

Transcerebellar Diameter, a Reliable Parameter to Identify Gestational Age in Second Trimester

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Abstract

Introduction: Gestational age estimation through ultrasonography is a critical aspect for assessing the fetal age. For the assessment various parameters have been used like Biparital diameter, abdominal circumference, head circumference, femur length. Transcerebellar diameter is an additional parameter for the measurement of the accuracy. In our study we assessed the accuracy of transcerebellar diameter in 2nd trimester.

Materials and Methodology: This Prospective cross sectional study was conducted in the Dept of Obstetrics and Gynecology in Government medical college and hospital Akola, Maharashtra between September 2018 to August 2019. This study included 100 antenatal women of gestational age from 14 weeks to 27+6 weeks who attended antenatal clinic in the Dept of Obstetrics and Gynecology, Government medical college and hospital (GMCH), Akola, Maharashtra.

Results and Conclusions: Transcerebellar diameter (TCD) has a linear relationship and it correlates with the gestational age of the fetus with $p < 0.001$. Transcerebellar Diameter in 2nd trimester is a useful new parameter for the estimation of the fetal age along with the other parameters.

Keywords: transcerebellar diameter, gestational age

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I. Introduction

In the era of the ultrasonography there are lot of parameters have come up which can help to identify the correct gestational age of the fetus. But in countries like where most of the women doesn't know their proper gestational age, it is very difficult to find the accurate one (1). Even when the women has regular menstrual cycles, the dates obtained by ultrasonography is accurate than the dates through menstrual cycle (2). To identify proper gestational age many parameters like Crown rump length (CRL), Biparietal diameter (BPD), Head circumference (HC), femur length (FL), abdominal circumference (AC) were derived in days (3). Out of this, one of the new one, Transcerebellar diameter, has found to be accurate one (4) (5). This study was undertaken to evaluate the usefulness of Transcerebellar diameter as a parameter to identify gestational age of the fetus in the second trimester.

II. Materials And Methodology

The study is a prospective cross sectional one that has been conducted in the department of Obstetrics and Gynecology, Government medical college Akola, Maharashtra, from August 2018 to July 2019. The samples for the study included pregnant women of gestational age 14 to 28 weeks who attended antenatal clinic at the department of Obstetrics and Gynecology, Government medical college Akola. Totally 100 samples have included in this study.

INCLUSION CRITERIA

Women who have correct LMP, regular cycles, singleton pregnancy with first trimester scan and willing to participate in the study

EXCLUSION CRITERIA

All High kind of risk pregnancies

MEASUREMENTS

All the patients were examined in supine position with a curvilinear array real time B mode ultrasonography machine samsung RS80A USG color doppler machine. BPD, HC, AC, FL were measured along with TCD. BPD was measured from outer to inner margin of calvarium in a fetall axial image at the level of thalamic pairs, third ventricle and cavum septum pellucidum.

HC was measured from the outer edge of the skull on the same trans axial view of the fetal head

AC was measured on an axial image of the fetal abdomen at the level of stomach and intrahepatic portion of the umbilical vein.

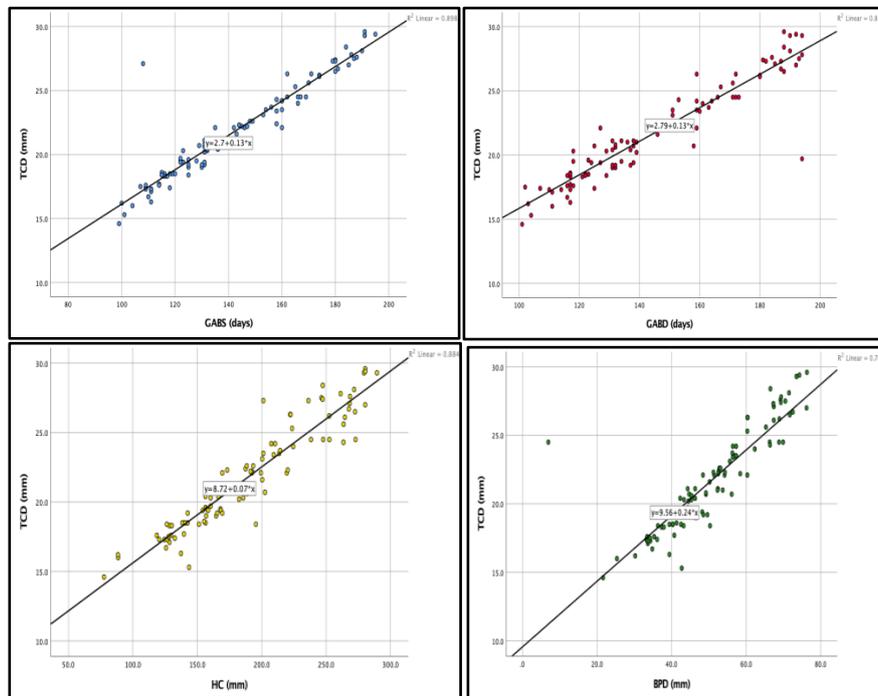
FL was measured at the either end of the ossified femur diaphysis

TC was measured by transverse view of fetal cranium visualising midline thalamus, cerebellar hemisphere and cisterna magna in the posterior fossa.

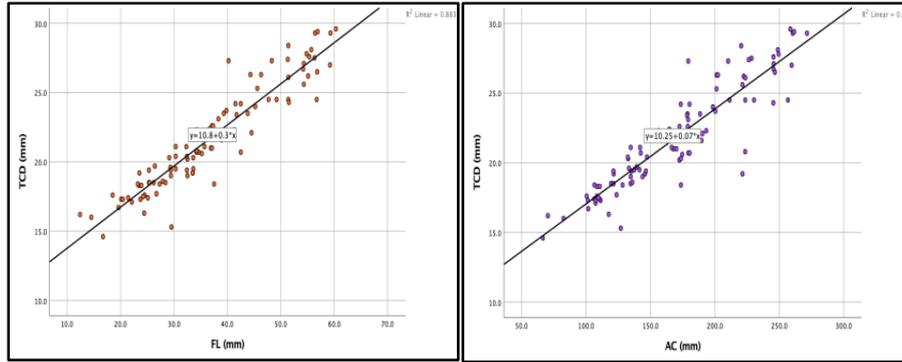
III. Results

All the 100 samples shows a good correlation between TCD and all the other parameters, BPD, HC, AC, FL. The parameters also established a strong correlation with GA by 1st trimester scan and by date and TCD demonstrated a best correlation with GA. Scattered diagrams were derived and showed the relationship between GA obtained by 1st trimester scan with other parameters and TCD. From the analysed data, nomograms were obtained for BPD, HC , AC, FL , TCD which states the correlaton for TCD with the GA obtained through 1st trimester scan is very strong.

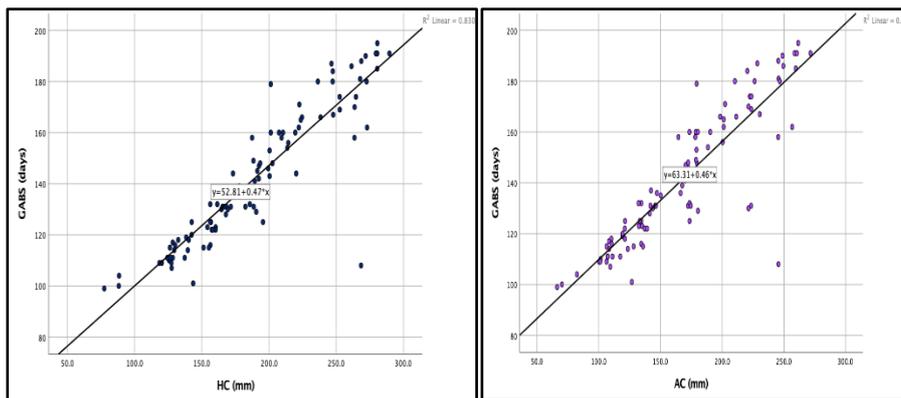
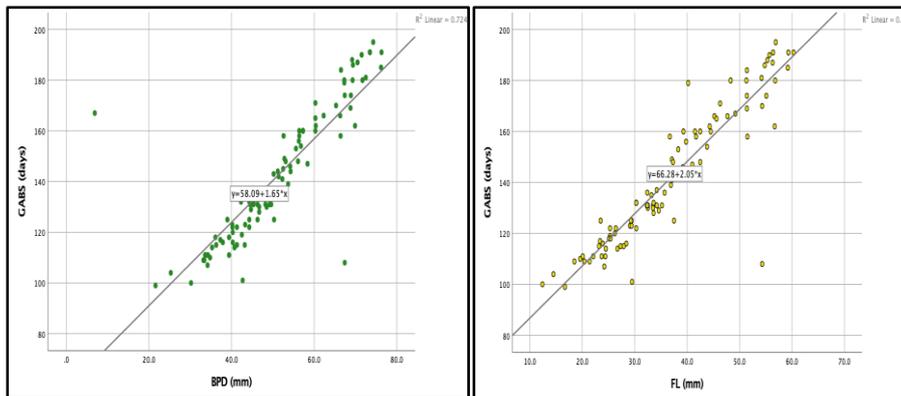
S.NO	Parameters compared	Correlation 'r'	P- Value
1	TCD vs GABD	0.940	< 0.001
2	TCD vs GABS	0.947	< 0.001
3	TCD vs BPD	0.873	< 0.001
4	TCD vs FL	0.940	< 0.001
5	TCD vs HC	0.940	< 0.001
6	TCD vs AC	0.911	< 0.001



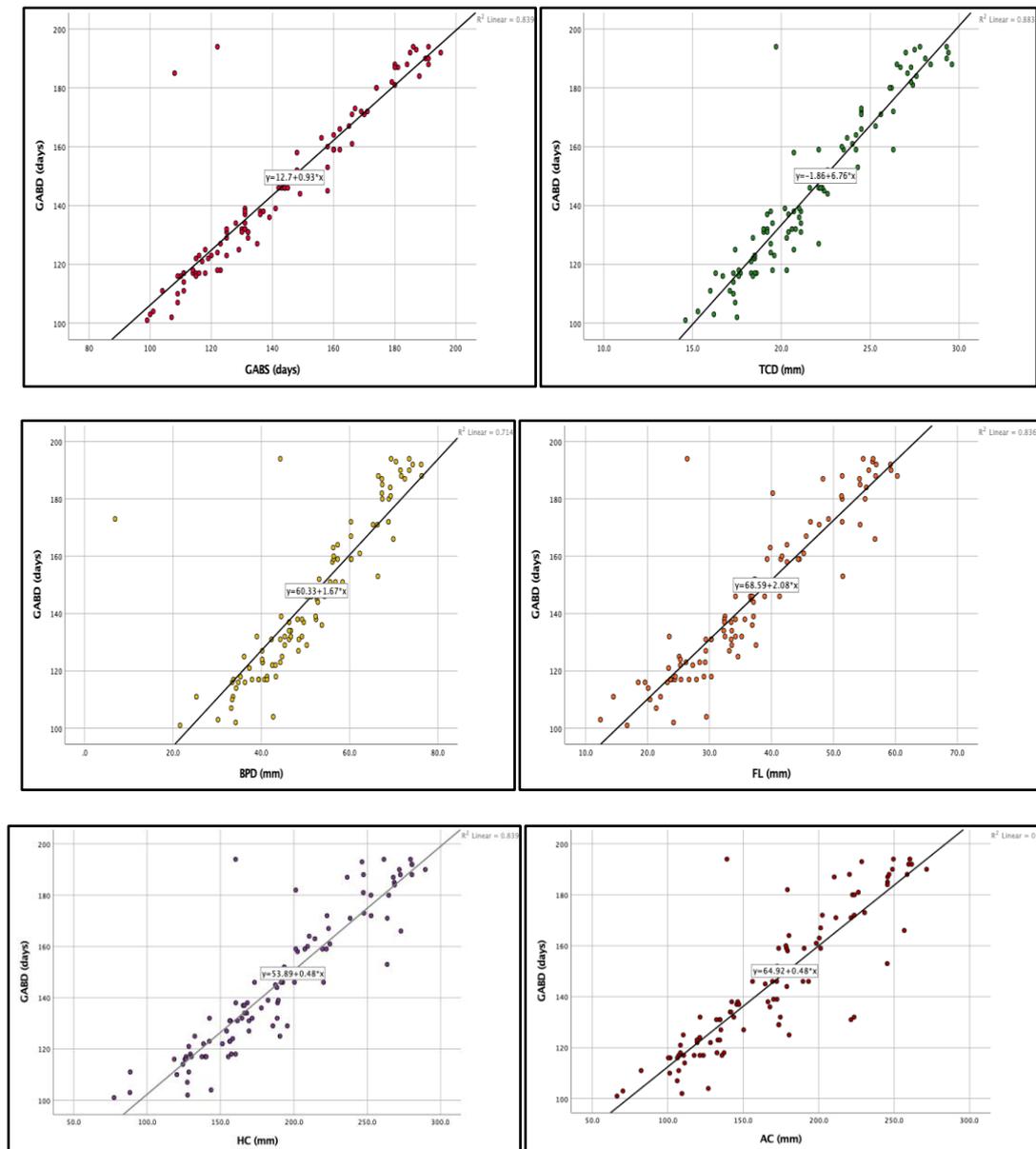
Transcerebellar Diameter, A Reliable Parameter To Identify Gestational Age In Second Trimester



S.NO	Parameters compared	Correlation 'r'	P- Value
1	GABS vs TCD	0.947	< 0.001
2	GABS vs BPD	0.851	< 0.001
3	GABS vs FL	0.920	< 0.001
4	GABS vs HC	0.911	< 0.001
5	GABS vs AC	0.882	< 0.001



S.NO	Parameters compared	Correlation 'r'	P- Value
1	GABD vs TCD	0.940	< 0.001
2	GABD vs BPD	0.845	< 0.001
3	GABD vs FL	0.914	< 0.001
4	GABD vs HC	0.916	< 0.001
5	GABD vs AC	0.884	< 0.001



IV. Discussion

Faiza Naseem, Naheed Fatima, Shakeela Yasmeen and Saima Saleem et al (6) compared the accuracy of identifying gestational age using transcerebellar diameter and bipareital diameter. They found although both BPD and TCD are accurate biometric parameters at 36 weeks of gestation, transcerebellar diameter is more reliable method of gestational age determination in third trimester of pregnancy than biparietal diameter. TCD can be used as a tool to assist in the assessment of gestational age in third trimester which corresponds to our

Anirban Das Gupta, Arindom Banerjee, N Rammurthy, P Revati, Josna Jose, P. Karak, Anil Kumar et al (7) demonstrated a strong relationship between TCD and gestational age indicating TCD is a good marker for estimation of gestational age.

A. A. Adeyekun et al (8) compared the predictive accuracy of fetal trans-cerebellar diameter(TCD) with those of other biometric parameters in the estimation of gestational age [GA] among pregnant Nigerian African females. The result of the study suggestive of TCD has a stronger predictive accuracy for gestational age compared to other routinely used fetal biometric parameters which is also corresponding to our study.

Cletus Uche Eze, Innocent Ubaka Onu, Adekunle A. Adeyomoye, Ernest Ruto Upeh et al (9) studied accuracy of TCD in late stages of pregnancy in population of healthy pregnant women of Igbo ethnic origin living in Oshodi, Lagos State, Nigeria, the sonographically measured TCD was more accurate as a single estimator of GA than BPD, HC, AC, and FL in the late stages of pregnancy which correlates with our study.

Callens ultrasonography of obstetrics and gynecology 6th edition(10) also concludes that the gestational age of the fetus in the 2nd trimester exactly correlates to the gestational age of the fetus which was proved in our study too finding linear relationship between gestational age of the fetus and the 2nd trimester transcerebellar diameter.

V. Conclusion

In countries like india where people forget their LMP, new parameters like transcerebellar diameter help to get accurate value of gestational age of the fetus. Since transcerebellar diameter gives accurate value of gestational age in 2nd trimester it can be useful even if the women comes for scan directly in 2nd trimester along with BPD.

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