Assisted reproductive technologies and fetal cardiovascular remodeling persistence: a follow up study

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Objective
Assisted reproductive techniques (ART) have been associated to cardiovascular remodeling and dysfunction in fetal life. Our aim was to evaluate the postnatal persistence of these cardiovascular changes at 3 years of age.

Methods
A cohort study including 60 children conceived by ART and 60 naturally conceived children (controls). Cardiovascular evaluation was performed at 3 years of age including echocardiography, measurement of blood pressure and carotid intima-media thickness (cIMT) by ultrasound.

Results
As compared to controls, children conceived by ART showed more globular hearts (right ventricular sphericity index: control mean 1.8 (SD 0.5) vs. ART 1.6 (0.2) p<0.001) and larger atria (right atrial area: control 4.9 cm² (0.9) vs. ART 5.5 cm² (0.9) p<0.001) with signs of systolic (tricuspid annular plane systolic excursion: control 18 mm (2) vs. ART 16 mm (3), p<0.001) and diastolic dysfunction (isovolumic relaxation time: control 68 ms (12) vs. ART 79 ms (12), p<0.001). ART children also presented increased systolic blood pressure (mean controls 90 mmHg (6) vs. ART 94 mmHg (5), p<0.003) and cIMT (control 0.52 µm (0.14) vs. ART 0.60 µm (0.16), p<0.001).

Conclusion
Cardiovascular changes previously reported in ART fetuses persist at 3 years of age, opening opportunities for early diagnosis and interventions to improve cardiovascular health in these children.