

Hepatic arterial buffer response in twin-to-twin transfusion syndrome

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Objective

Hepatic arterial buffer response (HABR) is an important regulatory process for maintaining hepatic blood flow and it is based on alternative circulation via hepatic artery. Its is currently unknown if this defence mechanism is activated in twin-to-twin transfusion syndrome (TTTS). The aim of this study is to test if HABR is operating in monochorionic diamniotic twins (MCDA) with TTTS.

Methods

Hepatic artery peak systolic velocity (PSV) was measured prospectively in 118 MCDA pregnancies. 73 without TTTS (group 1) and in 45 pregnancies with TTTS (group 2). Ratios were calculated for PSV (HAV-ratio), in group 2 recipient over donor and in group 1, bigger over smaller fetus. The association of HAV-ratio with TTTS, relation with other fetal Dopplers and reliability of measurement by a single operator were investigated.

Results

HAV-ratio appears to be independent from fetal Dopplers, estimated weight and gestational age. In group 2, HAV-ratio is lower than group 1 ($p < 0.001$, 95% CI 0.443–0.643). In group 1 the mean HAV-ratio is 1.014 (± 0.021) while in group 2 is 0.47 (± 0.035). Good reliability of measurements for hepatic artery PSV was demonstrated by intra-class correlation coefficient analysis (ICC 0.971 95% CI 0.963–0.977, $p < 0.001$).

Conclusion

Monochorionic pregnancies with TTTS have lower HAV-ratios when compared to normal MCDA. The reduced HAV-ratio can be explained by the activation of HABR in MCDA twins with TTTS.