

## ASSESSMENT OF FETAL MATURITY AND GROWTH BY SERIAL ULTRASONIC MEASUREMENTS OF BIPARIETAL DIAMETER

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### SUMMARY

This study was conducted on 100 gravidas with singleton pregnancies having cephalic presentation to assess fetal maturity and growth by serial ultrasonic measurements of biparietal diameter (BPD).

Mean sonar BPD so obtained was 4.8cm, 7.6cm, 9.2cm at 20, 30, 38 weeks respectively and the mean growth rate of fetal BPD during 20-30 weeks was 0.28 cm/week and 0.17 cm/week during 30-38 weeks. Application of Growth Adjusted Sonographic Age (GASA) (Sabbagha, 1978) enhances the accuracy with which fetal age is defined by reducing the 95% confidence limit from +10 - 11 days to + 1-3 days and places each fetus in large, average and small BPD group.

Serial Ultrasonic cephalometry is a safe, non invasive, non ionising, most convenient and a most accurate method to assess fetal maturity and growth.

### INTRODUCTION :

Modern obstetrics is no longer confined to the process of childbirth only. One of its main objective is to ensure the well being of the fetus in utero. Precise determination of fetal age is important, especially to provide better intranatal and neonatal care to the newborn.

Serial ultrasonic cephalometry is a safe, non-invasive, convenient and accurate method to

assess fetal maturity and growth, at the same time repeated examinations can be done without any harm to the fetus or the mother.

The estimation of gestational age from a single measurement of biparietal diameter obtained after 30 weeks is not sufficiently accurate to be of clinical value, whereas serial measurements from 20 weeks onwards to term gives an idea about fetal maturity and rate of fetal growth and allows a high degree of standardisation for comparison of population and standard reference chart.

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The application of Growth adjusted sonographic age (GASA) (Sabbagha, 1978) enhances the accuracy and places each fetus in large, average and small percentile bracket.

#### MATERIALS & METHODS :

The present study was conducted on 100 gravid women with singleton pregnancy with cephalic presentation attending the antenatal clinic who had their confinement at Umaid Hospital, attached to Dr. S.N. Medical College, Jodhpur, (During Jan. 1987 to Jan.89)

Serial Ultrasonic measurements of biparietal diameter was done in all cases between gestational age 18-40 weeks. All scans were done on real time grey scale apparatus with frequency of 3.5 MHz. All measurements were done at definite interval in each case. First BPD measure-

group. By using GASA chart Sabbagha (1978), fetal growth potential and exact fetal maturity were calculated.

All cases were followed till delivery to know mode of delivery and birth weight of babies.

#### OBSERVATIONS & RESULTS :-

The mean sonar BPD of present series at 20,30 and 38 weeks was 4.8cm, 7.6cm, and 9.2cm respectively (Table No.1)

The mean growth rate of fetal BPD of present study was 0.28 cm/wk between 20-30 weeks and 0.17 cm/wk between 30-38 weeks as shown in table No. II

#### DISCUSSION :

Biparietal diameter is the widest transverse

TABLE I  
Mean Sonar BPD, SD & Z values of Present series.

| S.No. | Gest. Age<br>in weeks | Mean BPD<br>in cm. | SD   | Z test |
|-------|-----------------------|--------------------|------|--------|
| 1.    | 20                    | 4.86               | 0.34 | 1.76   |
| 2.    | 30                    | 7.67               | 0.76 | -1.71  |
| 3.    | 38                    | 9.21               | 0.46 | -1.95  |

TABLE II  
Growth rate of present series.

| S.No. | Gestation age in weeks | Growth rate cm/wk. |
|-------|------------------------|--------------------|
| 1.    | 20 - 30                | 0.28               |
| 2.    | 30 - 38                | 0.17               |

ment was done at 20 weeks, second and third at 30 and 38 weeks respectively. The values so obtained were compared with composite mean value of Sabbagha et al (1978) and growth rate between 20-30 weeks and during 30-38 weeks was obtained.

First measurement is for assessment of fetal maturity and second and third measurement placed each fetus in one of three percentile

diameter of fetal skull and its ultrasonic measurement is the most common means for estimation of gestational age.

Accurate assessment of fetal age is important to evaluate the growth pattern of the fetus and to avoid premature termination of pregnancy in conditions where induction is required. e.g. PET, and to provide better intranatal and neonatal care and thus to reduce perinatal morbidity

and mortality.

Comparative values of mean sonar BPD of present and other different series at 20,30 and 38 weeks is shown in Table No. III. The mean sonar BPD of present series in later half of pregnancy was lower than reported by various western authors. Poor nutritional and socioeconomic status of women in our country and some genetic and environmental factors are thought to be responsible for this.

Comparative values of growth rate of fetal BPD of different series is shown in Table No. IV. The increase in growth rate of present series between 20-30 weeks was linear with slight flattening of growth curve afterwards, this is because the growth of fetal BPD is slower during later week of pregnancy i.e. between 30-40 weeks.

The application of GASA chart (Sabbagha 1978) enhances the accuracy by reducing 95% confidence limit from +10-11 days to +1-3 days and places each fetus in one of three percentile brackets. Large BPD (> 75th percentile) average BPD (25th - 75th percentile) or small BPD (<25th percentile). In present study (at 30 weeks) majority of cases belonged to average

BPD group (68%) followed by small (20%) and large BPD group (12%).

At 38 weeks, 2% cases showed drop from large to average BPD group and 3% cases showed rise from small to average BPD group, so majority of cases were of average BPD group 73% followed by small and large group in 17% and 10% cases respectively. These figures are comparative to study of Abott, R. 1985. IUGR was observed in 2% of cases PET developed in later half of pregnancy was responsible for this. Both underwent caesarean section after 38 weeks and had birth weight less than 10th percentile. Out of rest others 87% delivered vaginally normally and 9% had caesarean section and 2% had forceps delivery. Majority of babies had birth weight between 2.5 - 3.5 kg.

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