Gynaecology of Dhaka Medical College Hospital and Mitford Hospital, Dhaka of which 30 from normal uncomplicated pregnancies (control group or group A) and another 30 from pregnancies complicated by preeclampsia (preeclampsia group or group B), where the patients were normotensive previously.

Results: The mean weight of the placenta was 406.90 ± 72.64 gm in control group (group A) and 311.50 ± 74.09 gm in preeclampsia group (group B) respectively. The mean difference in weight between two groups was statistically significant ($P < 0.001$).

Conclusion: Placental weight was found reduced in maternal preeclampsia in comparison to that of normal pregnancy.

Key words: weight of placenta, preeclampsia.

Introduction:

Preeclampsia is a relatively common pregnancy disorder that originates in the placenta and causes variable maternal and fetal problems¹. It usually develops after 20 weeks of gestation and resolves after delivery of placenta². At full term, the normal placenta is blue-red, flattened meaty discoid mass, having an weight of 200-800 gm (average 500 gm)³.

The architecture of the placenta is found to be changed in many maternal diseases like diabetes mellitus, hypertension, preeclampsia, eclampsia etc. Different morphological changes are found in the placenta of preeclamptic mothers e.g. reduction in weight, diameter and volume⁴. It is plausible that the maternal microvascular damage and endothelial dysfunction associated with hypertension may cause the utero placental vascular insufficiency leading to morphological changes of the placenta and subsequently the development of other risk factors responsible for the adverse perinatal outcome^{5,6}. Many foreign studies have shown the effect of hypertensive disorders of pregnancy on the placental weight and the overall status of the mother and the baby. They reported the moderate to severe reduction of placental weight in preeclampsia and eclampsia^{7,8,9,10}. But only a few studies have been

1. Assistant Professor (c.c.), Department of Anatomy, Dhaka Medical College, Dhaka.

2. Lecturer, Department of Anatomy, Dhaka Medical College, Dhaka.

3. Associate Professor and Head, Department of Anatomy, Dhaka Community Medical College, Dhaka

4. Associate Professor, Department of Anatomy, Prime Medical College, Rangpur.

5. Professor and Head, Department of Anatomy, Dhaka Medical College, Dhaka.

For correspondence: Dr. Segupta Kishwara

done in our country in this field. So, it demands a wide exploration to find out the effect of maternal preeclampsia on the weight of the placenta. The present study is directed to correlate whether there is any difference between weight of the placenta of preeclamptic women and that of normal pregnant women in Bangladesh.

Materials and Methods:

Materials:

A cross-sectional descriptive study was carried out in the Department of Anatomy, Dhaka Medical College, Dhaka from August 2005 to June 2006 on 60 human placentae from Bangladeshi women, of which 30 collected from normal uncomplicated pregnancies (considered as control group or group A) and another 30 from pregnancies complicated by preeclampsia (considered as preeclampsia group or group B) where the patients were normotensive previously. The placentae were collected from pregnant women whose deliveries (either normal vaginal delivery or Caesarean section) were conducted in the Department of Obstetrics & Gynaecology, Dhaka Medical College Hospital and Mitford Hospital, Dhaka. Pregnant women were selected between 35-40 weeks of gestation. Selection of the control and the study group was done on the basis of diagnosis by a registered physician or from the hospital record. Each of the placentae was collected in a labeled plastic bag within 6 hours of delivery.

Methods:

Procedure of the study:

60 placentae were considered for estimation of their weight. Placental weight was measured on a weighing machine graduated in grams (gm).

Results:

The mean weight of the placenta was found 406.90 ± 72.64 gm (range 250-560 gm) in control group (group A) and 311.50 ± 74.09 gm (range 160-460 gm) in preeclampsia group (group B) (Fig.1). The difference in weight between two groups was statistically significant ($P < 0.001$).

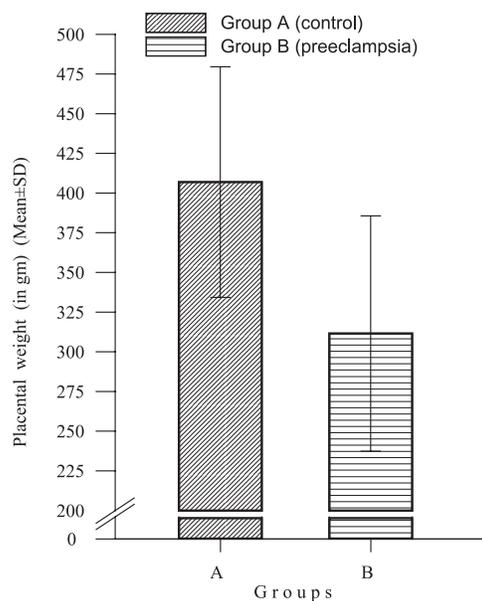


Fig.-1: Weight of the placentae in normal (control) and preeclamptic women.

Discussion:

Cibils¹¹ studied pregnancy outcome in 57 hypertensive and 19 normal patients. The placentae were studied immediately after expulsion and weighed. The hypertensive patients were grouped as toxemia (preeclampsia or eclampsia) or pre-existing hypertension, as well as moderate or severe hypertension. He found that the average weight in normal cases was 653 grams. In the group with moderate or transient hypertension, the average placental weight was 525 grams. In cases of severe or chronic hypertension, the placenta weighed an average of 471 grams. He commented that the placentae from hypertensive patients were significantly smaller than the normal, suggesting that the pathologic process interferes with the normal placental growth. Shah et al.¹² found that the mean weight of placenta decreases with increasing severity of toxemia, while placental weight and birth weight increase with the age and parity of the mother. Teasdale⁴ observed a reduction of placental weight in preeclampsia but the difference did not reach a significant level. Later, Teasdale⁹ stated that the mean placental weight was significantly lower than that of the control group. He also stated that this difference in placental weight was the result of a

much more significant decrease in parenchymal tissue than in the non parenchymal tissue. Sodhi et al.¹³ observed a lower placental weight in preeclampsia / eclampsia group. Barua¹⁴ observed that placental weight was significantly lower in the eclampsia group than in the control group. Begum¹⁵ found that mean placental weight was lower in pregnancy induced hypertension group than that of the control group. In the present study, it was observed that there was significant reduction of placental weight in maternal preeclampsia and conforms to the reports of Cibils¹¹, Shah et al.¹², Teasdale⁹, Sodhi et al.¹³, Barua¹⁴ and Begum¹⁵.

Fox⁷ attributed abnormal maternal uteroplacental vasculature to the weight reduction. Soma et al.⁸ also stated that it must be assumed that morphological and histological findings in hypertensive placentae are due to the occlusion or narrowing of the uteroplacental vasculature as well as placental ischemia. Later, Fox & Jones¹⁰ and Teasdale⁹ suggested that the ischaemia was the dominating factor for the morphological alteration of the placenta.

Conclusion:

It was observed that there is a significant reduction of placental weight in maternal preeclampsia and placental changes are the aftermath of ischaemia and its sequential effect i.e. reduction in placental parenchyma.

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