Second systolic Peak in Middle Cerebral Artery Doppler: a sign of increased fetal Pulse Wave reflection after intrauterine transfusion (IUT)

Vonzun L.1, Ochsenbein-Kölble N.1, Zimmermann R.1, Gonser M.2
Departments of Obstetrics, 1: University Zürich, Switzerland & 2: Helios-HSK, Wiesbaden, Germany

Hemodynamic principles:
PW reflection and transmission to cerebral circulation: provides a 2nd accelerative impulse to flow on arrival at the flow recording site (MCA), induced by systemic vasoconstriction

Results: close agreement between:

Doppler results Time interval
⇒ Δt (2nd syst. Peak) = 80 ± 8ms

Model results: 2-way travel time
⇒ 2wTT = 76 ± 4ms

Hemodynamic Interpretation:
IUT results in transiently worsened fetal condition due to transient acidemia and high Hct.
• induces fetal vasoconstriction
• increases PW reflection,
• induces 2nd syst. MCA-Peak, P2
⇒ MCA-P2 may be useful for monitoring fetal acid-base recovery

Biometrical data (GA 28w): fetal vasc. path length: L(fAo+) ≈9.7cm±0.7cm (Szpinda 2008), fetal PWV: c(fAo) ≈255±6cm/s (Strujik 2011)