The clinical value of ultrasound screening for CHD during the first-trimester pregnancy

Jingwen X, Weijing L, Ruiling Y, Xueqin W
Department of Fetal Medicine, First Affiliated Hospital of Jinan University, Guangzhou, China

Objective
To investigate the clinical values of ultrasound screening for fetal CHD during the first trimester.

Methods
In this study, we included 7639 pregnant women who had their first trimester combined screening test for Down’s syndrome at 11-13 weeks of gestation in our hospital. The FMC certified doctors assessed fetal NT, DV a-wave, TR and fetal heart in the 11-13 weeks scan. If existing risk factors, fetal echocardiography was performed at 16-18 weeks by our fetal cardiologist. All subjects underwent at least one fetal morphological US examination at second or third trimester. All fetuses diagnosed with cardiac malformations had karyotyping and all were followed up until TOP or 6 months after birth.

Results
(1) The heart appeared to be abnormal in 21 cases in the first trimester scan, another 7 cases were diagnosed in the 2nd trimester. The CHD detection rate was 75% (21/28) and the detection rate for severe cardiac abnormalities was 100% (10/10). 7 fetuses with diagnosed CHD were found to have additional heart defects at the postnatal follow-up examination including single ventricular septal defects (5 cases), mild pulmonary valve stenosis (1 case), and one mild downward displacement of tricuspid valve (1 case). All of the missed diagnosis of CHDs were followed up to 6 months after delivery and they did not need surgical treatment. (2) In the group of fetuses with CHD, increased NT (≥3.5mm), reversed a-wave in the DV, or TR were observed in 42.9% of cases, 39.3% and 28.6% respectively; whereas in those without cardiac defects they were found in 6%, 1.1%, and 6% respectively (p<0.05). (3) 18/28 (64.3%) cases of the CHD group presented with at least any of the three markers (increased NT, reverse a-wave in the DV or TR).

Conclusion
A trained obstetrician can assess the fetal heart at 11–13 weeks with a high degree of accuracy. The performance of NT, DV, and TR for screening of CHD showed a detection rate of about 64%.