

Intra- and inter-observer reliability of three-dimensional microvascular Doppler for quantitative assessment of placental vascularization (MV-Flow™)

Conrado Sávio Ragazini, Jenna Sawyer, Andrea Arnold, Carman Wing Sze Lai, Fabricio da Silva Costa

Objectives

To assess the intra- and inter-rater variability of placental measurements obtained with three-dimensional (3D) microvascular color Doppler imaging.

Methods

Nested reliability study within a prospective cohort study investigating pregnancy complications

Singleton pregnancies
26+0–28+6 or 35+0–36+6 weeks

HERA Z20 (Samsung) equipped with 3D microvascular color Doppler technology (MV-Flow™ 3D)

Placental vascularity was **quantitatively** assessed using:

- Vascular index (VI)
- Flow index (FI)
- Vascular flow index (VFI)

Intra- and inter-rater variability using **intraclass correlation coefficients (ICC)**

Results

Intra-rater reliability (initial analysis; n=26)

VI	FI	VFI
0.872	0.738	0.894
(95% CI 0.715–0.943)	(95% CI 0.498–0.873)	(95% CI 0.771–0.952)
GOOD	MODERATE	GOOD

Inter-rater reliability (n=23)

VI	FI	VFI
0.873	0.704	0.857
(95% CI 0.724–0.944)	(95% CI 0.424–0.944)	(95% CI 0.691–0.937)
GOOD	MODERATE	GOOD

Intra-rater reliability (expanded analysis, n=64)

VI	FI	VFI
0.904	0.799	0.899
(95% CI 0.848–0.941)	(95% CI 0.690–0.873)	(95% CI 0.839–0.937)
EXCELLENT	GOOD	GOOD

ICC interpretation: <0.50 poor | 0.50-0.74 moderate | 0.75-0.90 good | >0.90 excellent

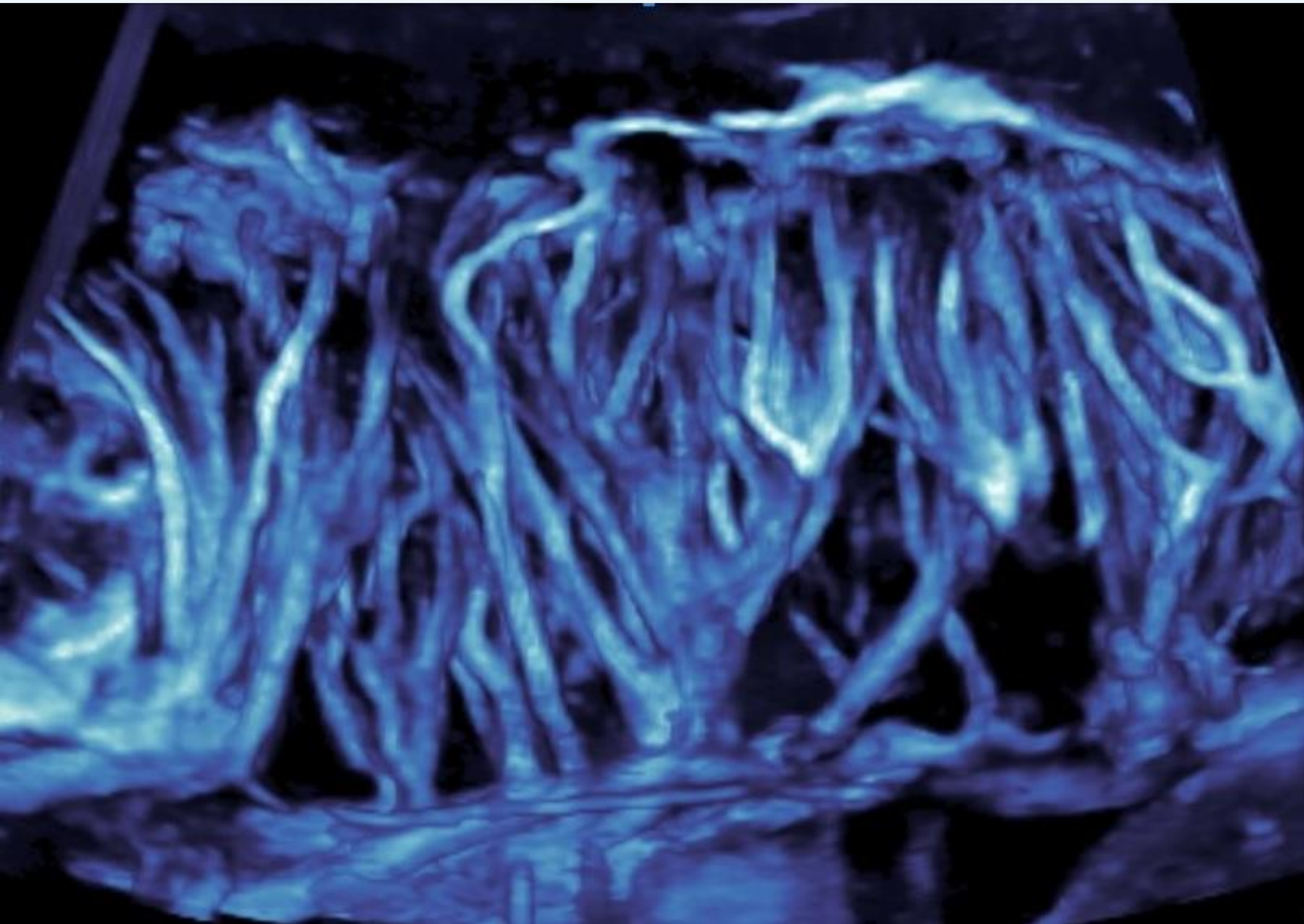


Figure 1. 3D rendering of placental vasculature using MV-Flow™

Conclusion

Three-dimensional quantitative microvasculature flow measurements in placental tissue appear to be reproducible both within and between examiners.

Human research ethics committee approval no.
HREC/2022/QGC/84257-AM08