Customized Indian biometry of the height of fetal cerebellar vermis by 2D ultrasound

Prashant Acharya, Viral M. Pandya, Vijay Patil, Smita Punia, Dhara Pandya, Rini Sutaria
Paras Advanced Centre for Fetal Medicine, Ahmedabad, Gujarat, INDIA

Objective
The aim of this study was to develop customized reference ranges for the height of the fetal cerebellar vermis between 19 to 32 weeks of gestation for the Indian population from a prospective cross-sectional study.

Method
Total sample size = 166. Each fetus was examined only once. High resolution 2D images of mid-sagittal plane of fetal brain were obtained by transvaginal ultrasound. Size of cerebellar vermis was measured directly from a magnified view using 0.1 mm resolution. Vermis height was defined as maximum distance between most cranial portion of culmen & most caudal portion of uvula. Regression equations for mean and SD values were generated from dataset. Using mean and SD values for each gestational age, fitted centiles were created for height of the vermis.

Results
Cerebellar vermis height increases in a linear fashion between 19 and 32 weeks, with the mean length doubling from 9.6mm at 19 weeks to 19mm at 30 weeks. Imaging of the vermis is part of the protocol of the targeted anomaly scan at 20 weeks of gestation.

Conclusion
As a result of technological advances, the high resolution CNS imaging possible by transvaginal ultrasonography provides an excellent method for direct examination of the fetal vermis.

With this study, we have generated reference ranges for measurement of height of fetal cerebellar vermis. This data can be used for the assessment of normal brain development, as well as for suspected fetal CNS defects. As per our knowledge, ours is the first study to publish population specific reference ranges for the measurement of the height of fetal cerebellar vermis in the Indian population.

According to convention, if we consider dimensions below 5th centile to be indicative of vermian hypoplasia, our data suggests a cut-off of 8mm at 20 weeks for the vermis to be labelled as hypoplastic.