Clinically useful fetal growth charts: Is it the time to modify all available fetal growth charts?

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Objectives: To prepare useful fetal biometry and growth curves for clinical use for diagnosis of fetal problems and management.

Methods: 11567 patients were included in the present study to measure BPD, HC, AC, FL and expected fetal weight. Statistical analysis has been performed using MS excel 2010. Data analyzed as recommended by Altman, Chitty and Royton. For each measurement, polynomial regression models were fitted separately to estimate the mean and standard deviation (SD) as functions of gestational age. For BPD and HC, 1st, 5th, 50th and 95th centile curves require $k = -2.326, -1.645, +1.645$ between 24 to 40 weeks developed. For AC 1st, 3rd, 10th, 50th, 90th, and 99th centile curves require $k = -2.326, -1.96, -1.282, +1.282, +1.960 and +2.326$. For FL 1st, 5th, 50th, 95th centile curves require $k = -2.326, -1.645, +1.645, +1.965$. The SD was modeled via the absolute residuals from the regression to estimate the mean. Assuming that at each gestation, the measurements have a normal (Gaussian) distribution, with mean and standard deviation, and that both vary smoothly with gestational age, Centile curve is calculated using the formula. Regression equation were derived with polynomial regressions where $R$ value is closure to 1.

Each of the fetal measurement has different centiles for abnormalities and management may be different. FL for normal population will fall between 5th to 95th centile. Below 5th centile possibility of short femur and skeletal dysplasia, which can be differentiated by <1 centile or between 1 to 5th centiles. Similar way, now management of FGR is also based on centile growth <3 or >3 centile to detect severe FGR fetuses. Microcephaly below 1st centile.

So we have developed as per the fetal conditions associated newer version of fetal growth curves.

Conclusions: These charts will be more useful in day today clinical practise for fetal diagnosis, like skeletal dysplasia, grading FGR and microcephaly especially.