Estimation of the detection rate of cardiac defects in the first trimester after including the outflow tract views

Chappidi S, Shettikeri A, Radhakrishnan P
Bangalore Fetal Medicine Centre, Bangalore, India

**Objective**
To estimate the detection rate of cardiac defects in the first trimester after including the outflow tract views (‘X’ and ‘Y’ sign).

**Methods**
We included all the major cardiac defects detected prenatally and postnatally from April 2008 – February 2017. We did a retrospective analysis of our data and included the fetuses who had first trimester screening at our center. Till 2013, we were using only the 4CH view as a screening method for cardiac defects. We checked for any improvement in the detection rate after the introduction of the visualisation of the outflow tract with the ‘X’ and ‘V’ signs in the first trimester cardiac screening scan, “X: sign signifies crossover and V” sign signifies 2 outflows on Colour Doppler. We divided them into two groups. Group 1 – Cardiac screening done before 2013 where only four chamber view was used as screening method. Group 2 – cases after 2013, where we incorporated X and V sign in our cardiac screening. We mainly tried to concentrate on the detection rate of major conotruncal abnormalities in the first trimester in this study.

**Results**
The study group included 7977 women with singleton pregnancies who underwent cardiac screening in the first trimester. Multiple fetal defects and multiple pregnancies were excluded from the study. The total number of cardiac defects detected in the first, second, third trimester and postnatally were 89 (1.11%) in total. 51 (57.3%) of them were detected in the first trimester, 27 (30.3%) in the second trimester and 11 (12.3%) were postnatal detections. There were 17 cardiac defects diagnosed in the first trimester in the first part of the study (before 2013), when only four chamber view was used as a screening method. The defects included, 7 Mitral atresias, 6 AVSDs, 3 Tricuspid atresias, 1 TGA and only one was a conotruncal abnormality. 16 cardiac abnormalities were diagnosed in the second and third trimesters who have had a first trimester cardiac screening with us. They included 2 AVSDs, 2 cardiac arrhythmias, 1 pulmonary stenosis, 1 Tricuspid dysplasia, 1 Rhabdomyoma, 1 Atrial Septal defect, 1 VSD, 4 TOF, 2 TGA, 1 CAT. Therefore, we missed 78 (87.5%) conotruncal anomalies in the first trimester in the first group. In the second group, which included the cases after 2013, when we started looking at the outflow tracts as well, we diagnosed 34 cardiac defects in the first trimester and 28 of them were diagnosed in the four chamber view. They included 16 AVSDs, 7 Mitral Atresias, 5 Tricuspidic atresias. In addition, we detected 6/10 major conotruncal abnormalities (4 TGAs, 1 CAT, 1 Absent Pulmonary valve). 10 major cardiac abnormalities are detected in the second and third trimester. They were 3 Ebstein’s anomalies, 2 Tricuspid dysplasia, 1 AVSD, 1 TGA, 1 TOF, 2 Arch hypoplasias. Hence, we were able to diagnose 60% of the major conotruncal abnormalities. 11 (12.3%) cases were postnatal detections. The cardiac defects diagnosed postnatally were 5 VSD, 1 ASD with PDA, 2 ASD with VSD, 3 ASD. We had 13 (14%) karyotypic abnormalities in the whole cohort. About 56% of them had increased NT as a marker and 22% had TR and reversed DV.

**Conclusion**
The addition of the 2 outflow tracts as shown by “X-sign” and the “V” signs to the initial basic cardiac examination in the first trimester increased the detection rate of cardiac defects including the conotruncal abnormalities. Absence of these signs should raise suspicion of a cardiac defect and should lead to further, more detailed examination of the heart as well as an earlier second trimester scan to confirm the diagnosis if needed.