

Is the umbilical vein flow associated with birthweight?

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Objective

To investigate the relationship between the umbilical vein flow (UVF) measured close to term and birthweight (BW) in a cohort of pregnant at low-risk of placental insufficiency.

Methods

Prospective multicentre observational study conducted across two tertiary Maternity units between January 2021 and December 2022. Patients with a singleton appropriate for gestational age fetus between 35-38 weeks of gestation, who attended our antenatal clinic, were included. Pregnancy at higher risk of placental insufficiency or with fetal anomalies were excluded. At ultrasound examination, the abdominal circumference (AC), UV diameter and peak velocity of the UV were measured, and from these variables, the UVF/AC were calculated. The primary outcome of the study was the BW.

Results

Overall, 307 fetuses were included in our study. In our population, the median value of the UVF/AC was 0.65 ± 0.27 ml/min/mm, the mean BW 3419 ± 401 g, and the mean BW percentile 53.8 ± 27.9 . There was a direct correlation between UVC/AC and BW ($r=0.21$, $p<0.001$). At linear regression analysis, UVF/AC ($\beta=0.21$, 95% CI 0.10-0.32; $P<0.001$) had a significant effect on BW percentiles after adjusting for confounders. Subsequently, we divided our population into 4 groups according to the BW percentile. There was a significant linear trend of the UVF/AC (0.56 ± 0.21 vs 0.64 ± 0.27 vs 0.66 ± 0.25 vs 0.71 ± 0.31 ml/min/mm; $p=0.001$) on BW percentile, indicating that as UVF/AC increased, BW percentile increased proportionally. Interestingly, there was not a significant effect of UVF < 10th percentile (13.3% vs 11.2% vs 7.1% vs 8.6%; $P=0.59$) on BW percentiles.

Conclusion

Our results suggest a direct association between UVF and BW percentile in a cohort of patients at low-risk of placental insufficiency.