

Added clinical value of fetal brain magnetic resonance after a systematic neurosonography in congenital heart defects

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Objective

Use of magnetic resonance (MR) in fetuses with congenital heart defects (CHD) has been proposed to improve the assessment of brain development in-utero. However there is no data about the usefulness of this technique in selected population. Our objective was to evaluate the added value of fetal brain MR after systematic neurosonography (NSG) in fetuses with CHD in the diagnosis of fetal brain abnormalities.

Methods

Prospective observational study including 60 fetuses with isolated CHD. Exclusion criteria were evidence of structural brain malformations at the moment of diagnosis, abnormal array-CGH, and perinatal infections. Patients were evaluated by systematic NSG at 32±2 weeks and MR at 36±2 weeks and all cases were classified according to the existence of brain abnormalities in both examinations. Prenatal findings were confirmed postnatally.

Results

Mean gestational age at NSG was 33.5±1.6 weeks and at MR 36.1±1.2 weeks. In 70% (n=42) of cases NSG was considered as normal, and of those in 92.9% MR completely agree with the diagnosis. The three cases with discordant classification were two connatal cysts and one case of enlarged subarachnoid space, all of them without clinical relevance in postnatal outcome. On the other hand, in 30% of cases (n=18) NSG were abnormal, being confirmed by MR in 55.5% of cases (n=10). Those cases that were not confirmed included 6 cases of corpus callosum length <5th centile, one ventricular asymmetry and one quadrigeminal cyst. In summary, NSG has a sensitivity of 76.9% and a specificity of 82.9%, with a negative predictive value of 92%. All severe brain abnormalities including corpus callosum anomalies, abnormal cortical development and pontocerebellar hypoplasia were identified by NSG.

Conclusion

In centres with specialized NSG unit, MR would not add a clear benefit as a routine procedure in fetuses with CHD and normal NSG assessment. MR may be of help as a complementary examination in patients with incomplete NSG evaluation or with suspected abnormality.