Early prediction of adverse pregnancy outcomes by uterine artery Doppler and cervical length in ART pregnancies

University of Chile Hospital, Santiago, Chile

Objective
The aim of this study was to evaluate whether first trimester uterine arteries Doppler (UtAD) and cervical length (CL) assessment were predictors of adverse maternal and perinatal outcomes of singleton pregnancies, conceived by assisted reproductive technologies (ART).

Methods
This is a historical cohort study of singleton pregnancies who had an 11 - 14 week assessment from 2005 to 2016. The ART cases were sub - classified based on the type of technique. The gestational age was adjusted by the CRL, and the cervical length measurement and uterine arteries Doppler (UtAD) were performed in all cases. The perinatal outcome was obtained by a review of the medical chart or by contacting the patient. The odds ratios (OR) were obtained by univariate logistic regression analysis, and adjusted by maternal age and parity. A sub - analysis was performed, considering ovarian stimulation/intrauterine insemination (OS/IUI) or in - vitro fertilization/intra - cytoplasmic sperm injection (IVF/ICSI).

Results
During the study period, 6,612 singleton pregnancies were evaluated with a known perinatal outcome. Of these, 105 pregnancies (1.6%) were conceived by ART (42 OS/IUI and 63 IVF/ICSI). As expected, patients with ART were older and with higher rates of nulliparity, compared to spontaneous pregnancies. There were no differences in body mass index, smoking habit or medical conditions between groups. Uterine artery (UtA) mean PI was similar between groups, but OS/IUI sub - group had an increased UtA mean PI, when compared to spontaneous pregnancies. Cervical length was significantly shorter in ART group (36.2 ± 5.2 vs 34.8 ± 4.7 mm, p < 0.001), particularly in those pregnancies conceived by OS/IUI. With regards to the outcome, ART patients were associated approximately with a two - fold odds of preterm delivery (PTD) < 37 and < 34 weeks compared to spontaneous pregnancies (1.90 [1.10 – 3.30] and 2.51 [0.99 – 6.38], respectively), particularly in those pregnancies conceived by OS/IUI (OR = 2.7 [1.27 – 5.64] and 3.7 [1.13 – 12.29], respectively). On the other hand, although the ART pregnancies were not associated with an increased rate of preeclampsia, there was higher odds of SGA < 10th centime, compared to spontaneous pregnancies (OR=2.66 [1.03 – 6.86]), especially in the OS/IUI sub - group. With regards to IVF/ICSI sub - group, this was only associated with a three - fold increase odds of cesarean section (OR=3.02 [1.58 – 5.78]).

Conclusion
Although ART pregnancies were associated with shorter cervical length than spontaneous conceived pregnancies, ART was not an independent risk factor for spontaneous preterm delivery. On the other hand, the sub - group of OS/IUI was associated with moderate placental insufficiency and low birthweight.