MCDA twin pregnancy: TTTS or TAPS?

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Objective

Twin-to-twin transfusion syndrome (TTTS) and twin anaemia polycythaemia sequence (TAPS) are complications unique to monochorionic (MC) twin pregnancies and their shared circulation. Both are the result of transfusion imbalance in the inter-twin circulation. TTTS is characterised by an amniotic fluid discordance. Whilst TTTS is a well-known syndrome, the less common form of chronic feto-fetal transfusion, TAPS, has also been described. TAPS arise from relatively minor inter-twin transfusion through a small number of miniscule (<1mm) unidirectional, non arterio-artery anastomoses. Transfusion is sufficiently slow, estimated at 5-15ml/24 hours so that both twins can compensate for the fluid redistribution, thus manifesting as solely a haemoglobin discrepancy. Most cases of TAPS appear to arise spontaneously, after 26weeks, with an incidence of 3-5% in MC twins and potentially as a precursor to the more severe TTTS. In TAPS, there is a large discrepancy in fetal haemoglobin levels in the absence of amniotic fluid differences making it difficult to diagnose on scan without MCA Doppler. Cases have also been described where TAPS arises following a fetoscopic laser surgery for TTTS, often in the reverse pattern such that the polycythaemia recipient then becomes anaemic. We present our case firstly to raise awareness of this rare and little known condition.

Methods

This is a case report.

Results

A 37-year-old, para 2 was followed for a MCDA twin pregnancy. Follow-up scans reported normal results until 30+3 weeks, when there was mild pericardial effusion noted in twin one, however growth, liquor and Doppler's were normal. A scan the following day showed significant pericardial effusion in twin one, with normal cardiac structure and umbilical artery Doppler flow, but a high middle cerebral artery Vmax of 63cm/s. Ductus venosus Doppler had a positive a-wave but high pulsatility index. Twin two had normal biometry with normal umbilical artery and ductus venosus Doppler's, but a reduced MCA Vmax of 20cm/s. These features were suggestive of TAPS. She had CTG monitoring and steroid administration was completed. Delivery by caesarean section was performed 24 hours later, at a gestation of 30+5 weeks at the referring hospital with neonatology input. Twin one was born very pale with birthweight of 1.43kg, haemoglobin of 30g/L, and required intubation. Twin two was born with a heart rate of 40-60 beats per minute and required chest compressions and intubation. She weighed 1.75kg with haemoglobin of 260g/L. Imaging suggested pulmonary hypertension and an intraventricular haemorrhage. She had a cardiac arrest from which she could not be resuscitated and died 7 hours after birth. There was no nucleated red cell count sent. A post mortem autopsy confirmed pulmonary interstitial haemorrhage and myocardial haemorrhage. The surviving twin was doing well at 13 month follow up.

Conclusion

Antenatal diagnosis of TAPS is traditionally based on a discrepancy in middle cerebral artery peak systolic velocity between the twins; MCA-PSV in the donor twin >1.5 MoM combined with a decrease in MCA-PSV in the recipient twin (<1 MoM). These cut offs can accurately predict anaemia and polycythaemia in TAPS. MC twin pregnancies can become high risk at any time and undiagnosed TAPS can also lead to demise of one or both twins.