

EP07.32 Longitudinal Assessment of Maternal Hemodynamic and Placental Insufficiency-Related Doppler Indices in Small for Gestational Age

Xinyu Chen, Jing Lin, Lok Seng Wong, Yunyu Chen, Angela Sin Ting Tai, Long Nguyen-Hoang, Jiao Liu, Yimei Liu, Zesi Liu, Alex Pui-Wai, Liona C Poon

Background

Small for gestational age (SGA) fetuses are at increased rates of perinatal morbidity and mortality, particularly in preterm cases. Impaired maternal cardiovascular adaptation can coexist with placental insufficiency during pregnancy, and they are significantly correlated.

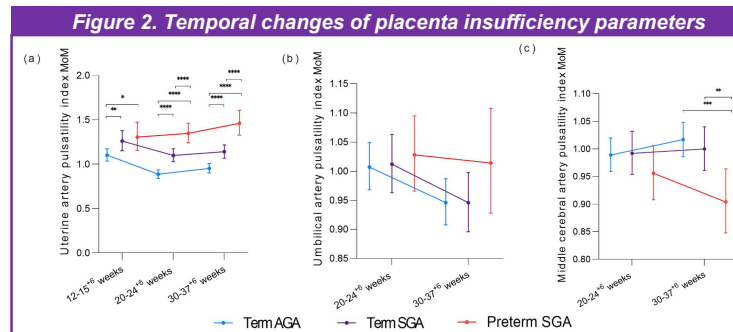
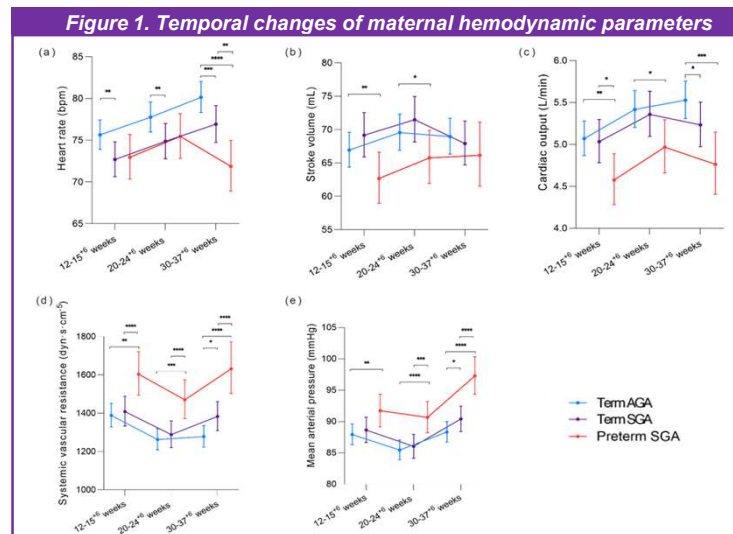
Objective

To explore the longitudinal changes in maternal hemodynamic characteristics and Doppler indices related to placental insufficiency among term appropriate for gestational age (AGA), term SGA and preterm SGA fetuses.

Methods

This prospective longitudinal study included 1088 Chinese women with singleton pregnancies: 827 term AGA, 189 term SGA, and 72 preterm SGA. Maternal CO, SV, SVR, MAP, HR and UtA-PI were measured at three antenatal visits (12–15+6, 20–24+6, and 30–37+6 weeks). Fetal UA-PI and MCA-PI were measured at visits 2 and 3.

Linear mixed-effects models were used to compare the trajectories of parameters, adjusting for specific confounding variables. Estimated marginal means were calculated, and pairwise comparisons were performed with Holm correction.



Results

1. Compared with term AGA,

Term SGA:

HR ↓ and UtA-PI ↑ throughout pregnancy;
CO ↓, SVR ↑ and MAP ↑ at visit 3;

Preterm SGA:

HR ↓, CO ↓, MCA-PI ↓, SVR ↑, MAP ↑, and
UtA-PI ↑ throughout pregnancy with significant
separation at visit 3.

2. Compared with term SGA,

Preterm SGA: CO ↓ and MCA-PI ↓, SVR ↑,
MAP ↑, and UtA-PI ↑ throughout pregnancy.

Conclusion

- SGA is associated with abnormalities in both the maternal cardiovascular system and placental circulation.
- Preterm SGA is associated with the worst hemodynamic and placental profile throughout pregnancy, with severity increasing in late pregnancy.

CO, cardiac output; SV, stroke volume; SVR, systemic vascular resistance; MAP, mean arterial pressure; HR, heart rate; UtA-PI, uterine artery pulsatility index; UA-PI, umbilical artery pulsatility index; MCA-PI, middle cerebral artery pulsatility index.