

Longitudinal evaluation of umbilical artery Doppler velocimetry in the larger twin of monochorionic twin pregnancies complicated by selective intrauterine growth restriction



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Introduction

Monochorionic twins (MC) are fetuses with a higher risk of adverse outcome, with an even more increased risk when specific complications such as selective intrauterine growth restriction (sFGR) occur. Doppler investigation of umbilical flow is mandatory for the surveillance of these fetuses.

According to international classification, in sFGR twins type 1 umbilical artery pulsatility index (UA PI) is elevated, with positive diastolic flow, in type 2 end-diastolic flow is persistently absent or reverse, while in type 3 an intermittent absent or reversed end-diastolic flow is observed.

Objective

We aimed to explore UA PI along pregnancy in larger co-twins in MC twin pregnancies complicated by sFGR, and compare these findings with uncomplicated MC twins references¹.

Materials and methods

We conducted a longitudinal study on UA PI of a cohort of consecutive MC twin pregnancies complicated by sFGR type 1,2 and 3 monitored at our Unit from 2010 to 2018. The estimated centile curves of UA PI were obtained estimating the median with fractional polynomials by a multilevel model. The comparison with uncomplicated MC twins references previously published by our group was made through graphic evaluation.

Results

A total of 211 MC pregnancies complicated by sFGR were included: 105 type 1, 55 type 2 and 51 type 3. Each pregnancy underwent a median of 10 longitudinal ultrasounds. We present median UA PI from 16 to 37 weeks in the larger twin of MC twins pairs complicated by sFGR. Larger co-twins showed significantly lower UA PI median values throughout pregnancy when compared to uncomplicated MC twins (**Figure 1**).

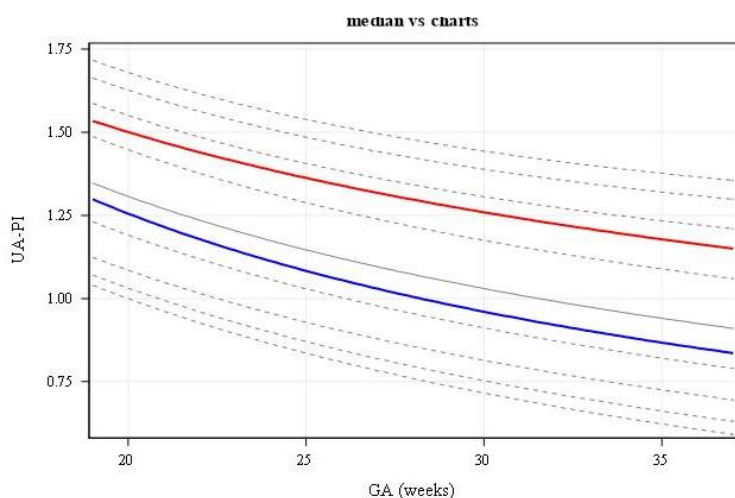


Figure 1. Comparison between the 50th estimated centile curves of umbilical artery pulsatility index (UA-PI) of the larger co-twins in MC twin pregnancies complicated by sFGR (either type 1,2 or 3; Blu Line) and uncomplicated MC twins¹ (grey lines). The red line indicates UA-PI median values of sFGR twins type 1.

Conclusion

Larger co-twins of MC twin pregnancies complicated by sFGR consistently exhibit significantly lower resistances in the umbilical artery compared to uncomplicated MC twins. This disparity can be observed from early second trimester until the end of pregnancy. This phenomenon may indicate a different hemodynamic balance throughout pregnancy. These preliminary findings need further evaluation and research.

References

1 Casati D et al., Longitudinal Doppler references for monochorionic twins and comparison with singletons. PLoS One. 2019 Dec 6;14(12):e0226090.