Reviewer's report

Title: Prenatal screening of fetal ventriculoarterial connections: benefits of 4D technique in fetal heart imaging

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Reviewer: Vita Zidere

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Authors have attempted to describe a method of fetal cardiac assessment during routine ultrasound examination. It is certainly congratulable but I have reservations which I have stated below.

In Background:

Recent published data has shown that the incidence of CHD is higher than authors mentioned 0.6% (0.8-10%) per life birth.

In Methods:

Authors should clarify what they meant by "All fetuses complicated with ventricular septal defect (VSD)" when talking about tetralogy of Fallot and common arterial trunk. Is it not expected to have VSD in these conditions? Double outlet right ventricle has a very broad spectrum. Hence, clarification is needed which forms of DORV were included in this study.

Maternal age is mentioned, what is the relevance for this study?

In Data sheet analysis and Discussion:

There is some confusion over the description of anatomy of cardiac lesions in this paragraph: "Morphologically, the difference of DORV from TOF lies in that both a subaortic and subpulmonic muscular conus could be identified in DORV. As the study aimed to propose a 4D modality to rule out fetal CTA anomalies by screening sonographers, the definition of TOF in the study was a large malaligned VSD, overriding of aorta over the VSD (<75%), and stenosis pulmonary artery. DORV was defined as one complete arterial trunk and at least 75% of the
other arterial trunk emerge from the right ventricle. When only one great artery was identified arising from the ventricles, the fetus was suspected as TCA, whether the pulmonary artery arising from the aorta could be visualized or not.

There is not entirely correct definition either for DORV or CTA. If the authors aim for "simplified" approach that it is all meaningless if sonographers have been asked to distinguish normal from abnormal only. Otherwise there should be precise definition of abnormalities used. It is not good enough to call common arterial trunk if no effort to delineate pulmonary artery branches has been shown.

Results: Authors have described high detection rate using 4D data sheet analysis at second trimester 18-28 weeks and much poorer results in third trimester. There is no clear explanation why as this method should be universal for both gestations. Most important part, comparison with conventional 2D imaging is missing. Authors refer to previously published papers on low detection rate of certain forms of CHD but there is no real prove that STIC method is superior to conventional 2D sweep in this study. Authors mention that STIC is novel method but actually it has been around more than a decade. It has been proved than additional tool to 2D but not a replacement due to many reasons including fetal movement and poor quality of acquired data sheets which can preclude from remote analysis of the data.

Authors have overlooked published article by Zidere et al. "Three-dimensional fetal echocardiography for prediction of postnatal surgical approach in double outlet right ventricle: a pilot study" which gives a relevant inside of anatomy and difficulties of diagnosis of DORV.

Input of paediatric cardiologist is much needed as well as English language revision.

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Not suitable for publication unless extensively edited
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