The 22q11 microdeletion syndrome: A review of prenatal ultrasonographic findings and the relation with diagnostic prenatal testing

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Objective
The 22q11 deletion syndrome is the most common human microdeletion syndrome with an incidence of one in 2000 to 7000 live births and also known as DiGeorge and Velocardiofascial syndrome. These disorders are overlapping syndromes and are defined as the disease of the same gene defect. The del22q11 syndrome is associated with a highly variable phenotype despite the uniform point mutations in the TBX1 gene and is often diagnosed with fluorescence in situ hybridization (FISH). Congenital heart disease is reported with an estimated high rate of 74%, conotruncal anomalies being the most detected ones.

Methods
There were 26 cases with confirmed 22q11 deletion identified between 2010 and 2016.

Results
Mean gestational age was 22 weeks (min 17-max 31 ws). Tetralogy of fallot (n=12, 46%) was the most detected heart defect of 26 cases, and other defects included 15% (n=4) RAA, 0. 07% (n=2) aort coarctation, 0. 07% (n=2) truncus arteriosus, respectively. In 2 cases, aberrant right subclavian artery (ARSA) was the only detected heart defect, and in another 2 cases no congenital heart defect was diagnosed. Prenatal diagnosis was confirmed by FISH only in 61. 1% (n=16) of all cases. In 2 cases, karyotyping and FISH results were normal and the diagnosis confirmed by array CGH. Detected mutations in fifteen cases were de novo, however in only one case, a 22q11 deletion of maternal origin was identified. In this case, the mother’s other son was diagnosed 22q11 deletion syndrome after the current pregnancy. Mild hydronephrosis (n=4), polyhydramnios (n=4) and thymus aplasia/hypoplasia (n=10) were the most detected additional ultrasonographic findings. A half (n=13) of all cases were TOP, and 23% (n=6) were live birth. Pregnancy outcomes in 23% (n=6) of all cases are unknown due to lost to follow-up.

Conclusion
Our results may suggest that, when ARSA is detected as an isolated fetal echocardiographic finding, it may justify investigation for 22q11 microdeletion syndrome, and not only aneuploidy. Array CGH may have diagnostic sensitivity superior to that of FISH in fetuses with congenital heart disease associated with del22q11 syndrome.