

Exceptional Case

Dialysis for twins

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Abstract

A 32-year-old woman with known stage-4 chronic kidney disease due to lupus nephritis presented with twin pregnancy after *in vitro* fertilization at a gestational age of 24 weeks + 3 days because of imminent preterm labour. Repeated ultrasound evaluations confirmed intrauterine growth restriction in both twins and polyhydramnios as the cause of imminent preterm labour. After initiation of haemodialysis treatment, ultrasound evaluation showed a significant decrease in amniotic fluids, and also reduction in blood urea nitrogen and in clinical complaints could be observed. At a gestational age of 28 weeks + 4 days, delivery was performed by Caesarean section. This case study shows that effective treatment of elevated uraemic toxins significantly reduced the morbidity risks of the twins.

Keywords: chronic kidney disease; dialysis; pregnancy; twins

Background

Chronic kidney disease is associated with increased risks during pregnancy. From the maternal side, gestational hypertension, pre-eclampsia, eclampsia and death have been described. From the fetal side, intrauterine growth restriction, polyhydramnios, premature birth and small for gestational age have been observed more frequently compared with the general population [1].

Case report

A 32-year-old woman presented with twin pregnancy after *in vitro* fertilisation at a gestational age of 24 weeks + 3 days because of imminent preterm labour. She had stage-4 chronic kidney disease due to lupus nephritis that had been diagnosed 15 years earlier. Before pregnancy, the woman was treated with prednisolone and hydroxychloroquine. Her blood pressure was controlled with labetalol and methyldopa. Before pregnancy, her urinary protein level was 0.4 g/L (normal value < 0.1 g/L). At admission, her blood pressure was 110/80 mmHg and heart rate 88 beats per min and regular. Plasma creatinine was 258 µmol/L (normal values < 80 µmol/L) and blood urea nitrogen was elevated to 20 mmol/L (normal values < 7.8 mmol/L). Haemoglobin was reduced to 6.3 mmol/L (normal values, 7.0–10.0 mmol/L), whereas alanine aminotransferase (7 U/L), lactate dehydrogenase (169 U/L) and platelet counts ($191 \times 10^9/L$) were in the normal range. Clinical examination showed uterus contractions

and shortening of the cervix indicating threatening preterm labour. Continuous infusions of the tocolytic substance, atosiban, and an oxytocin receptor antagonist were administered to halt premature labour. However, contractions reinstated when atosiban was paused. Ultrasound examinations were performed using a Voluson ultrasound machine (General Electric Healthcare, Amersham, UK) with the woman in a semi-recumbent position. Amniotic fluid volume was measured according to the standardized techniques using the single deepest pocket measurement giving the vertical dimension of the largest pocket of amniotic fluid measured at a right angle to the uterine contour [2, 3]. The single deepest pocket measurement is interpreted as normal amniotic fluid volume (2.1–8.0 cm) and polyhydramnios (>8.0 cm). Ultrasound showed diamniotic and dichorionic twins with estimated weights of 609 and 693 g, respectively. Repeated ultrasound evaluations confirmed intrauterine growth restriction in twin 1 by 24.7 % and twin 2 by 14.3%, respectively, and polyhydramnios as the cause of imminent preterm labour (Figure 1A). Because of the well-known association between polyhydramnios and elevated uraemic toxins, intrauterine growth restriction and threatening preterm labour of premature children, haemodialysis treatments were started to reduce uraemic toxins, including blood urea nitrogen (Figure 1B). Dialysis was administered 6 days per week for 3 h each using a biocompatible haemodialysis membrane. After initiation of haemodialysis treatment, ultrasound evaluation showed a significant decrease in amniotic fluids and reduction in the clinical complaints. At a gestational age of 28 weeks + 4 days, pre-eclampsia developed showing an elevated

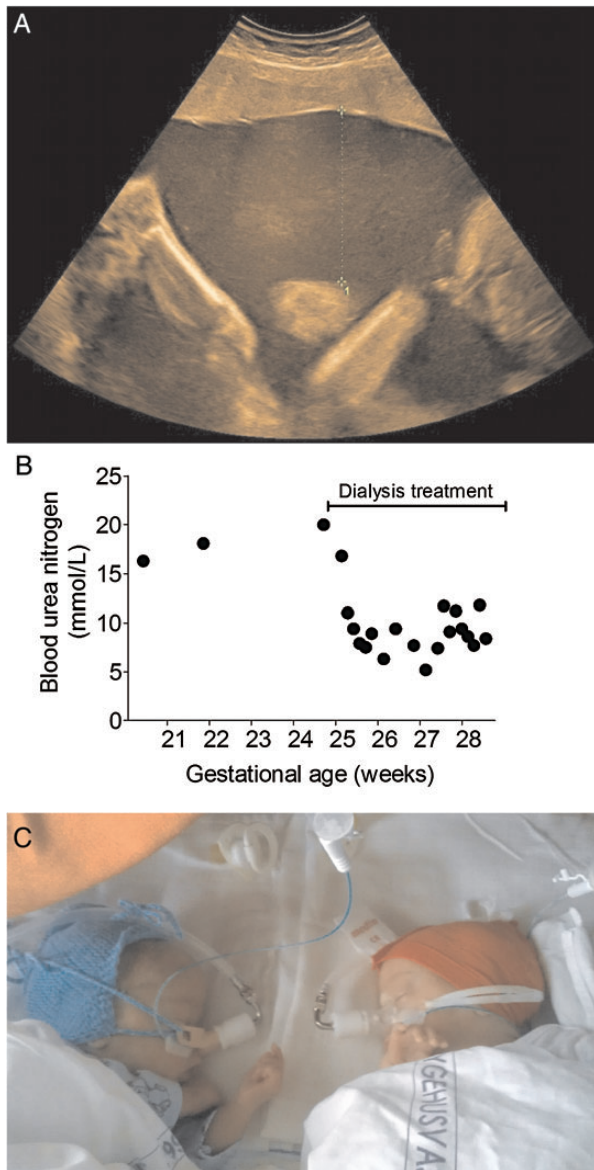


Fig. 1. Example for the determination of amniotic fluid volume using the single deepest pocket measurement (dotted line in **A**) and change of blood urea nitrogen (**B**) in a woman with known chronic kidney disease, presenting with twin pregnancy and imminent preterm labour, before and after starting haemodialysis treatment. (**C**) Twins after delivery at a gestational age of 28 weeks + 4 days.

maternal blood pressure, elevated liver enzymes as well as an elevated pulsatility index in the arteria umbilicalis. Thus, we were forced to deliver by Caesarean section. Birth weights of the twins were 941 and 1164 g, respectively (Figure 1C). Six weeks after delivery and cessation of haemodialysis, the mother's plasma blood urea nitrogen was 18 mmol/L, and plasma creatinine was 264 μ mol/L. When the twins were seen last at the age of 12 months, the psychomotor development was uneventful.

Discussion

There have been previous reports of pregnancy in prevalent haemodialysis patients [4]. However, the present case is unique because haemodialysis had to be started in a woman with moderate-chronic kidney disease due to life-threatening fetal complications during pregnancy. This case suggests that reducing polyhydramnios by haemodialysis in a woman presenting with twin pregnancy and preterm labour, with known chronic kidney disease and elevated uraemic toxins, can prolong pregnancy considerably, even up to several weeks. Effective treatment of elevated uraemic toxins thereby significantly reduced the morbidity risks of the twins.

Conflict of interest statement. None declared. The authors declare that they have no competing financial interests. The results presented in this paper have not been published previously in whole or part, except in abstract format.

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