Cardiac remodeling in fetuses conceived following natural cycle IVF versus conventional IVF

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Objective
Cardiac remodeling and dysfunction have been demonstrated in fetuses conceived through in vitro fertilization (IVF) following conventional stimulated IVF. Ovarian stimulation might potentially impact on oocyte quality and endometrial milieu that may affect perinatal results. Our aim was to compare cardiac morphometry and myocardial performance index (MPI) in fetuses conceived following conventional stimulated IVF with those obtained after unstimulated natural cycle IVF (NC-IVF).

Methods
Prospective cohort study of 102 singleton pregnancies including: 34 spontaneously conceived from fertile couples, 34 following NC-IVF and 34 after conventional stimulated IVF with fresh embryo transfer, matched by maternal age, ethnicity and gestational age at scan. Fetal echocardiography was performed at 29-33 weeks. Comparisons between groups were adjusted by gestational age and fetal weight at scan, and birthweight centile.

Results
Overall, as compared to the fertile, both IVF groups showed significant signs of fetal cardiac remodeling: larger right atria-to-heart ratio (conventional-IVF 19.1% [3.2] vs NC-IVF 18.2% [3.3] vs fertile 17.2% [2.9], adjusted P-value <0.001) increased relative wall thickness (conventional-IVF 0.83 [0.24] vs NC-IVF 0.85 [0.3] vs fertile 0.72 [0.3], adjusted P-value<0.001) and suboptimal function (MPI: conventional IVF 0.50 [0.07] vs NC-IVF 0.48 [0.08] vs fertile 0.47 [0.08], adjusted P-value<0.001), with more pronounced changes in the conventional IVF group.

Conclusion
Fetuses conceived following IVF showed signs of cardiac remodeling as compared to the fertile group, even in NC-IVF with absence of ovarian stimulation. These results underscore the importance of future studies for assessing the long-term cardiovascular health in fetuses conceived following IVF.