Successful Pregnancy in an End-Stage Renal Disease Patient on Peritoneal Dialysis

Among women with chronic kidney disease, successful pregnancy with a surviving infant is rather rare. Although these pregnancies carry higher risk, with the possibility of adverse maternal and fetal outcomes, they can be managed with close monitoring and intense renal replacement therapy. Given the hemodynamic advantages of peritoneal dialysis over hemodialysis in pregnancy, peritoneal dialysis therapy is thought to be a favorable renal replacement option in pregnant patients with chronic kidney disease.

Key words
Chronic kidney disease, pregnancy, hemodialysis, renal replacement

Case report
A 29-year-old woman with mild renal impairment presenting in the 14th week of gestation with nausea and vomiting was found to be uremic. She had a history of hypertension and renal impairment, conditions that had been diagnosed during her first pregnancy 4 years earlier. Her blood pressure was controlled in the range 110/60 – 110/70 mmHg with long-acting nifedipine 30 mg daily, and no physical abnormalities were noted except for bilateral pretibial edema.

Laboratory investigations showed her serum creatinine to be 3.7 mg/dL [normal range (NR): 0.5 – 1.4 mg/dL]; blood urea nitrogen, 35 mg/dL (NR: 5 – 25 mg/dL); albumin, 2.8 g/dL (NR: 3.5 – 5 g/dL); calcium: 7.7 mg/dL (NR: 8.2 – 10.6 mg/dL); hemoglobin, 11 mg/dL (NR: 13 – 17 mg/dL); and 24-hour proteinuria, 2.2 g (NR: 0 – 150 mg). Renal ultrasonography revealed small scarred kidneys bilaterally, consistent with chronic kidney disease (CKD). A vasculitis screen was negative.

This patient’s prior pregnancy had ended in a stillbirth in the 26th week of gestation because of pre-eclampsia. She had been followed by a nephrologist for the subsequent 4 years, during which her CKD had been stable. Given her past medical history and current laboratory tests, she was diagnosed with CKD stage 5.

The patient was treated with folate and iron supplements, essential ketoacids, and erythropoietin. At week 16 of gestation, a peritoneal catheter was inserted because her serum creatinine rose to 4.3 mg/dL and her blood urea nitrogen, to 54 mg/dL, with a serum pH of 7.30 and HCO₃ of 18.2. Peritoneal dialysis was commenced using 1500-mL exchanges of 2.27% glucose solution 4 times daily because she had residual renal function of approximately 1000 mL daily. With gestational advancement, the exchange volume was lowered to 1200 mL, and the frequency was increased to 6 exchanges daily.

An elective caesarean section was performed at week 34. A male infant (2370 g, 49 cm, with Apgar scores of 7 and 9) was born. The patient’s postpartum period was uneventful. After laparotomy, the patient was maintained on hemodialysis for about 5 weeks. The patient then returned to peritoneal dialysis.

Discussion
Among women on chronic dialysis, a successful pregnancy with a surviving infant is rare. The pregnancy rate is between 1% and 7% in these women, and only 30% – 50% of the pregnancies result in delivery of an infant who survives (1).

Frequently, pregnancy is detected late in women on PD. Most of these patients have irregular menstruation, or even amenorrhea, and early symptoms of pregnancy such as nausea and vomiting are frequent and similar to the symptoms of uremia. Early detection of pregnancy in CKD patients is very important so that the appropriate method for follow-up and treatment can be chosen. Late diagnosis increases the risk of maternal and fetal complications (2).
Peritoneal dialysis and hemodialysis are both feasible for pregnant CKD patients (3), but hemodialysis can lead to marked hemodynamic changes caused by large fluid removal volumes, and blood pressure fluctuations can possibly cause alterations in placental blood flow and disequilibrium affecting fetal homeostasis. Peritoneal dialysis provides continuous dialysis, smoother control of urea removal, and less dramatic changes in maternal intravascular volumes, which may diminish hemodynamic changes in the uteroplacental circulation and result in less-acute fluctuations of blood pressure.

A potential problem with peritoneal dialysis is that the increase in intra-abdominal volume in the presence of the gravid uterus may mean that the available space and surface for adequate peritoneal exchange is insufficient. That concern can be managed by reducing the peritoneal fluid exchange volumes and using more frequent exchanges (4,5).

Conclusions
This small case demonstrates that, although pregnancies in dialysis patients are high-risk, with a possibility of adverse maternal and fetal outcomes, they can be managed with close monitoring and intense renal replacement therapy. With respect to the hemodynamic advantages of peritoneal dialysis over hemodialysis in pregnancy, we can conclude that peritoneal dialysis is thought to be a favorable renal replacement option in pregnant CKD patients.

Disclosures
The authors have no financial disclosures and no conflicts of interest to report.

References

Corresponding author:
Salih İnal, MD, Gazi University Medical School, Department of Nephrology, 06500 Beşevler, Ankara, Turkey.
E-mail: salihinal@yahoo.com