

Tricuspid annular plane systolic excursion (TAPSE) near delivery and adverse outcomes in severe early fetal growth restriction

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Introduction

Fetal growth restriction (FGR) is associated with cardiovascular adaptation, but longitudinal changes in right ventricular function are not well characterized.

Methods

This retrospective cohort study included 103 singleton pregnancies with severe early FGR undergoing serial ultrasound surveillance. Tricuspid annular plane systolic excursion (TAPSE) measurements were converted to gestational age-adjusted centiles. The final pre-delivery TAPSE was used for primary analyses, with low TAPSE defined as <10th centile. In pregnancies with ≥ 2 measurements, longitudinal assessment evaluated baseline, nadir, and final TAPSE centiles, and changes in the proportion of fetuses with TAPSE <10th centile over time. The primary outcome was a composite of neonatal intensive care unit admission, 5-minute Apgar score <7, or umbilical artery pH <7.1.

Results

Final TAPSE was available in 33 cases, of which 24% had TAPSE <10th centile. Low TAPSE was not associated with the primary outcome (25.0% vs 32.0%, $p=0.15$). Among 34 fetuses with serial measurements, median TAPSE centile declined from 36.0 at baseline to a nadir of 10.2, with higher final values (23.1). The reduction from baseline to nadir was significant ($p<0.001$), whereas the difference between baseline and final TAPSE was not. The proportion of fetuses with TAPSE <10th centile increased from 14.7% at baseline to 47.1% at nadir ($p<0.001$).

Conclusion: TAPSE demonstrates a dynamic, non-linear trajectory in FGR, with nadir values identifying deterioration not captured by single measurements. Final TAPSE was not associated with adverse neonatal outcome, supporting the value of serial assessment over cross-sectional evaluation.

