

SPONTANEOUS PRETERM LABOR DURING HEMODIALYSIS IN A PATIENT WITH END-STAGE RENAL DISEASE AND ADVANCED MATERNAL AGE: A CASE REPORT

Moch. Arif Rachmana^{1*}, Lupita G. Laraz², Raditya Ery Pratama³, Agnes Ilene
Suprpto Puteri⁴

¹General Practitioner, RSUD Ibnu Sina Gresik

^{2,4}Faculty of Medicine, Airlangga University Surabaya

³Department of Obstetrics and Gynecology, RSUD Ibnu Sina Gresik

Correspondence Email: mocharifrachmana03@gmail.com

Disubmit: 25 September 2025

Diterima: 31 Oktober 2025

Diterbitkan: 01 November 2025

Doi: <https://doi.org/10.33024/mnj.v7i11.22863>

ABSTRACT

Pregnancy in patients with ESRD is rare due to impaired fertility caused by HPO axis disruption. Nevertheless, with advancements in dialysis and maternal care, successful pregnancies have increasingly been reported. Such pregnancies, however, are considered high-risk and are often associated with complications such as preterm labor, intrauterine growth restriction, and low birth weight, particularly in patients with comorbidities like chronic hypertension and other risk factors such as AMA. A 41-year-old gravida 3 para 2 woman with ESRD secondary to chronic hypertension, undergoing routine hemodialysis twice weekly with each session lasting five hours for the past five years, presented with spontaneous preterm labor during a scheduled dialysis session. The patient began experiencing uterine contractions accompanied by a bloody show during the second hour of hemodialysis. The session was discontinued prematurely due to these symptoms. Subsequent examination revealed cervical dilation of 3 cm, confirming the onset of labor. Due to a history of menstrual irregularities, the pregnancy had been recognized relatively late, at 20 weeks of gestation. At 31 weeks, the patient delivered a live preterm infant. The neonate was born with low birth weight but responded well to immediate neonatal management and stabilization. Although pregnancy in ESRD patients presents significant risks, favorable maternal and neonatal outcomes can still be achieved. This case illustrates the importance of early detection, coordinated multidisciplinary care, and vigilant monitoring in improving perinatal outcomes in women undergoing chronic hemodialysis.

Keywords: End-Stage Renal Disease, Hemodialysis, Preterm Labor, High Risk Pregnancy.

INTRODUCTION

End-stage renal disease (ESRD) is mostly associated with a reduced fertility rate, primarily due to the hormonal imbalances that occur in the hypothalamic-pituitary-ovarian (HPO) axis. It may result in chronic

anovulation, hyperprolactinemia, and impaired gonadotropin secretion. Hence, spontaneous pregnancy in women undergoing dialysis is relatively rare (Gorayeb-Polacchini, 2024). However, a study

reported successful delivery rate was 89.2% among 93 pregnancies women who undergo hemodialysis (Luders, 2018).

Despite its rarity, pregnancy can still occur in women with ESRD, especially with improved dialysis regimens and supportive care (Tangren, 2018). The etiology of ESRD varies and may include diabetic nephropathy, glomerulonephritis, and hypertensive renal disorders, the latter being a common cause in developing countries. Hypertension not only contributes to the progression of kidney failure but also induces significant maternal and fetal risks during pregnancy (Piccoli, G.B, 2016).

Pregnancy in patients with ESRD is associated with increased risks of complications, including preterm labor, intrauterine growth restriction, polyhydramnios, and hypertensive disorders of pregnancy.⁵ These risks are further compounded in women of advanced maternal age (AMA), typically defined as ≥ 35 years, where obstetric outcomes are less favorable due to vascular aging, reduced uterine perfusion, and higher incidence of comorbidities.⁶ Multidisciplinary care and early recognition of pregnancy are crucial in managing such high-risk cases effectively.

LITERATURE REVIEW

Despite these findings, however, the risk of pregnancy in dialysis patients is still considered to be high, posing challenging problems for nephrologists and obstetricians. Pregnancy in dialysis patients has long been considered to be a significant risk factor for mothers and fetuses because of the associated complications, including maternal hypertension, preeclampsia, polyhydramnios,

preterm birth and intrauterine fetal growth restriction. Furthermore, the frequency of irregular menstrual cycle and sexual dysfunction in these patients is high because of various endocrine abnormalities related to impaired renal function, affecting the conception rate (Poppa, 2024). A previous report revealed that hypertension existed in 79% of pregnant patients undergoing hemodialysis, and 32% of them had blood pressure over 170/110 mmHg. Given that maternal hypertension and preeclampsia are major risk factors for prematurity, maternal blood pressure and body fluid levels should be crucially monitored. In addition, polyhydramnios is induced by an increased maternal volume status, which enhances placental blood flow and fetal circulating blood volume, resulting in increased fetal urine output and amniotic fluid volume. Polyhydramnios can also develop due to maternal azotemia and alteration of plasma osmotic pressure during dialysis (Aral, 2020).

RESEARCH METHODOLOGY

The research method used in this case was a qualitative approach through a case study. Data were collected through direct observation, interviews with the patient and the medical team involved, and analysis of medical records and related documents.

RESEARCH RESULT CASE ILLUSTRATION

A 41-year-old gravida 3 para 2 woman with ESRD on chronic hemodialysis presented at 31 weeks of gestation with signs of preterm labor. She had been receiving twice-weekly hemodialysis for the past five years due to advanced chronic kidney disease. The current pregnancy was unplanned and

identified relatively late - at 20 weeks' gestation, as amenorrhea had been presumed secondary to her underlying renal condition. Her obstetric history included two previous term vaginal deliveries with 15-year interpregnancy interval between the birth of the second child and the current pregnancy.

Throughout the antenatal course, the patient remained hemodynamically stable under regular multidisciplinary care involving both nephrology and obstetrics. During the second hour of a scheduled hemodialysis, she reported lower abdominal discomfort and increased uterine contractions. Cervical examination revealed active labor with 3 cm dilatation followed by a bloody show. The hemodialysis session promptly stopped at two hours.

Spontaneous vaginal delivery ensued, resulting in a live infant weighing 1.250 grams, indicating a low birth weight. However, approximately two hours postpartum, the patient developed acute respiratory distress characterized by tachypnea (RR 37/min), oxygen desaturation (SpO₂

85% on nasal cannula), and hypertension (BP 140/98 mmHg). Arterial blood gas analysis revealed metabolic acidosis. She was transferred to the intensive care unit and managed with oxygen via a non-rebreathing mask, intravenous fluids, antihypertensive agents, and diuretics. Urine output during this period was significantly reduced (50 mL/3 hours), and breastfeeding was temporarily withheld.

Within two hours post intervention, the patient's respiratory function improved, with oxygen saturation returning to 100% and resolution of acidosis. Hemodialysis was resumed the following day. By the third postpartum day, she was clinically stable with improved laboratory parameters including hemoglobin from 7.9 g/dL to 8.73 g/dL, serum creatinine from 9 mg/dL to 3.32 mg/dL, and BUN from 87.2 mg/dL to 28.9 mg/dL as well as her blood pressure of 180/90 mmHg. The patient was subsequently discharged in good condition with nephrology follow-up.

DISCUSSION

This patient presents with a long-standing history of chronic hypertension, which ultimately progressed to ESRD, a known complication of sustained hypertensive pathology. Women with ESRD typically exhibit significantly reduced fertility, primarily due to disruptions in the HPO axis. These disturbances may present as hormonal imbalances, including impaired estradiol-induced luteinizing hormone surges and elevated prolactin levels, which further contribute to reproductive dysfunction such as anovulation and menstrual irregularities (Mohd

Rashed, 2016). Despite these reproductive challenges, spontaneous conception remains possible, particularly when residual renal function is preserved and dialysis is optimized (Bhaduri, 2023). However, diagnosis often occurs late, a consequence of menstrual irregularities and prolonged interpregnancy intervals, which was evidenced in this case when pregnancy was identified incidentally at 20 weeks' gestation (Ribeiro, 2020).

Notably, the patient was of AMA, being 41 years old at the time of conception, which independently

confers additional obstetric risk (Hui, 2019). The convergence of ESRD and AMA significantly heightened the risk profile of the pregnancy, predisposing the patient to a spectrum of adverse maternal and fetal outcomes, including spontaneous preterm labor, intrauterine growth restriction (IUGR), and low birth weight (LBW), all of which are well-recognized complications in such clinical scenarios (Rao, 2018). Preterm delivery in dialysis-dependent pregnancies is common, though often medically indicated; spontaneous preterm labor, as occurred in this case during a hemodialysis session, emphasizes the unpredictable nature of such pregnancies. (Jim, 2017) Hemodynamic fluctuations during dialysis, particularly those involving rapid fluid shifts, are believed to exacerbate uterine irritability and precipitate the onset of preterm labor. Therefore, minimizing intradialytic hemodynamic instability is essential, as each episode of hypotension carries a potential risk of placental hypoperfusion and subsequent fetal compromise (Pillay, 2019).

Approximately two hours postpartum, the patient developed respiratory distress and metabolic acidosis, necessitating urgent ICU management. This underscores the importance of close intradialytic and peripartum monitoring to promptly detect and manage potentially life-threatening decompensations.¹⁵⁻¹⁷ Despite these challenges, favorable maternal and neonatal outcomes were achieved. Successful stabilization of both mother and infant highlights the potential for positive outcomes when intensive, multidisciplinary care is employed, consistent with recent recommendations for coordinated management among obstetric,

nephrology, cardiology, and critical care teams to optimize outcomes in this high-risk population.¹⁸⁻²⁰

CONCLUSION

Pregnancy in patients with ESRD remains a clinical rarity due to impaired fertility, yet it is associated with significant maternal and fetal risks when it occurs. This case demonstrates that, despite the presence of multiple risk factors - including ESRD, chronic hypertension, and AMA - favorable maternal and neonatal outcomes can still be achieved. The timely recognition of pregnancy, multidisciplinary coordination, and close peripartum monitoring played pivotal roles in preventing severe complications. Ultimately, this case highlights the importance of individualized and vigilant care in optimizing outcomes for high-risk pregnancies in dialysis-dependent patients.

REFERENCES

- Arai, H., Mori, K. P., Yokoi, H., Mizuta, K., Ogura, J., Suginami, K., ... & Yanagita, M. (2020). Intensified hemodialysis for complicated pregnancy in a primigravida with advanced maternal age: a case report with literature review focusing on appropriate hemodialysis management during pregnancy. *Renal Replacement Therapy*, 6(1), 47. Bhaduri, M., Sarris, I., and Bramham, K. (2023). Female Infertility in Chronic Kidney Disease. *Diagnostics* 13, no. 20: 3216. <https://doi.org/10.3390/diagnostics13203216>
- Bruno Vecchio, R. C., Del Negro, V., Savastano, G., Porpora, M. G.,

- and Piccioni, M. G. (2021). Dialysis on Pregnancy: An Overview. *Women* 1, no. 1: 60-69.
<https://doi.org/10.3390/women1010005>
- Frick AP, (2020), Advanced maternal age and adverse pregnancy outcomes, *Best Practice & Research Clinical Obstetrics and Gynaecology*, <https://doi.org/10.1016/j.bpobgyn.2020.07.005>
- Gorayeb-Polacchini, F. A., Moura, A. F., Luders, C., Moura-Neto, J. A., Leme, J. E. G., da Silva, D. R. (2024). Pregnancy in patients with chronic kidney disease undergoing dialysis: challenges and perspectives. *Jornal Brasileiro de Nefrologia*, [online] 46(1), pp.1-9. Available at: <https://doi.org/10.1590/2175-8239-JBN-2024-0067en>
- Hladunewich, M. A., Melamad, N., & Bramham, K. (2016). Pregnancy across the spectrum of chronic kidney disease. *Kidney International*, 89(5), 995-1007.
[doi:10.1016/j.kint.2015.12.050](https://doi.org/10.1016/j.kint.2015.12.050)
- Hladunewich, M. and Schatell, D. (2016), Intensive dialysis and pregnancy. *Hemodialysis International*, 20: 339-348. <https://doi.org/10.1111/hdi.12420>
- Hui, D., & Hladunewich, M. A. (2019). Chronic Kidney Disease and Pregnancy. *Obstetrics & Gynecology*, 1.
[doi:10.1097/aog.0000000000003256](https://doi.org/10.1097/aog.0000000000003256)
- Jim, B., & Garovic, V. D. (2017). Acute Kidney Injury in Pregnancy. *Seminars in Nephrology*, 37(4), 378-385.
[doi:10.1016/j.semnephrol.2017.05.010](https://doi.org/10.1016/j.semnephrol.2017.05.010)
- Luders, C., Titan, S. M., Kahhale, S., Francisco, R. P., & Zugaib, M. (2018). Risk Factors for Adverse Fetal Outcome in Hemodialysis Pregnant Women. *Kidnaey International Reports*. [doi:10.1016/j.ekir.2018.04.013](https://doi.org/10.1016/j.ekir.2018.04.013)
- Mohd Rashed, H.E., Awaluddin, S.M., Ahmad, N.A., Md Supar, N.H., Md Lani, Z., Aziz, F., Sulaiman, K.A., Masengat, R., Mohd Ithnin, N.I., Othman, Z. and Aris, T., (2016). Advanced maternal age and adverse pregnancy outcomes in Muar, Johor, Malaysia. *Sains Malaysiana*, 45(10), pp.1537-1542. Available at: <https://journalarticle.ukm.my/10299/>
- Oliverio, A. L., & Hladunewich, M. A. (2020). End-Stage Kidney Disease and Dialysis in Pregnancy. *Advances in chronic kidney disease*, 27(6), 477-485.
<https://doi.org/10.1053/j.ackd.2020.06.001>
- Piccoli, G.B., Minelli, F., Versino, E., Cabiddu, G., Attini, R., Vigotti, F.N., Rolfo, A., Giuffrida, D., Colombi, N., Pani, A. and Todros, T., (2016). Pregnancy in dialysis patients in the new millennium: a systematic review and meta-regression analysis correlating dialysis schedules and pregnancy outcomes. *Nephrology Dialysis Transplantation*, 31(11), pp.1915-1934. Available at: <https://academic.oup.com/ndt/article/31/11/1915/2468983>
- Pillay, C., & Clark, K. (2019). Postpartum care of women with renal disease. *Best Practice & Research Clinical Obstetrics & Gynaecology*.
[doi:10.1016/j.bpobgyn.2019.03.008](https://doi.org/10.1016/j.bpobgyn.2019.03.008)

- Popa, C., John, P., Verma, P., Ali, S., & Shah, S. (2024). Pregnancy in Women Receiving Maintenance Dialysis. *Kidney medicine*, 7(3), 100950. <https://doi.org/10.1016/j.xkme.2024.100950>
- Puddu, M., Migueliz, M. L., Rosa-Diez, G., Crucelegui, S., Martínez, A. H., Luxardo, R., ... Canaud, B. (2020). High volume on line hemodiafiltration in dialysis pregnant patients: predilutional or postdilutional? *Journal of Artificial Organs*, 24(3), 392-397. doi:10.1007/s10047-020-01226-4
- Rao, S., & Jim, B. (2018). Acute Kidney Injury in Pregnancy: The Changing Landscape for the 21st Century. *Kidney International Reports*, 3(2), 247-257. doi:10.1016/j.ekir.2018.01.011
- Ribeiro CI, Silva N. Pregnancy and dialysis. *Braz J Nephrol* [Internet]. (2020)Jul;42(3):349-56. Available from: <https://doi.org/10.1590/2175-8239-JBN-2020-0028>
- Sachdeva, M. Barta, V., Thakkar, J., Sakhiya, V., Miller, I. Pregnancy outcomes in women on hemodialysis: a national survey, *Clinical Kidney Journal*, Volume 10, Issue 2, April 2017, Pages 276-281, <https://doi.org/10.1093/ckj/sfw130>
- Srialluri, N., Thavarajah, S. (2024) CKD in reproductive-aged women: a call for early nephrology referral and multidisciplinary care. *BMC Nephrol* 25, 444 <https://doi.org/10.1186/s12882-024-03864-9>
- Tangren, J., Nadel, M., & Hladunewich, M. A. (2018). Pregnancy and End-Stage Renal Disease. *Blood Purification*, 45(1-3), 194-200. doi:10.1159/000485157