

**Gross Features of Placenta in Pregnancy Induced Hypertension**Anup Shyamal<sup>1</sup>, Biswapriya Sinha<sup>2</sup>, Akash Kusum Banerjee<sup>3</sup>, Arnab Bhattacharya<sup>4</sup>,  
Deepali Vidhale<sup>5</sup><sup>1</sup>Associate Professor, Head of the Department, Anatomy. M J N Medical College, Cooch Behar,<sup>2</sup>Assistant Professor, Department of Anatomy, MJN Medical College & Hospital<sup>3</sup>Tutor/Demonstrator, MJN Medical College, Coo Hbehar<sup>4</sup>Assistant Professor, Department of Anatomy I.P.G.M.E. & R. and S.S.K.M. Hospital<sup>5</sup>Professor and HOD, Anatomy, Dr Panjabrao Alias Bhausaheb Deshmukh Memorial Medical College,  
Amravati, Maharashtra, India

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Corresponding Author: Dr. Arnab Bhattacharya

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**Abstract:**

Placenta is the organ belonging to the developing mammalian conceptus which is never incorporated in the body of foetus but it is vital to the well-being of the baby in the womb and it offers protective, nutritional, respiratory, synthetic and excretory functions as well. Thus it exists as a vital link between mother and developing fetus. During pregnancy, maternal body in general and the uterus in particular, get acquainted to several physiological changes and after successful termination of pregnancy return back to the pre-pregnant stage. The outcome of pregnancy depends on many factors. One such factor is the health and wellbeing of mother throughout pregnancy. Any deviation from normal physiology would adversely affect not only the mother and foetus but the other gestational tissues as well.

Rise of blood pressure during pregnancy (gestational hypertension or pregnancy induced hypertension- 'PIH') is one of the most common causes of altered physiological process in pregnancy.

The diagnosis of gestational hypertension is made in women whose blood pressure reaches 140/90 mm Hg or greater for the first time during pregnancy.

**Keywords:** gross features Placenta.

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**Introduction**

**Aims or Objectives:** The principal aim of the present study was to perform a case-control study on comparison of morphological examination of placenta obtained after delivery of pregnant mothers who suffered from pregnancy induced hypertension (as 'PIH' cases) with that of placenta obtained from delivery of pregnant mothers who had an uneventful ante-natal period (as 'normal' controls). [1,2]

The objectives of the study were as under:

To record and compare gross morphological details of two groups of placenta.

**Material and Methods**

The present study entitled "Morphological study of placenta in pregnancy with hypertension" was undertaken at department of Anatomy with co-operation of department of Obstetrics & Gynaecology of our Institution. [3,4]

Prior approval of 'Institutional Human Ethics Committee' was duly obtained before starting the work. [5]

The chief study material was placenta. Forty (40) placenta were collected from Institutional labour room immediately after term delivery of mothers having uneventful antenatal period (as control 'C') .Another forty (40) placenta were collected after term delivery of pregnant mothers who had clinically proven hypertension (pregnancy induced hypertension- PIH) during antenatal period [as cases or Experimental 'E']. Serial numbers were given to all the placenta of each group and all the entries were made with reference to same number throughout. [6,7]

**Inclusion Criteria for all Subjects:**

Age of mother between 20 to 38 years

Subject must be registered in Institutional Hospital

**Specific inclusion criterion for subjects enrolled as cases (experimental):** Clinically proven hypertension in antenatal (beyond 20 weeks of gestation) or in intranatal period.

**Inclusion criteria for Subjects enrolled as controls (normal pregnancy):**

Subjects free from any pre existing clinical disorder.

Uneventful antenatal period

**Exclusion criteria for Subjects enrolled as experiment:**

Hypertension with other gestational disorders, pre-existing hypertension, subjects having still birth, gross congenital anomalies in baby, complicated vaginal delivery, emergency lower segment caesarean section, invasive procedure during gestation

Each placenta was collected soon after delivery from the labour room or from the operation theatre. Placenta as a whole was kept in normal saline in a large container with snugly fitting lid. Then specimen was transported to research laboratory of Anatomy department.

**Preparation for examination of placentae:**

Whole of the specimen of placenta was taken out from the large container and kept on a clean flat surface on the dissection table wrapped with a sheet of polythene.

Gross examination of placentae was performed in fresh state and observations were duly entered in respective columns.

All quantitative tabulated data was subjected to statistical analysis by student ‘t’ test.

**Gross Examination:**

Shape of placenta was observed and recorded as discoid, oval, round, bilobed or any other shape.

Examination of fetal surface and maternal surface was done under following headings

Insertion of cord: eccentric, central, battledore, marginal, circumvallate or velamentous .

Calcification: as whitish spot on surface

Infarction: red or pale patch

Depressed area; representing retro placental haemorrhage

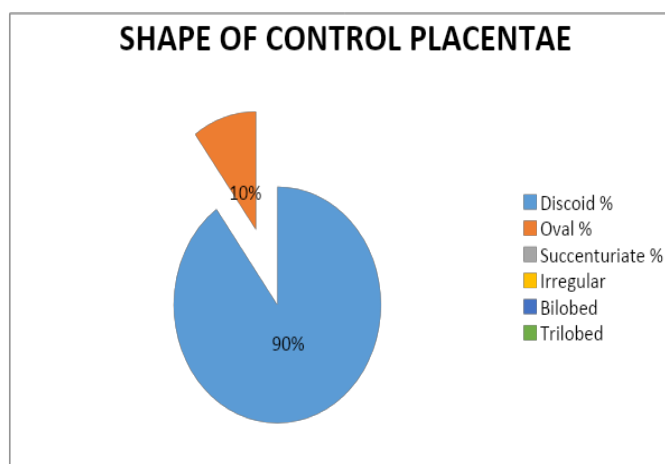
Maternal cotyledons: number was recorded .

**Results:**

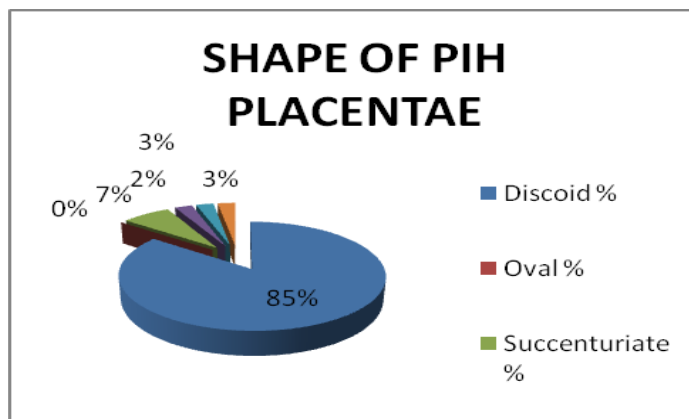
**Shape of placenta:** The shape of control and PIH placentae were of different and the following table and pie chart made it clear.

**Table 1: Shape of Placentae both PIH & Control**

Shape of placentae	Control		Experiment (PIH)	
	n= 40	%	n = 40	%
Discoid	36	90	34	85
Oval	4	10	0	0
Succenturiate	0	0	3	7.5
Irregular	0	0	1	2.5
Bilobed	0	0	1	2.5
Trilobed	0	0	1	2.5



**Graph 1: Percentage of different shape of placentae in control**

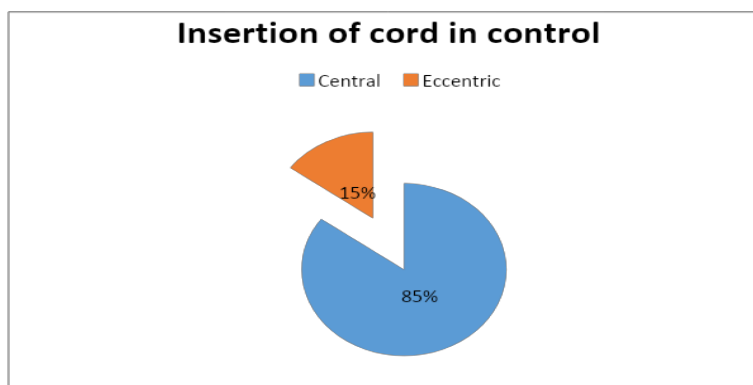


Graph 2: Percentage of different shape of placentae in experiment

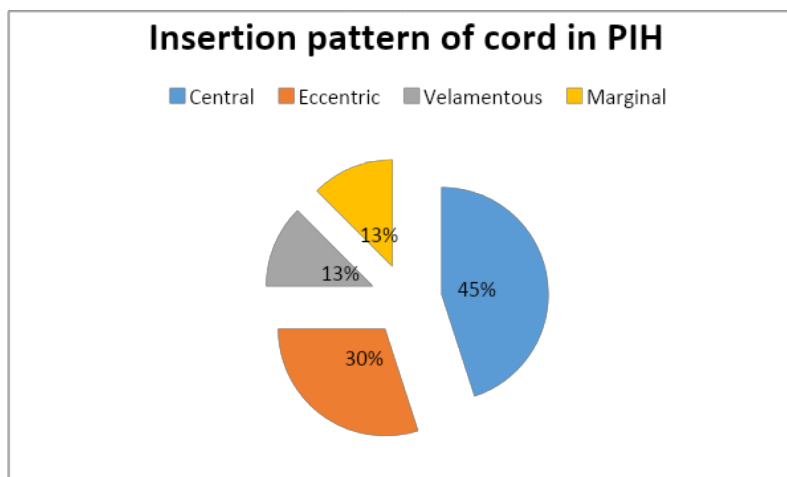
**Foetal surface:** It was smooth and glistening with attachment of cord of several patterns which were as follows:

**Attachment of umbilical cord in placentae of two groups**

Insertion pattern of cord	Subjects Control n =40		Subjects PIH n =40	
	Number	%	Number	%
Central	34	85	18	45
Eccentric	6	15	12	30
Velamentous	0	0	5	12.5
Marginal	0	0	5	12.5



Graph 3: Percentage of types of attachment of cord to placentae in control



Graph 4: Percentage of types of attachment of cord to placentae in experiment

## Discussion

Shanklin (1970), who after studying 5000 placentae, observed a high degree of correlation between anomalous cord insertion and low birth weight. [8,9]

Woods and Malan (1978) studied 940 placentae and found no correlation between the birth weight of baby and the site of insertion of cord in placenta of normal term pregnancies. [10-13]

Perceival (1980) reported that in 73% of PIH cases, the site of insertion of umbilical cord was eccentric. [14]

By sonographic study Pretorius et al (1996) reported that the site of insertion of the umbilical cord of the placenta in hypertensive mothers was mostly marginal. [15]

Di Salvo et al (1998) performed antenatal colour Doppler study in hypertensive mothers and reported that the site of insertion of the umbilical cord of the placenta could be clearly demonstrated by sonographic study and found the cord insertion to be marginal in most of the hypertensive cases. [16]

By gross examination of placentae of different term deliveries, Rath G et al (2000) commented three sites of insertion of umbilical cord as central, intermediate or marginal. They found insertion of the cord to be eccentric or marginal in most of the hypertensive cases whereas cord attachment was reported to be central in most of the normal pregnancies. [17]

Udainia A et al (2004) studied the relation between placental surface area, infarction and foetal distress in pregnancy induced hypertension (PIH) with its clinical relevance on 75 cases of PIH and 24 cases of normotensive pregnancies. [18] They found that the mean surface area was significantly less in severe hypertension (179.14 cm<sup>2</sup>) and in mild hypertension (195.98 cm<sup>2</sup>) as compared to the control group (242.56 cm<sup>2</sup>) and within the same group the surface area was less for foetal distress cases. They observed more variation in the surface area of placenta in presence of foetal distress. [19] In their study placental infarction was present in all the placentae in severe PIH, in 92.5% placentae of mild PIH as compared to only 29% placentae of control group while foetal distress was seen in 37% severe PIH cases, 10% mild PIH cases and in no case in control group. [20]

Majumdar S et al (2005) found that mothers with moderate to severe PIH had smaller, irregular placentae with marginal insertion of umbilical cord. [21]

## Summary and Conclusions:

The present case control study aimed at identifying any gross structural alteration in placenta in condition of Pregnancy induced hypertension 'PIH'

has come out with findings in favour of a definite structural alterations in placenta. [22]

There was deviation in cord attachment from central to eccentric or marginal; deviation from normal oval discoid shape to other shapes such as bilobed, irregular, circumvallate etc and increase in areas of infarction and calcification in experimental group of placentae. [23]

## Conclusions

The present study clearly reveals that the gestational hypertension does cause structural changes in placenta which are negatively affecting the mass and surface area of placenta pertaining to trophoblastic hypoxia and changes compensatory to them.

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