

Routine examination of fetal posterior fossa in transverse section at 11 – 14 weeks

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Objective

The aim of our study was to find an easy, reproducible method of examining the posterior fossa accessible to all sonographers trained in nuchal translucency (NT) scans.

Methods

Between January 2017 – March 2018 we have selected 132 consecutive singleton pregnancies presenting to our unit for first trimester screening. During the routine fetal examination at 11 – 14 weeks we have included an oblique transverse section of the fetal head with visualization of the posterior fossa. This section is part of a sweep of the fetal head that starts at a level above the choroid plexuses and continues with the examination of the fetal face structures. On the posterior fossa transverse section we have measured the cisterna magna (CM) and the fourth ventricle antero-posterior diameter. In 82 fetuses we had a follow-up scan at 18 – 24 weeks and we searched for a predictive relationship between first trimester measurements of CM and fourth ventricle and second trimester measurements of CM and transverse cerebellar diameter (TCD).

Results

We have established the normal range for CM and fourth ventricle at 11 – 14 weeks according to crown-rump measurements (CRL). The 50th centile for CM ranges from 1.2 mm to 2.3 mm at a CRL between 45 and 85 mm. The 50th centile for fourth ventricle ranges from 1.8 to 2.4 mm. Pearson r coefficient indicated a positive correlation between first trimester and second trimester CM diameter and between first trimester fourth ventricle and second trimester TCD. There is an inverse correlation between first trimester CM and second trimester TCD. None of the correlations is statistically significant.

Conclusion

The measurements of the different components of the posterior fossa in the first trimester cannot predict measurement of CM and TCD in the second trimester. In our experience, in the first trimester the morphology of the posterior fossa is a better diagnostic tool for different pathologies. The presence of the three hypochoic structures (cerebral peduncles, fourth ventricle and CM) separated by 2 hyperechoic lines is easy to see and can rule out many brain and spinal anomalies, as well as chromosomal anomalies.