

Umbilical vein flow in monochorionic diamniotic twins

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Introduction

We aimed to define normal umbilical vein flow (UVF) parameters in monochorionic diamniotic (MCDA) twin pregnancies and to develop a predictive model for selective fetal growth restriction (sFGR).

Methods

Prospective longitudinal single-center cohort study.

- 204 MCDA twin pregnancies
- 1295 fetal measurements (every 2 weeks)
- Ultrasound measurements: umbilical vein diameter (UVD) and umbilical vein time-averaged maximum velocity (UV-TAMX)
- Calculation of umbilical vein blood flow:

$$TAMX \times d^2/4 \times \pi$$

Results

- Daily increase in UV-TAMX: **+0.0876 cm/s**
- Daily increase in estimated fetal weight (EFW): **+0.836 g/24h**
- Absolute UV blood flow: **48 ml/min at 20 wks**
→ **300 ml/min at 35 wks**
- Weight-normalized UV flow **decreases** with gestation (Fig. 2)

Conclusion

UV-TAMX correlates with fetal growth. A predictive model based on UV-TAMX and EFW trajectories can estimate future fetal weight and identify the risk of sFGR in MCDA twin pregnancies.

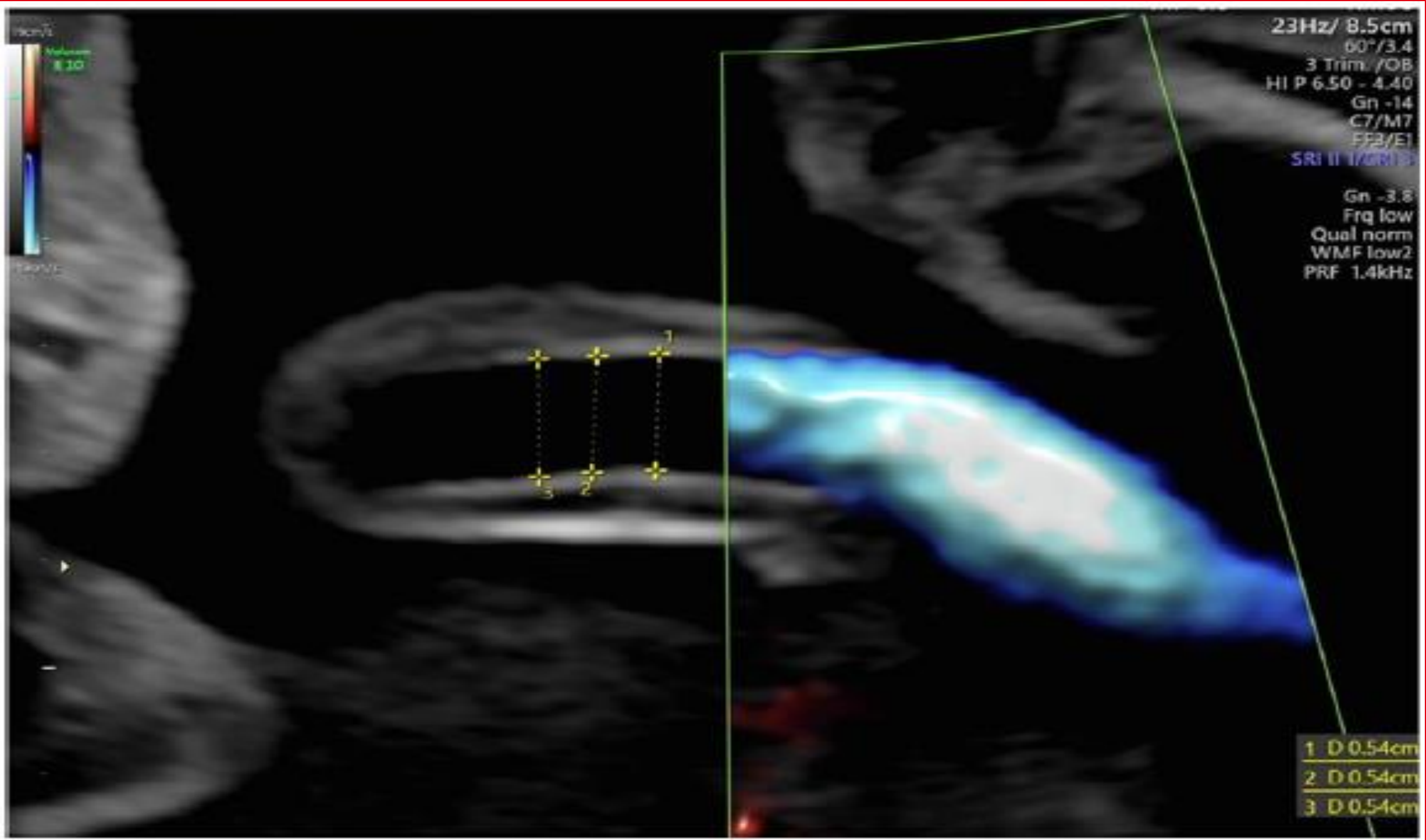


Figure 1. Measurement of umbilical vein diameter (UVD)

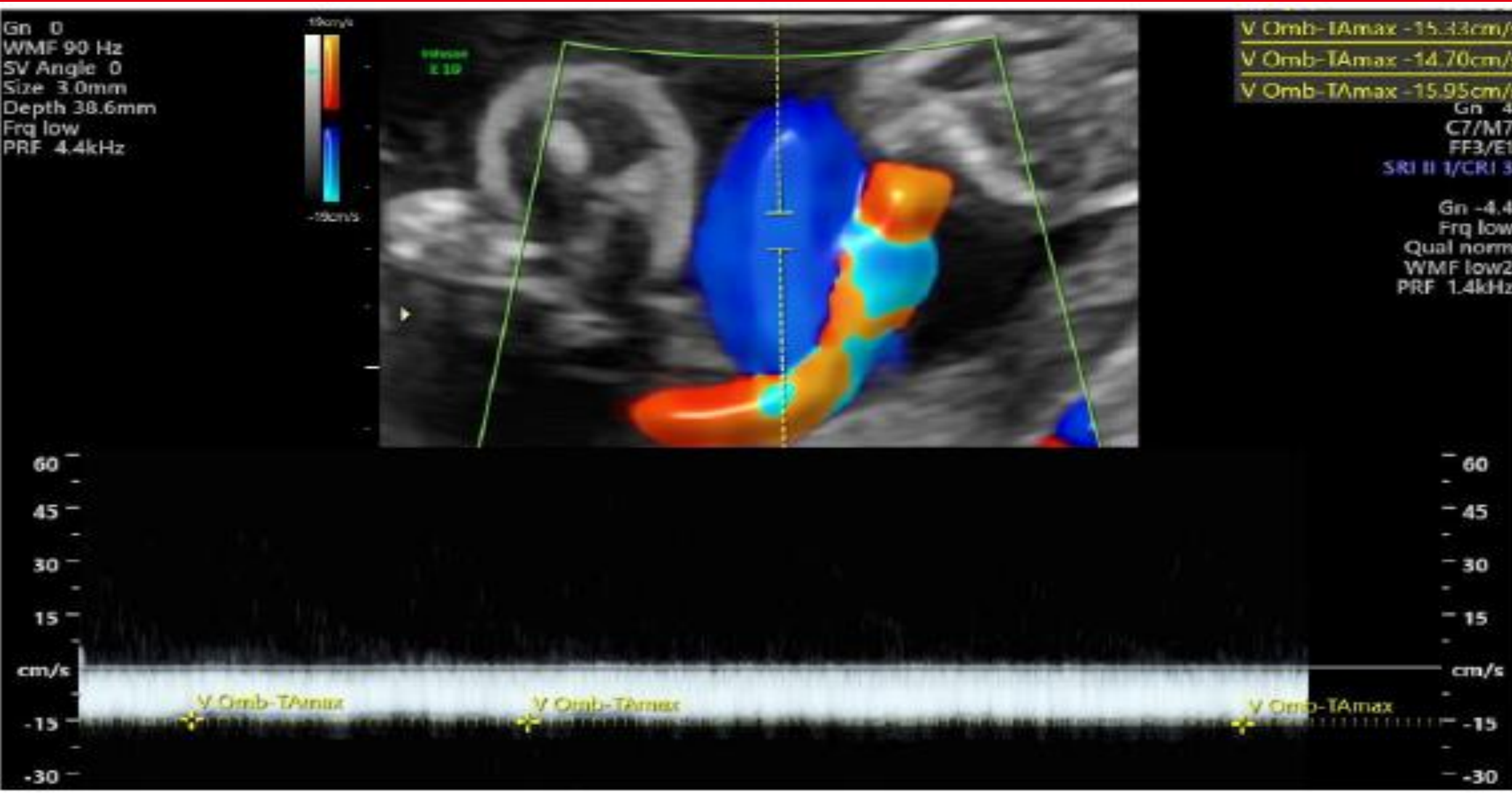


Figure 2. Measurement of blood flow velocity in the umbilical vein

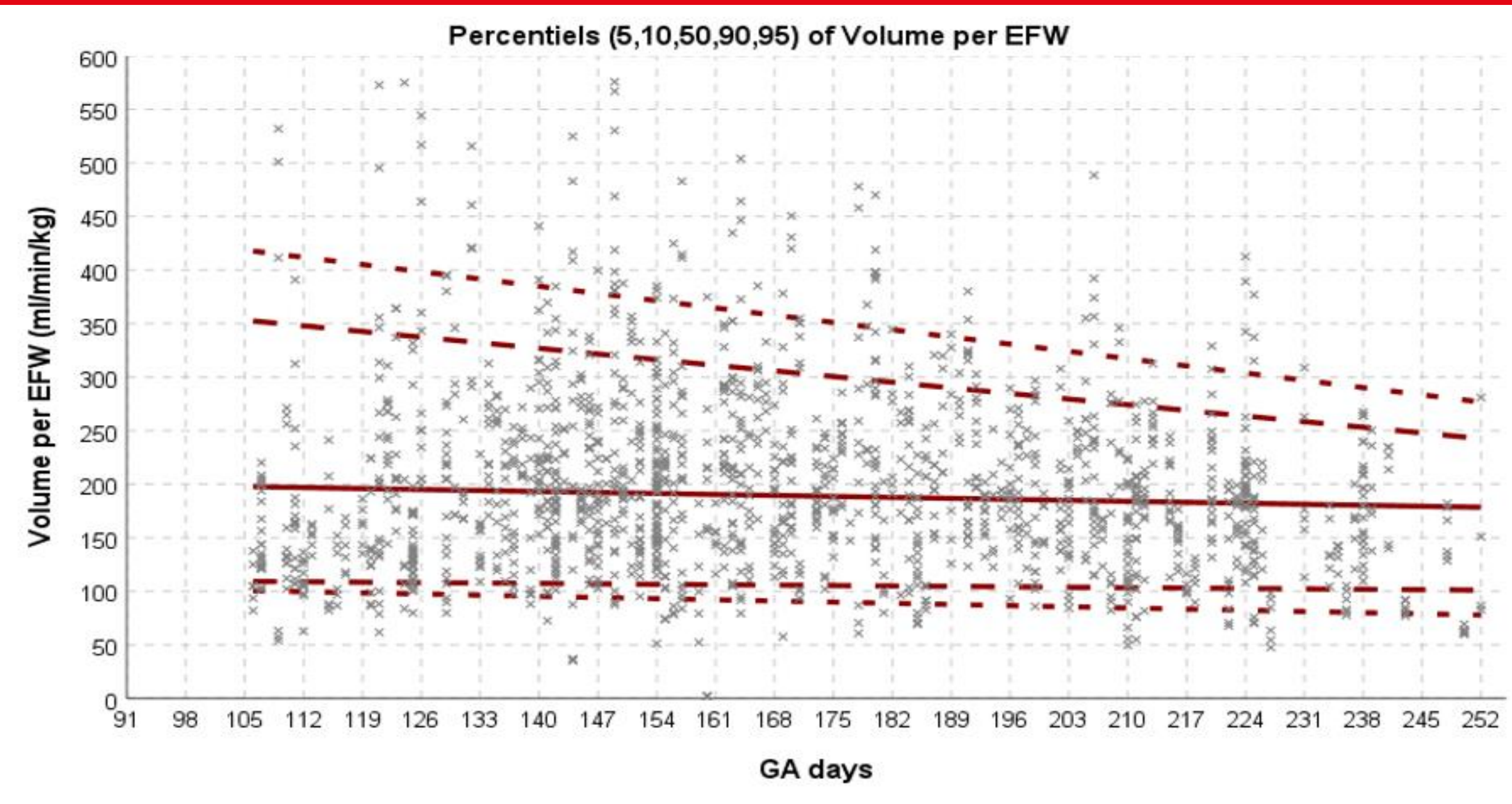


Figure 3. Dependency of weight-normalized UV flow on gestational age