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Prospective study for antenatal diagnosis of coarctation of the aorta

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The objective of this study was to define echocardiographic (ECHO) parameters during fetal life, to predict postnatal aortic coarctation (COA).

Material and Methods: This prospective single-center study from 2010 to 2018 included all fetus diagnosed with isolated ventricular and/ or great vessels asymetry (right heart dominance). Complex CHD were excluded. The cohort was divided in patients with coarctation after birth (COA) and those free from coarctation (noCOA). Left heart, aortic and ductus measurements were collected serially at second trimester (T2), third trimester (T3) ad Z-scores were assessed. COA and noCOA were compared, sensitivity (Se) and specificity (Spec) and ROC curves (cut-off values) were assessed for each parameter.

Results: 67 cases were included: 34 (50.7%) ranged in group COA and 33 (49.3%) in noCOA. Coarctation occurred more frequently if suspected at T2 (70.6% in COA vs 30.3% in noCOA, p= 0.001). Mitral annulus (T3) was 8.6mm in COA vs 10.3mm in noCOA (p= 0.002) with cut-off < 7.3mm (Se= 50%, Spec= 93.6%, OR= 14.5). Aortic annulus diameter (T3) was 4.8mm in COA vs 6mm in noCOA (p= 0.005), with cut-off < 5.4mm (Se= 65%, Spec= 77%, OR= 6.3). Aortic isthmus diameter (T3) was 1.4mm in COA vs 2.8mm in noCOA (p= 0.003), with cut-off < 3mm (Se= 91%, Spec= 65%, OR= 18.9). Ductus arteriosus/ aortic isthmus ratio (T3) was 2.5 in COA vs 1.8 in noCOA (p= 0.01) with cut-off > 1.57mm (Se= 90.5%, Spec= 62%, OR= 15.4).

Conclusion: Mitral annulus < 7.3mm, aortic annulus < 5.4mm, aortic isthmus < 3mm and ductus/isthmus ratio > 1.57 assessed during 3rd trimester of fetal life may help to predict postnatal coractation of the aorta. These results have to be confirmed by larger prospective studies.