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CASE REPORT

Successful pregnancy in a South African patient with end-stage renal disease with the use of thrice-weekly nocturnal haemodialysis

Piers A Stead[1], Nabeel A Bapoo[1], Ronell Grobbelaar[1], Derek Miller[2], Douglas Dumbril[1]
[1]Life Vincent Pallotti Hospital, Cape Town, [2]Mediclinic Constantiaberg, Cape Town

ABSTRACT

Pregnancy outcomes in patients on chronic dialysis have improved as a result of the intensification of dialysis and improved perinatal care. We report the successful outcome of a pregnancy in a patient on chronic haemodialysis in Cape Town, South Africa. With intensification of her therapy using thrice-weekly, nocturnal haemodialysis the pregnancy was maintained until 34 weeks at which time a 1.86 kg baby boy was delivered by elective caesarean section. One year later the patient was doing well on maintenance haemodialysis and the baby was achieving his developmental milestones. This report highlights our ability to employ a multi-disciplinary approach and prolonged, nocturnal haemodialysis to support pregnant dialysis patients in the South African setting and achieve good outcomes for both mother and baby.

INTRODUCTION

The first successful pregnancy in a patient on chronic haemodialysis was reported by Confortini et al. in 1971 [1]. Since then, live birth rates of pregnant dialysis patients have improved from around 20% in the 1980's to 50% in the 2000's and now exceed 80% [2-4]. The recent meta-analysis by Piccoli et al. [4] highlights the improving pregnancy outcomes in both haemo- and peritoneal dialysis patients. This encouraging trend has been achievable primarily through the intensification and increased duration of haemodialysis sessions and also by improved perinatal care. The introduction of prolonged nocturnal dialysis facilitates the ability to deliver more than 25 hours of haemodialysis weekly. Maternal mortality remains very high, however, 400 times that of the non-dialysis population. It is estimated that pre-eclampsia affects more than 75% of pregnant haemodialysis patients.

In South Africa, it is uncommon for patients on chronic dialysis to have successful pregnancies, although colleagues from around the country have indicated that they have had occasional patients with good outcomes. To the best of our knowledge, none of these cases have been formally published. Here, we report the successful outcome of a pregnancy in a patient on chronic haemodialysis in Cape Town, South Africa. The patient provided written consent for publication.

CASE PRESENTATION

A 27-year-old woman with end-stage renal disease due to systemic lupus erythematosus had her first living-related kidney transplant at the age of 20 years. When this failed, she subsequently underwent a second deceased-donor transplant at age 25. Eight months later she developed severe cellular rejection and haemodialysis therapy was commenced. After a short period of haemodialysis she was established on peritoneal dialysis and treated with this modality for a period of just under two years. She was then transferred back to haemodialysis and was on this modality when she fell pregnant.

At a follow-up visit she reported that her last menstrual period had been four months earlier. Laboratory testing confirmed that she was pregnant. Her dialysis prescription was changed in order for her to receive more than 20 hours of dialysis per week. She was transferred to our dialysis unit for extended, nocturnal haemodialysis.

She was dialysed three times a week for 8 hours per session. Vascular access was obtained via a tunnelled

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Correspondence: Dr PA Stead, office@drstead.co.za.

dialysis catheter in the right internal jugular vein. Blood flow rates were set at 200 ml/min and the dialysate flow rate at 500 ml/min. Enoxaparin 40 mg was administered subcutaneously for anticoagulation prior to each dialysis session as she had previously had an allergic reaction to intravenous heparin. No adverse reactions or bleeding occurred.

The patient's blood pressure (BP) remained normal during the pregnancy with no need for any antihypertensive medication. BP on dialysis ranged from 90/41–135/72. Weight gain between dialysis sessions varied between 1.6–3.5 kg. The patient had no residual renal function.

Ultrasound scanning was performed by a foetal medicine specialist one month after starting nocturnal dialysis. This indicated that she was 22 weeks pregnant. The patient was monitored every two weeks by her obstetrician. At 26 weeks gestation, a repeat foetal assessment was performed. The foetus was estimated to weigh 800 g and was determined to be potentially viable. Thereafter, whilst the patient was on dialysis, the baby received continuous cardiotocograph monitoring, supervised by an obstetric nursing sister.

Serum biochemistry and haematology parameters were monitored monthly. The patient received regular intravenous iron sucrose infusions and an erythropoiesis-stimulating agent was administered according to her haemoglobin level (Table 1). We were limited to a maximum dose of Mircera® (methoxy polyethylene glycol-epoetin beta) of 200 µg monthly because of cost constraints. Despite regular monitoring and the treatment prescribed she remained anaemic and had a haemoglobin concentration of 8.3 g/dl at the time of delivery.

At 33 weeks gestation she developed preterm labour and was admitted to hospital. At 34 weeks she underwent an elective caesarean section. A baby boy was born, weighing 1.86 kg. The baby's APGAR scores were 5 and 7. He spent three days in the neonatal high care unit and a further six days in the neonatal nursery. When his weight was 2.0 kg, he was discharged home. The mother was discharged after four days and resumed her pre-pregnancy dialysis schedule of four-hour sessions three times a week. She has remained stable on dialysis one year later. Her son is alive and achieving his developmental milestones at one year.

Table 1. Summary of anaemia management during pregnancy.

Weeks of pregnancy	Dry weight (kg)	Haemoglobin (g/dl)	Iron sucrose dose
19–22	56.0	8.2	50 mg weekly
22–25	57.5	6.8	100 mg weekly
26–29	59.0	7.2	100 mg weekly
30–33	63.0	8.3	100 mg weekly

Mircera® 200 µg monthly was administered throughout.

DISCUSSION

The review by Piccoli et al. [4] highlighted only two factors which correlated with foetal outcomes. These two factors related to the dialysis schedule: dialysis frequency and dialysis duration. The total number of hours of dialysis per week correlated significantly with foetal outcomes.

Nocturnal or prolonged-duration chronic dialysis is not widely available in South Africa as it requires dedicated dialysis nursing staff and 24-hour availability of a nephrologist. Our access to prolonged dialysis treatments allowed us to deliver the desired dose of dialysis in three sessions per week, and at a lower total cost than would have been the case if we had used five or six of the standard 4-hour sessions weekly.

Our multi-disciplinary team played an important part in the positive outcome. Assessing dry weight and preventing polyhydramnios is essential and this required regular review by the attending nephrologist. Our patient was reviewed regularly by her obstetrician and a foetal medicine specialist. Foetal monitoring while she was on dialysis was supervised by a trained obstetric nurse and should be recommended, although it does add to the overall costs.

In conclusion, we have achieved a successful pregnancy outcome in a patient on chronic dialysis and highlighted our ability to maintain a pregnancy to viability with the support of a multidisciplinary team and using thrice-weekly, prolonged, nocturnal dialysis. This report also provides South African women of child-bearing age on dialysis with the hope that they may be able to contemplate a successful pregnancy.

Conflict of interest

None to declare.

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