



Acute feto-fetal transfusion simulation in monochorionic twins

Haslik L, Vojtech J., Krofta L., Mackova K, Behavkova K, Pock R, Hanulikova P, Herman H, Feyereisl J
Institute for the Health of Mother and Child, Prague, Czechia

Objective

To clarify specific risk for acute feto-fetal transfusion (F-F TRF) in different clinical courses of monochorionic diamniotic (MCDA) twins in case of significant deterioration or death of one of the twins.

Methods

This was a prospective study analysing of 71 MCDA placentas by simulation of acute F-F TRF by histological colors in the period 2015-2017. All fresh (unfixed) placentas were prepared according to specific clinical protocol and analysed no longer than 48 hours after birth. The amount of dye flowing out from the umbilical cord simulating the dead fetus was measured in ml/min meanwhile fixed tonometer attached to the cannulated second umbilical cord was simulating the mean arterial pressure of the surviving fetus. All placentas were divided on the basis of typical clinical courses of MCDA pregnancies into the following subgroups: physiological course (PC) (N=49), twin-to-twin transfusion syndrome without (TTTS 1) (N=2) and after (TTTS 2) (N=3) laser therapy, selective fetal growth restriction (sFGR) (N=15) subdivided into sFGR 1 with type I and II flow in umbilical artery (UA) (N=11) and sFGR 2 with type III flow in (UA N=4) and twin anemia polycythemia sequence subgroup (TAPS) (N=2). All damaged and/or fixed placentas or placentas unsuitable for analysis for any reason, as well as pregnancies where the fetus died more than 24 hours before the birth, were excluded.

Results

In all 71 MCDA placentas at least one type of interfetal anastomosis was present. The total number of cases in our heterogeneous cohort regardless the clinical course was 45%. The highest risk of F-F TRF was for sFGR2 (4/4; 100%) followed by PC (24/25; 49%), sFGR1 (3/11; 27%), , TTTS1 (1/2 in case of the recipient death and 0/2 in donor death simulation), TAPS (0/2; 0%) and TTTS2 (0/3; 0%) respectively. An important risk factor for F-F TRF was presence of superficial low-resistance AA anastomose and close umbilical cord insertions. In all cases with umbilical cord insertions of less than 4cm apart, a form of fast F-F TRF occurred. Mean transfusion time of 1 ml was 26s (min 10s, max 90s) regardless the clinical course.

Conclusion

Proven F-F TRF was significantly different for different clinical subtypes whose clinical courses are influenced by the composition of interfetal anastomoses with highest risk in the presence of AA anastomoses and close umbilical cord insertions.



