

ROLE OF ULTRASOUND TO DETERMINE FOETAL GESTATIONAL AGE

By

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SUMMARY

It is of paramount importance to determine the gestational age of the foetus in Obstetrics. Ultrasound has an important role to play in the same. With this aim in mind, we at The Nowrosjee Wadia Maternity Hospital studied 400 normal patients who had undergone one random ultrasound examination done antenatally and the results were tabulated according to the time of doing ultrasound. Postpartum a thorough examination of the neonate was done by applying Dubowitz criteria to estimate foetal gestational age. The accuracy of Ultrasound to determine foetal gestational age would be discussed.

Introduction

Precise determination of gestational age antenatally is a boon to the modern obstetrician, especially in context of improved neonatal survival. Conventional means to determine fetal gestational age such as from the first day of the last menstrual period by application of Naegele's law are fraught with errors. Apart from the fact that many women are not sure of their dates, other factors such as menstrual disturbances, lactational amenorrhoea, implantation bleeding, pregnancy following oral contraceptives etc. tend to confuse matters. Furthermore the predictive accuracy of women sure of dates is about three weeks in 90% of the population. Also estima-

tion of gestational age of the fetus by first pelvic examination in women less than 12 weeks pregnant with an anteverted uterus is ± 2 weeks and if the women is obese with a retroverted uterus, the accuracy diminishes to ± 4 weeks. Thus for accurate dating of pregnancies ultrasound can be a great asset.

Study—Methods and Materials

We at the Nowrosjee Wadia Maternity Hospital in Bombay conducted a prospective study of 400 normal pregnant women. Each of these was subjected to one random ultrasonic scan by our sonologists in conjunction with us. All the scans were done on real time Grey Scale linear array and sector with frequencies of 3 MHz and 3.5 MHz respectively. The criteria considered to estimate

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gestational age by the use of ultrasonic scan were:

1st Trimester—Crown Rump Length Measurement.

2nd Trimester—Biparietal Diameter Measurement

3rd Trimester—Femur Length Measurement.

The break up of 400 cases studied was as follows:

TABLE I

Trimester	No. of cases	Parameter Chosen
Ist	42	CRL
IInd	130	BPD
IIIRD	228	FL

A thorough postpartum neonatal examination of the new born was done by Dubowitz Criteria as modified by Ballard *et al* were used wherein six physical and six neurological parameters were considered and scores were assigned to each of them. A tally of these scores was taken and the corresponding gestational age was obtained. The accuracy of these modified Dubowitz criteria in determination of fetal gestational age is 95% with confidence limits of 2 weeks. This has been taken as a standard for comparison in our study.

A comparison was made in between the gestational age obtained with a single random ultrasonic scan and the gestational age of the neonate obtained by application of modified Dubowitz criteria and the difference in the results was noted in each case.

The results, thus obtained become significantly better if one considers the accepted standard deviations of measurement. The measurement of Crown Rump

TABLE I
Sonography Done in 1st Trimester

Difference in weeks	No. of cases	Percentage accuracy
0	40	95.2
1	2	4.8
2	0	—
3	0	—
3	0	—
More than		
Total	42	

TABLE II
Sonography Done in 2nd Trimester

Difference in weeks	No. of cases	Percentage accuracy
0	80	61.5
1	34	26.1
2	14	10.8
3	1	0.8
3	1	0.8
More than		
Total	130	

TABLE IV
Sonography Done in 3rd Trimester

Difference in weeks	No. of cases	Percentage accuracy
0	96	42.1
1	64	28.1
2	38	16.7
3	21	9.2
3	9	3.9
More than		
Total	228	

TABLE V

Trimester of pregnancy	Criterion	Absolute percentage accuracy
Ist Trimester	CRL	95.2
IInd Trimester	BPD	61.5
IIIRD Trimester	FL	42.1

length upto 12 weeks is accurate in dating pregnancies upto five days with a single random ultrasonic scan and upto 3 days if the mean of 3 readings is taken. Measurement of the biparietal diameter upto 25 weeks of pregnancy has confidence limits of ± 7 to 10 days. Measurement of femur length in the third trimester of pregnancy has confidence limits of 2.4 weeks as seen in various studies.

Discussion

Thus it appears that ultrasound is a reliable mode to determine the fetal gestational age accurately, especially in the first trimester of pregnancy. We strongly recommend that every pregnant

woman undergoes a routine ultrasonic scan in the first trimester, not only to date the pregnancy accurately but also as a baseline reading to monitor the growth of the fetus and detect any abnormalities in the same. Even if the woman were to come late in pregnancy and she is not sure of dates, measurement of the biparietal diameter in the 2nd trimester and the femur length in the 3rd trimester would date the pregnancy quite accurately.

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