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Fetal Aortic Arch Variants: Left or Right matters!

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Introduction. Following improvements in routine anomaly ultrasound heart imaging, a greater number of **aortic arch (AA) abnormalities** is expected to be detected. The clinical impact of this remains to be determined.

Methods

•**Retrospective study** of **3,414 fetal echocardiogram (FE)** records of a tertiary academic referral centre (2008-2107) regarding:

1) **antenatal diagnosis of AA variants**, including combinations of right aortic arch (RAO) with/or without aberrant left subclavian artery (ALSCA), retroesophageal ductus arteriosus (rPDA), double aortic arch (DA) and left aortic arch (LAO) with aberrant right subclavian artery (ARSCA)

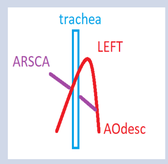
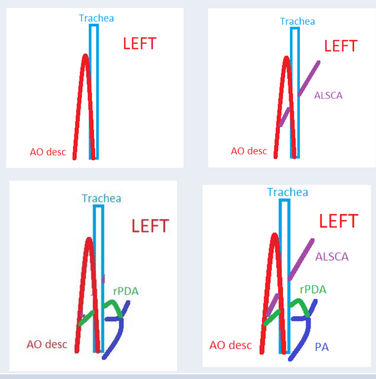
2) AA diagnosis **prior or following FE**,

3) **isolated (ISO) or associated with congenital heart disease (CHD)**

4) **karyotype** abnormalities

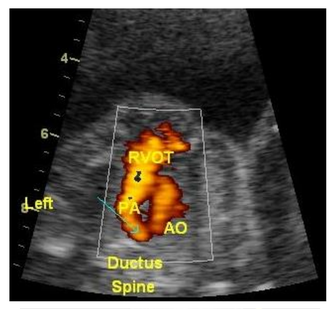
5) **Nuchal Translucency (NT)** findings,

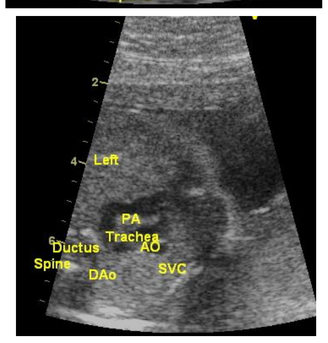
6) postnatal **outcome**

Arch Side	Associated abnormality	Abbreviation	Graphic
Left LAO	• Aberrant right subclavian artery	ARSCA	
Right RAO	• No • Aberrant left subclavian artery • Retroesophageal Ductus • Both	ALSCA rPDA ALSCA-rPDA	
Double DA			

Results

- **52 pregnancies**, median GW: 23 week (18-35), maternal age: 30,4yrs (20-44), IVF (n=6) were included.
- In **20 (38%) the AA variant** was **first detected during FE** (ISO n=15), corresponding to isolated AA variant as new finding 0.44% (1 in 227).
- **34 (65%)** were **isolated defects**: ARSCA-LAO (n=15), RAO (n=1), DA (n=1),RAO-ALSCA (n=2), RAOALSCA-rPDA (n=8), RAO-rPDA (n=7).
- **18 (35%)** were **CHD-associated**: ARSCA-LAO (n=6), RAO (n=1), RAO-ALSCA, RAO-ALSCA-rPDA, RAO-rPDA, a single case each. Associated CHD (n=18, 35%) included VSD (n=6), ToF (n=5), suspected CoA (n=4), TrA, PAtr.-VSD, PS, a single case each.
- **Abnormal NT-values (14%), fetal malformations (10%), abnormal Karyotype (12%**, Di George n=2) were documented.
- The **side of aortic arch** (RAO vs LAO-ARSCA) and **the presence of CHD** (ISO vs CHD) had **a weak (non-significant) association** with the probability of **abnormal karyotype, abnormal NT, fetal malformation and postnatal outcome** (Table) .





RAO-rPDA in Power Doppler and 2D Fetal Echocardiography

AA variant	Abnormal Karyotype	Abnormal NT	Fetal Malformation	Feeding Problems	Feeding- operation
ISO- RAO (n=19)	2/16 (12%)	4/14 (22%)	1/18 (6%)	2/8 (25%)	1/8 (12%)
ISO-ARSCA (n=15)	0/13 (0%)	1/13 (7%)	1/15 (7%)	1/9 (11%)	0/9 (0%)
CHD-RAO (n=12)	2/9 (22%)	1/10 (10%)	3/11 (27%)	0/7 (0%)	0/7 (0%)
CHD-ARSCA (n=6)	1/5 (20%)	1/6 (14%)	0/7 (0%)	1/3 (33%)	0/3 (0%)

Conclusions

Isolated **left aortic arch variants (ARSA)** might have a **weaker association** with fetal **karyotype abnormalities** and **better outcome** compared to **right arch variants** or ***those associated with CHD***

Authors declare that there is no conflict of interest