

## A Study of Morphology of Placenta in Eclampsia of Pregnancy and its Effect on Fetal Outcome

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Received: 15-01-2022 / Revised: 23-02-2022 / Accepted: 30-03-2022

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Conflict of interest: Nil

### Abstract

The placenta is the most important organ for maintaining healthy pregnancy. Eclampsia is one of the common disorders during pregnancy. The present study was done on 200 placentae in Department of Anatomy Dr. S. N. Medical College, Jodhpur to find out the morphological changes in placentae of eclamptic group in comparison to those of control group. In the present study 100 placentae with normal pregnancy and 100 placentae with eclampsia of pregnancy were collected and the newborns were also evaluated for birth weight, type of birth and NICU admission. It was found that the eclamptic group had low placental weight, less maximum diameter, less thickness at centre and less number of cotyledons ( $p < 0.0001$ ). Thus, eclampsia of pregnancy had adverse effect on placenta and in turn on the fetus as the mean birth weight of new born in eclamptic subjects was lower than normal subjects.

**Keywords:** Eclampsia, Placenta, Morphology.

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### Introduction

Placenta is the only vital organ of perinatal life which can be examined without hazard to the mother and baby.[1] Placenta is the most accurate record of the infants prenatal experience.[2] Complications during pregnancy like eclampsia can be reflected on placenta. Eclampsia is a potentially fatal disorder of pregnancy with a significant maternal and fetal morbidity and mortality rate.[3] In India, its incidence is reported to be 220/10,000 deliveries.[4] The aim of present study was to see the spectrum of change in the

morphology of eclamptic placenta and its effect on fetal outcome.

### Material and methods:

A cross sectional observational study was done in in Department of Anatomy, Dr. S.N Medical College Jodhpur. The placentae from 200 pregnant females were collected from Department of Obstetrics and Gynecology after taking informed consent. The placentae were fixed in formalin and studied. The subjects were divided into: –

**Group-1:** 100 placentae were collected from healthy controls (normotensive subjects). The average blood pressure of normal pregnant woman was 110-120 mm of Hg systolic and 70-80 mm of Hg diastolic. Any increase over 130 mm of Hg systolic and 90 mm of Hg diastolic were excluded from control group.

**Group-2:** 100 placentae were collected from eclamptic subjects having diastolic blood pressure of at least 90 mm of Hg or a systolic pressure at least 140 mm of Hg. The blood pressures were recorded on at least two occasion 6 hours or more. Apart from blood pressure there must be at least one episode of convulsion and their number was 100.

The placenta was inspected for:

**Shape:** The shape of the placenta was recorded after proper inspection. Each placenta was categorized as oval, circular or irregular in shape (Figure 1A).

**Maximum diameter:** The placenta was trimmed and placed in a flat tray after mopping. At first, the maximum diameter was measured with a Vernier caliper. Then a second maximum diameter was taken at right angles to the first one. The mean of two measurements was considered as the diameter of placenta and expressed in centimeter. (Figure 1B).

**Thickness of the placenta:** Thickness of the placenta was measured from the center. This was measured by piercing the knitting needle in the center of placenta and the embedded part of the needle was measured by the scale in centimeters<sup>1</sup>.

**Weight of placenta:** The placenta was washed and clots were removed and placenta dried with filter paper. Umbilical cord was cut through the nearest point of placenta, and membranes were trimmed and the weight was measured in grams on the balance.

**Number of Cotyledons:** The placenta was put on a flat tray with maternal side facing

upward by placing a block of paraffin on the fetal side. Then counting was started from the left side of the one end of the placenta going rightward and again turning back to the left in a manner of loop. This counting procedure was repeated until the other end of the placenta was reached. The total number of cotyledons was recorded. [10]

The newborn was inspected for:

**Birth weight:** The birth weight was recorded on balance machine in kilograms.

**Type of Birth:** Live birth or still birth was noted.

**NICU admission:** If done was noted.

Statistical significance of difference between two groups was calculated by using unpaired 't' test. A difference between the two groups was considered to be significant when  $p < 0.05$ .

#### **Result:**

In the present study the shape of placenta was mostly circular (70%) in control group where as it was oval in (54%) of cases in eclamptic group (**Table-1**).

The mean weight of placentae was less significantly in eclamptic group (312.88 gm) than in controls (492.90 gm) ( $p < .0001$ ). The mean diameter, mean thickness and mean number of cotyledons were also significantly less in eclamptic group than in control group ( $p < .0001$ ).

The mean birth weight was 2.9495 kg in control group and 1.9450 kg in eclamptic group. The difference was statistically significant ( $p < .0001$ ). Still births were reported only in eclamptic group (27%) and admission in NICU was also needed more in (14%) cases in eclamptic group than in control group (4%) case (**Figure 3 & 4**).

Thus, eclampsia of pregnancy causes significant changes in shape, diameter and thickness of placenta which in turn can affect fetal outcome.

**Table 1: Distribution of shapes of placenta**

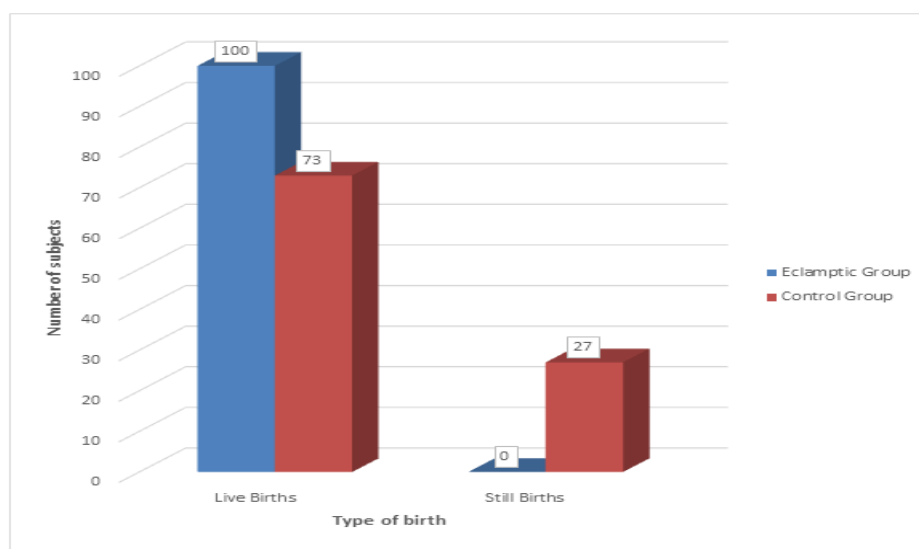
Shape of Placenta	Eclamptic Group	Control Group
Oval	14	54
Circular	70	36
Irregular	16	10
<b>Total</b>	<b>100</b>	<b>100</b>

**Table 2: Distribution of various parameters of placenta and newborn**

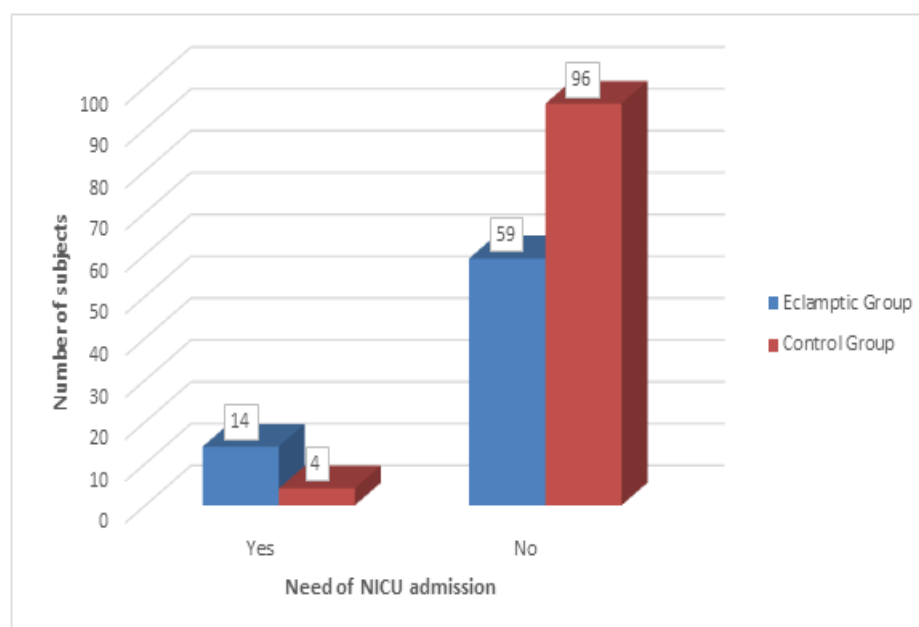
Parameter	Eclamptic Group (Mean±SD)	Control Group (Mean±SD)	P-Value*
Weight	492.90±74.75	312.88±96.17	< 0.001
Diameter	18.3595±1.3159	15.6514±2.0330	< 0.001
Thickness	2.1310±.4618	1.6662±.4884	< 0.001
No. of cotyledons	17.73±1.04	14.26±1.98	< 0.001
Wight of newborn	2.9495 ± 0.4261	1.9450 ± 0.6205	< 0.001

\*Unpaired 't' test

**Figure 1: Shapes of Placenta (a–irregular, b–circular, c–oval)****Figure 2: Diameter of placenta**



**Figure 3: Type of birth in study groups**



**Figure 4: Need to NICU admission**

### Discussion:

In the present study the shape of placenta was mostly circular in control group (70%) where as it was oval in in eclamptic group (54%). Similar results were observed by Sengupta [7] where he found most of placentae were circular in control group (43.3%) and oval in preeclamptic group (40%). Shah [8] found no significant difference in oval or rounded shaped placenta. The mean weight of placentae decreases significantly in eclamptic group (312.88gm) than in controls (492.90gm)

( $p < 0.001$ ). Sultana [9] had also found lower placenta weight in eclamptic group then in control groups. The mean diameter, thickness and number of cotyledons was significantly reduced in eclamptic group than in control group ( $p < 0.001$ ). Sultans S [10] also revealed that there was trend of less placental diameter and no. of cotyledons in eclamptic group compared to control group. The birth weight was (2.9495kg) in group 1 and (1.9450kg) in group2. The difference was found to be statistically significant ( $p < .0001$ ). Still birth was

reported only in group 2 (27%) cases & Admissions in NICU was also needed more in (14%) cases in group2 than in group 1(4%) case. Thus eclampsia of pregnancy causes significant changes on morphology of placenta which in turn results in low birth weight, more still births and NICU admissions. [11]

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