

Renal failure in a neonate born as the single survivor of a pregnancy complicated by twin to twin transfusion

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Case report

A primiparous mother aged 24 years, diagnosed as having dichorionic diamniotic (DCDA) twins presented at 32 weeks of gestational age complaining of reduced fetal movements. Ultrasound scan (USS) revealed intrauterine death of one fetus. An emergency lower segment caesarean section delivered a male fetus of 1400g with a clinical maturity of 31 weeks. The Apgar scores were 1, 6 and 6 respectively at one, five and ten minutes. The macerated fetus weighed 800g.

The newborn was admitted to the special care baby unit and was noted to have significant pallor, generalised oedema and respiratory distress. He had haematuria since day one which cleared up subsequently, but evolved to oliguria. The neonate developed refractory generalised oedema and hypertension towards the latter part of his hospital stay. He developed intermittent gastrointestinal and mucosal bleeding since day five. No seizures were noted throughout the period. Full blood count at 30 minutes of age showed a haemoglobin of 6.5 g/dl, a platelet count of 63,000/cu mm and a white cell count of 8,030/cu mm with 63% neutrophils and 31% lymphocytes. Blood picture showed features of prematurity and sepsis with evidence of haemorrhage.

On day 2, serum creatinine was 122 micromoles/L (normal range for day 2: 35-75 micromoles/L) which continued to rise despite adequate hydration

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and control of hypertension. It reached 453 micromoles/L on day 27 of life. The baby was given multiple blood products including packed cell transfusions to correct anaemia and to prevent bleeding. He was ventilated from day 2 of life and was ventilator dependant until his demise. USS of abdomen on day 10 showed bilateral renal parenchymal disease, bilateral pleural effusions and ascites. USS of the brain did not show any abnormality. Baby passed away on day 32 of life due to complications of chronic renal insufficiency.

Discussion

Twin to twin transfusion (TTTS) is rare in dichorionic (DC) pregnancies¹. It is the commonest complication in monochorionic (MC) twins². Anaemia, respiratory distress and renal insufficiency point towards the diagnosis of this neonate being the donor in TTTS in a DC pregnancy.

There is 89.8% sensitivity and 99.5% specificity for diagnosis of MC placenta at 14 or less weeks of gestation and 88.0% sensitivity and 94.7% specificity for diagnosis of MC after 14 weeks of gestation³. Newborns with TTTS can develop renal failure, periventricular leukomalacia, cerebral atrophy and necrotizing enterocolitis². Intrauterine death of one twin and severe anaemia at birth are indicative of a poor prognosis for the living twin⁴. Quintero system of staging is used in TTTS and our patient belonged to stage V⁴. After an intrauterine death in a MC pregnancy, the living twin has a 15% risk of death and a 26% risk of neurological abnormality⁵. Acute cortical necrosis resulting from ischaemic injury to the kidney can manifest as haematuria. Structural anomalies in twins undergoing fetal death are significantly increased in comparison to normal twin pregnancies⁵.

The frequently proposed mechanisms of damage to the surviving MC twin are transchorionic embolisation with coagulopathy and haemodynamic fluctuations⁶. The most likely pathophysiological mechanism causing damage to the surviving fetus in a MC twin pregnancy is haemodynamic fluctuation. The death of one twin will lead to exsanguination of the surviving one via placental vascular anastomoses as hypotension

occurs with the death of the twin. Hypotension and poor perfusion lead to ischaemic organ damage⁶.

Rapid delivery is usually unwise, unless at term, as fetal brain injury of the surviving twin occurs at the time of demise of the co-twin. A conservative management policy is often appropriate, with serial fetal brain ultrasound imaging and a fetal cranial MRI scan, commonly 4 weeks after the event. Serious compromise of the surviving fetus needs to be anticipated and this should be discussed with parents³.

Management differs from patient to patient and conservative management is preferred⁶. Renal replacement therapy (RRT) with peritoneal dialysis and pre-emptive renal transplant later would probably have been an option in our patient. Neonatal renal replacement has 65% mortality and 66% development delay in the survivors⁷. This option is not offered as yet in Sri Lanka.

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