19th World Congress in Fetal Medicine

Reproducibility of 4D-Spatio Temporal Image Correlation (STIC) in the assessment of the fetal heart using FetalHQ®

Mula C, Nogué L, Gómez O, Izquierdo N, Masoller N, Devore G, Martínez-Crespo JM, Gratacós E, Crispi F, Bennasar M.
BCNatal, Hospital Clínic de Barcelona, Barcelona, Spain

Objective

To evaluate the feasibility and reproducibility of 4D-Spatio Temporal Image Correlation (STIC) speckle tracking echocardiography (STE) using FetalHQ®.

Methods

We conducted a prospective study including 31 low-risk singleton pregnancies between 20 and 40 weeks of gestation. Basic fetal ultrasound excluded cardiac or extracardiac anomalies. 4-chamber view volumes with apex pointing 45º and a frame rate higher than 60Hz were acquired. Speckle tracking analysis was performed using FetalHQ® and endocardial border was tracked semi-automatically. Functional and morphometric echocardiographic parameters were obtained. Intra- and inter-observer reproducibility were assessed by the intraclass correlation coefficient (ICC). A learning curve of 20 fetuses was carried out previous to the study.

Results

Speckle tracking analysis was achieved in all 31 4D-STIC volumes and mean frame wate was 107Hz. 4D-STIC specle tracking echocardiography is highly reproducible (ICC>0.900) for morphometric evaluation including biventricular area, longitudinal and transverse diameters. Reproducibility is also good (ICC>0.800) for functional evaluation (biventricular strain, Fractional Area Change, left ventricle volumes, ejection fraction, cardiac output). On the contrary, reproducibility shows low results (ICC <0,800) for the study of the sphericity index and shortening fraction of the different ventricular segments.

Conclusion

According to these data, 4D-STIC is feasible and reproducible for the assessment of cardiac morphometry and function. Further studies are required in order to validate these results including a larger population and adding fetuses with cardiac or extracardiac anomalies.