Placental perfusion assessed by MR IVIM model and its correlation with placental volume in pregnancies near term complicated by fetal growth restriction

Nakaki A1, Crovetto F1-3, Vellve K1, Basso A1, Paules C1, Eixarch E1-3, Munuera J4, Crispì F1-3, Gratacós E1-3

1BCNatal | Fetal Medicine Research Center (Hospital Clinic and Hospital Sant Joan de Déu), University of Barcelona, Barcelona, Spain
2Institut d’Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS), Barcelona, Spain,
3Centre for Biomedical Research on Rare Diseases (CIBER-ER), Madrid, Spain
4Diagnostic Imaging Department, Hospital Sant Joan de Deu, Barcelona, Spain.

Aim
Assess placental perfusion by MR-IVIM and its correlation with placental volume and feto-placental Doppler in pregnancies complicated by FGR compared to normally growth fetuses.

Methods
Prospective study, FGR=EFW<10th centile at birth

- 29-34 wks
- 36-38 wks

Ultrasound
EFW, UA, MCA, UtA

3T-MRI
T2WI, DWI (10 b-values)

Off-line analysis for IVIM (f, D) and placental volume
(ivim.sav - Fiji software)

Results
13 FGR vs. 59 normally grown fetus

Placental Volume
(778.9 vs. 965.9, p=0.002)

Placental Volume and UtA PI Z-score
(r=-0.31, p=0.007)

f: Perfusion fraction
(30.2 vs. 32.3, p=0.3)

D: Diffusion coefficient
(1262 vs. 1441, p=0.05)

Conclusion
Placental perfusion assessed by IVIM model seems to be a promising technique for assessing placental insufficiency.