



## Comparative study of placental volume in normal pregnancy and in intrauterine growth restriction

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## ABSTRACT

**Objectives:** to evaluate the differences in placental volume in normal pregnancy and in IUGR pregnancies.

**Methods:** A prospective analytic study was conducted at the Institute of obstetrics and gynecology, Chennai taking 100 IUGR pregnancies and 100 normal pregnancy as subjects over a period of one year from 2014- 2015. Ethical clearance was obtained to do the study. Patients beyond 34 weeks gestation up to term were analyzed using clinical method to assess the fundal height. If there was a lag of 4 weeks they were subjected to ultrasound screening.

**Inclusion criteria :** Patients with a) singleton pregnancy b) well known gestational age c) without maternal medical complication d) with 1st trimester dating scan to confirm gestational age and an anomaly scan and serial ultrasound to see interval growth were taken as subjects.

**Exclusion criteria:** Patients with multiple pregnancy, abnormal placentation, fetal anomaly, severe oligohydramnios, hypertensive and diabetic mothers and patients with other medical disorders were excluded from study.

## KEYWORDS

## INTRODUCTION:

A detailed history taking and clinical examination was done. Each patients name, age, socioeconomic status, occupation were asked. Details of present pregnancy including last menstrual period, 1st trimester ultrasound, bleeding episodes, fever history was asked. Regarding 2<sup>nd</sup> trimester history of iron folic acid intake, immunization history and anomaly scan details were asked and noted.

A detailed clinical examination was done to evaluate the patient's BMI, blood pressure were done. Routine laboratory investigations were done. Obstetric examination was done and lags in fundal height of 4 weeks were taken into consideration. These patients were subjected to ultrasound examination.

The ultrasound machine used in our institution was a 2D Ultrasound with GE of 5MHz curvilinear probe. Fetal parameters like BPD, FL, HC, AC were measured. Estimated fetal weight calculated and confirmed whether it falls below 10<sup>th</sup> percentile. AFI was calculated. Placenta was localized and placental thickness noted at the level of cord insertion. Placental volume measured using concave convex shell formula i.e.,  $V = \pi T/6(4H(W-T)+W(W-4T)+4T^2)$ .

Doppler study of umbilical artery and middle cerebral artery was done. The signals were recorded for a minimum of 5-8 cycles and a blood flow velocity waveform of satisfactory quality was obtained. The image was frozen and resistance index calculated. Cerebroplacental ratio was calculated from RI of MCA/ RI of UA. Doppler was considered abnormal if the RI value of both arteries were above 95<sup>th</sup> percentile for the gestational age, or there was an absent/reversed diastolic flow or if CPR<1.

All cases were observed till delivery. They were followed up with fetal surveillance with daily fetal kick count, modified biophysical score, repeat ultrasound to observe the interval growth. If termination was decided a placental volume was calculated 48hrs before delivery. Mode of delivers noted. Intrapartum fetal surveillance done for vaginal delivery. If planned for a caesarean, then indication is noted. APGAR score and birth weight of babies were noted. after delivery of placenta the cord was clamped close to the placental surface to prevent he loss of blood. Placental volume was calculated.

## RESULT AND ANALYSIS:

let us have a look at the placental volume, Doppler analysis, weight

of babies and perinatal outcome in the iugr group of patients in the following tables.:

TABLE 1 (PLACENTAL VOLUME (IN ml):

GESTATIONAL AGE	NORMAL	IUGR
34- 36 WEEKS	552	335
36- 37 WEEKS	578	424
37- 38 WEEKS	604	469
38-40 WEEKS	647	574

TABLE 2( Doppler analysis among 100 IUGR babies)

CPR<1	52
CPR>1	48

TABLE 3 (BIRTH WEIGHT OF BABIES IN IUGR GROUP):

BIRTH WEIGHT	NO. OF BABIES
<1Kg	2
1-1.5Kg	17
1.6-2 Kg	47
2.1 -2.5Kg	34

TABLE 4: (OUTCOME OF THE IUGR BABIES) :

OUTCOME	NO. OF BABIES
Good	61
IUD	2
NND	9
LOW APGAR	19
MSAF	9

TABLE 5: (The average placental volume by USG and after delivery in IUGR group:)

Gestational age	PV by USG(ml)	PV after delivery(ml)
34-36 weeks	335	329
36-37 weeks	424	417
37-38 weeks	469	455
38-40 weeks	574	580

TABLE 6; (The average placental volume in normal patients by USG and after delivery):

Gestational age	PV by USG(ml)	PV after delivery
34- 36 weeks	552	565
36-37 weeks	578	590
37- 38 weeks	604	613
38-40 weeks	647	635

**DISCUSSION:**

Among the 200 subjects taken as study group the main components of discussion are the placental volume before and after delivery, the difference in placental volume between normal pregnancy and IUGR PREGNANCY and among the IUGR group Doppler analysis, birth weight and perinatal outcome were studied in detail. Placental volume calculated by concave convex shell formula by ultrasound showed a significant increase in volume for each week after 34 weeks of gestation. There was no significant difference in placental volume measured antenatally and after delivery ( $P=0.008$ ) (as shown in table 6) most importantly there was a significant difference in placental volume between normal and IUGR pregnancy (as shown in table 5 and 6). Doppler study being important in diagnosing uteroplacental insufficiency helps in predicting perinatal outcomes and also helps in planning the time of delivery.

**CONCLUSION:**

Healthy baby and healthy mother are the goal of obstetrical management. The diagnosis of uteroplacental insufficiency, the major cause of IUGR, identifies the group of fetuses who are at increased risk for perinatal complication. In this ultra sonography plays a major role. Doppler ultrasonogram helps in identifying fetuses already in hypoxia and acidemia so that early interventions could be done. Placental volume thus has a positive correlation with birth of the baby and perinatal complications. Estimation of placental volume by 2D ultrasound could be better alternative method of antenatal fetal surveillance in case of IUGR where Doppler is not available.

**References:**

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