

Single Case

Spontaneous Twin Pregnancy: A Challenging and Exceptional Scenario in a Patient on Maintenance Hemodialysis in Sub-Saharan Africa

Mahamat Maimouna^{a, b} Hermine Menye Eban Fouda^b
Victorine Nzana F.^b Aristide Eric Tomta Nono^a Isabelle Nkwelle Mekone^c
Peter Mbala^d François Folefack Kaze^b Gloria Ashuntantang^{a, b}

^aNephrology Service, Yaounde General Hospital, Yaounde, Cameroon; ^bDepartment of Internal Medicine and Specialties, Faculty of Medicine and Biomedical Sciences, University of Yaounde I, Yaounde, Cameroon; ^cDepartment of Pediatrics, Faculty of Medicine and Biomedical Sciences, University of Yaounde I, Yaounde, Cameroon; ^dGynecology and Obstetrics service, Yaounde General Hospital, Yaounde, Cameroon

Keywords

Twin-pregnancy · End-stage kidney failure · Hemodialysis

Abstract

Chronic hemodialysis is associated with reduced fertility. Hence, pregnancy remains rare, challenging, and deleterious when unplanned, especially in low-resource countries. Contraception and births are very important in these settings. Though the main modes of contraception have been proposed in the chronic kidney disease (CKD) population, contraception still remains challenging in patients on maintenance hemodialysis. Most doctors, however, overlook contraception because of the low fertility, high rate of amenorrhea, and low libido. Furthermore, patients are less receptive to contraceptive counseling either because of a high desire to give birth or due to amenorrhea and low libido. Management of unplanned pregnancies is therefore very challenging and a multidisciplinary approach is the rule; however, it does not guarantee a good prognosis for both the mother and child. Very few cases of multiple pregnancies without induction of ovulation have been reported in patients with severe renal failure, especially those on maintenance dialysis. A 32-year-old multiparous woman with end-stage kidney failure (ESKF) and a residual diuresis of 700 mL per day who had been on inadequate maintenance hemodialysis for 36 months, presented with abdominal distension, which was confirmed on abdominal ultrasound to be a twin pregnancy at 22 weeks of gestation. Thereafter, we intensified hemodialysis (3 sessions/week), managed hypertension and

anemia. The obstetrical course was uneventful until the 25th week of gestation when she developed grade 3 (WHO) hypertension and peripheral fluid overload. At the 29th week, she had a spontaneous vaginal preterm delivery of 2 babies weighing 1,350 g and 1,000 g, with an Apgar score of 8 and 7, respectively. Babies, however, died on day 1 and day 5 postpartum, respectively, from respiratory distress and early neonatal infection. The evolution of the mother was uneventful as she continued with her hemodialysis sessions. Twin pregnancies are a rare and very high-risk condition in end-stage renal disease and require multidisciplinary management.

© 2022 The Author(s).
Published by S. Karger AG, Basel

Background

Pregnancy is a relatively rare clinical condition in chronic kidney disease (CKD) and almost exceptional in end-stage kidney failure (ESKF) [1, 2]. The physiological changes, particularly the decrease in fertility, loss of libido, anovulation, and hormonal disorders observed in CKD, are not greatly influenced by renal replacement therapy [3]. Generally, pregnancies in renal patients are unplanned. Amenorrhea is frequent and contraception is not common [4]. Despite this low conception rate, they reported that pregnancy has been reported in 1–7% of women on dialysis [5]. Furthermore, due to the high maternal-fetal risk, pregnancy was generally discouraged in women undergoing dialysis, thus contributing to the low frequency of pregnancies until the last few decades, where longer gestation and an increased likelihood of a successful pregnancy have been reported with dialysis intensification [6]. In sub-Saharan Africa, limited access to quality dialysis care, renders pregnancy even very unusual in women on dialysis. Despite the younger age, we report the case of a 32-year-old lady with ESKF on sub-optimal maintenance hemodialysis for 3 years who spontaneously became pregnant.

Case Presentation

In February 2021, a 32-year-old female patient who had been on maintenance hemodialysis in our unit for the past 3 years, presented with a 1-month history of a painless progressive abdominal distension associated with weight gain. She had no associated digestive symptoms. She had end-stage kidney failure (ESKF) of unknown etiology which was diagnosed in June 2019, and was placed on maintenance hemodialysis. She was receiving a one 4-h weekly dialysis session due to financial constraints. She had a history of multiparity (5 pregnancies) with a twin pregnancy prior to ESKF and secondary amenorrhea for the last 2 years on hemodialysis. Her residual diuresis was 700 mL. Her anemia was treated with iterative blood transfusions and her blood pressure was controlled using nifedipine and labetalol. The initial clinical evaluation revealed: asthenia, no dizziness nor palpitation; arterial hypertension grade 1 (WHO); absence of signs of fluid overload; abdominal-pelvic mass, mobile with respiration; and no murmurs. The cardiovascular and respiratory evaluations were unremarkable. The hemoglobin (Hb) level was 8.4 g/dL, the phosphorus level at 3.2 mg/dL and the calcium level at 8.8 mg/dL. Protein catabolic rates (nPCR), Kt/V, blood gas analysis, and calcium phosphate metabolism were not done due to financial constraints. A pelvic ultrasound revealed a normal evolving intrauterine pregnancy. Obstetric ultrasound showed a dichorionic diamniotic twin pregnancy of 379 g and 450 g with an estimated gestational age of 22 weeks with

no morphological or amniotic fluid abnormalities. A weekly intravenous dose of 100 mg of elemental iron, 8,000 IU of erythropoietin, 25 mg of oral folic acid, and a daily oral dose of 100 mg of acetylsalicylic acid were added to her treatment. A free diet with low potassium and sodium was recommended. The evolution was marked by a progressive increase in blood pressure from the 25th week of gestation and peripheral fluid overload, which was managed by thrice weekly dialysis sessions (12 h/week) and the addition of alpha methyl dopa to her antihypertensive therapy. At the 28th week of pregnancy, her Hb level was 10.2 g/dL and her blood pressure was well controlled. A week later, she went into spontaneous premature labor and delivered 2 live babies despite tocolysis. The babies weighed 1,350 g and 1,000 g with an Apgar score of 7 and 8, respectively. The babies were immediately transferred to a nearby pediatric hospital with a neonatal unit. Evaluation revealed no malformations. Neonate 1 (a girl) had severe respiratory distress probably from meconium aspiration; she died at the 5th hour with no improvement of respiratory state despite aspiration of airways, oxygenation, and corticotherapy. Neonate 2 (a boy) had mild respiratory distress and developed a continuous low grade fever; he was suboptimally treated for an early neonatal infection and, due to unaffordability of antibiotic delivery, he died on day 5.

The follow-up with the lady was uneventful. The peripartum and postpartum periods were unremarkable with no complications. Blood pressure was well controlled on the same treatment, with normal vaginal bleeding and a good mental state.

Discussion

The originality of our case lies in the occurrence of a spontaneous twin pregnancy in a patient with a 2 years secondary amenorrhea on maintenance hemodialysis for 363 years and the challenge of care in a limited resource setting. Despite the known reduced fertility rate, pregnancy on hemodialysis seems to be slightly more frequent in recent years due to improved techniques and more efficient team management in high-income countries [7]. However, the situation is different in Africa: Chaker et al. [8] over a period of 34 years reported 25 successful pregnancies in Tunisia, whereas over a shorter period of 14 years, 616 pregnancies were reported in Canada [1]. In Cameroon, an observational study over 11 years found a prevalence of 7.14% of pregnancies in hemodialysis (6 pregnancies in 84 women) [9]. This low prevalence here could be explained by the nonoptimal conditions in hemodialysis that do not favor conception as described in the literature: dialysis duration, optimal treatment of anemia, adequate nutrition, and hemodynamic stability [1, 10]. Thus, the spontaneous occurrence of twin pregnancy with maintenance up to 29 weeks in a patient receiving only 4 h hemodialysis a week, with suboptimal medical treatment, seems very surprising. However, the residual diuresis of 700 mL and the absence of uremic signs despite suboptimal dialysis in this patient probably suggest an acceptable residual renal function. Residual diuresis is a factor that favors pregnancy in the dialysis patient who is less fertile, compared to women of the same age [11].

Both the occurrence and the diagnosis of pregnancy are a real challenge in CKD. Indeed, in this population, ultrasound seems to be the only clear diagnostic tool compared to the β -HCG assay, whose level rises with a decrease in renal function [12]. The diagnosis of pregnancy was rather late, because her amenorrhea was not a new finding and she had no suggestive symptoms. Only an increase in abdominal volume was the key, as reported in 8% of patients in Tunisia [8]. In Cameroon, the average age of diagnosis of pregnancy is 15.8 ± 4.02 weeks and no case of multiple pregnancy has been reported previously in the hemodialysis population [9]. Similarly, only a few cases of spontaneous twin pregnancy have been reported worldwide [13, 14].

Though management of pregnancy on dialysis remains challenging, conception and contraception are not priorities during the care of women on ESKF. Contraceptives are not

standard care due to the presence of amenorrhea, low fertility, low libido, and side effects of medications. Contraception is however mandatory to avoid unplanned pregnancy and its consequences, though most ESKF females remain reluctant to this counseling [15]. In this patient with a 2 year history of amenorrhea, pregnancy was least expected.

Twin pregnancy is a high-risk condition even in the absence of renal disease and is associated with a higher risk of preterm delivery, especially in the presence of CKD [6, 16]. We observed a preterm delivery in this patient with neonatal death. In pregnant hemodialysis women, fetal malformations are less frequent but the risk of neonatal death is significant [12]. Many factors in this patient can explain the poor outcome of her pregnancy. The late diagnosis of pregnancy, financial constraints, and consequently late increment of dialysis dose without attaining 36 h per week, anemia, and lack of phosphorus supplements may explain the poor outcome. There is evidence that an intensified dialysis regimen and drug therapy, including blood pressure control and anemia correction, improve the maternal-fetal prognosis in hemodialysis [6, 10, 17]. Our patient did not present a worsening of anemia, which is associated with an increased risk of prematurity [16, 18]. In recent years, the median gestational age of pregnancies in patients undergoing hemodialysis has increased to 33.8 weeks with a consequent increase in neonatal survival [12], but the survival of the newborn remains poor [11]. Prematurity observed here is not exceptional and fetal survival implies imperative neonatal care preparation from the beginning of the pregnancy. In Cameroon, despite some progress, multiple gestation remains a risk factor for preterm birth and low birth weight, which remain the main causes of neonatal deaths [19, 20]. Also, the high out-of-pocket health care expenditure [21] may have contributed to the poor prognosis and outcome of this case.

Conclusion

In hemodialysis, contraception remains necessary, conception is rare but possible, and management of an unplanned pregnancy is more challenging in low-resource settings. Multiple pregnancies have not yet been described in Cameroonian women on hemodialysis. Pregnancy in this population is high-risk, with a higher risk for multiple pregnancies; hence, multidisciplinary management to improve the materno-fetal prognosis should be a gold standard, but also financial resources to adhere to the exigencies of care.

Statement of Ethics

This study was approved by the Ethics Committee of Yaounde General Hospital. Date of approval: July 13, 2021. Written informed consent was obtained from participant for publication of the details of their medical case.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Funding Sources

The authors received no financial support for the research, authorship, and/or publication of this article.

Author Contributions

Mahamat Maimouna, Victorine Nzana, Aristide Eric Tomta Nono, and Peter Mbala performed the follow-up of the patient. Isabelle Nkwelle Mekone did the follow-up of the fetuses. Mahamat Maimouna, Hermine Menye Ebana Fouda, and Victorine Nzana F. wrote the manuscript. Gloria Ashuntantang, Hermine Menye Ebana Fouda, and François Folefack Kaze read and approved the final manuscript.

Data Availability Statement

The data that support the findings of this study are included in this article. Further inquiries can be directed to the corresponding author.

References

- 1 Tangren J, Nadel M, Hladunewich MA. Pregnancy and end-stage renal disease. *Blood Purif*. 2018;45(1–3):194–200.
- 2 Zhang JJ, Ma XX, Hao L, Liu LJ, Lv JC, Zhang H. A systematic review and meta-analysis of outcomes of pregnancy in CKD and CKD outcomes in pregnancy. *Clin J Am Soc Nephrol*. 2015 Nov;10(11):1964–78.
- 3 Ahmed SB, Ramesh S. Sex hormones in women with kidney disease. *Nephrol Dial Transplant*. 2016 Nov;31(11):1787–95.
- 4 Schmidt RJ, Holley JL. Fertility and contraception in end-stage renal disease. *Adv Ren Replace Ther*. 1998 Jan;5(1):38–44.
- 5 Sachdeva M, Barta V, Thakkar J, Sakhiya V, Miller I. Pregnancy outcomes in women on hemodialysis: a national survey. *Clin Kidney J*. 2017 Apr;10(2):276–81.
- 6 Piccoli GB, Minelli F, Versino E, Cabiddu G, Attini R, Vigotti FN, et al. Pregnancy in dialysis patients in the new millennium: a systematic review and meta-regression analysis correlating dialysis schedules and pregnancy outcomes. *Nephrol Dial Transplant*. 2016 Nov;31(11):1915–34.
- 7 Chao AS, Huang JY, Lien R, Kung FT, Chen PJ, Hsieh PC. Pregnancy in women who undergo long-term hemodialysis. *Am J Obstet Gynecol*. 2002 Jul;187(1):152–6.
- 8 Chaker H, Masmoudi S, Toumi S, Dammak N, Hachicha J, Kammoun K, et al. La grossesse en hémodialyse chronique: à propos de 25 cas survenus dans le Sud Tunisien. *Pan Afr Med J*. 2020;36:195.
- 9 Ashuntantang Enow G, Ebana Fouda H, Kemfang JDN, Mahamat M, Mambap AT, Kaze FF. Frequency and outcome of pregnancy in women after commencing maintenance hemodialysis in Sub-Saharan Africa: an observation from a single center. *Health Sci Dis*. 2014;15(3). Available from: <https://www.hsd-fmsb.org/index.php/hsd/article/view/426>.
- 10 Bruno Vecchio RC, Del Negro V, Savastano G, Porpora MG, Piccioni MG. Dialysis on pregnancy: an overview. *Women*. 2021 Jan;1(1):60–9.
- 11 Giatras I, Levy DP, Malone FD, Carlson JA, Jungers P. Pregnancy during dialysis: case report and management guidelines. *Nephrol Dial Transplant*. 1998 Dec;13(12):3266–72.
- 12 Manisco G, Potì M, Maggiulli G, Di Tullio M, Losappio V, Vernaglione L. Pregnancy in end-stage renal disease patients on dialysis: how to achieve a successful delivery. *Clin Kidney J*. 2015 Jun;8(3):293–9.
- 13 Alix PM, Brunner F, Jolivot A, Doret M, Juillard L. Twin pregnancy in a patient on chronic haemodialysis who already had three pregnancies. *J Nephrol*. 2019 Jun;32(3):487–90.
- 14 Medeiros R, Paisde MSJ, Freitas L, Moura P. Gravidez e Hemodiálise: a Propósito de uma Gravidez Gemelar Bem Sucedida. *Acta Médica Port*. 2021 Jan;34(1):56.
- 15 Attini R, Cabiddu G, Montersino B, Gamaro L, Gernone G, Moroni G, et al. Contraception in chronic kidney disease: a best practice position statement by the Kidney and Pregnancy Group of the Italian Society of Nephrology. *J Nephrol*. 2020 Dec;33(6):1343–59.
- 16 Chan WS, Okun N, Kjellstrand CM. Pregnancy in chronic dialysis: a review and analysis of the literature. *Int J Artif Organs*. 1998 May;21(5):259–68.
- 17 Al-Saran KA, Sabry AA. Pregnancy in dialysis patients: a case series. *J Med Case Rep*. 2008 Dec;2(1):10.
- 18 Levy A, Fraser D, Katz M, Mazor M, Sheiner E. Maternal anemia during pregnancy is an independent risk factor for low birthweight and preterm delivery. *Eur J Obstet Gynecol Reprod Biol*. 2005 Oct;122(2):182–6.
- 19 Noukeu Njinkui D, Enyama D, Ntsoli Kofane G, Djike Puepi Y, Mbakop Tchogna C, Bissa MC, et al. Determinants of neonatal mortality in a neonatology unit of a referral hospital in Douala (Cameroon): Neonatal mortality in a neonatology unit at Douala. *Health Sci Dis*. 2021 Oct [cited 2021 Dec 26];22(10). Available from: <https://www.hsd-fmsb.org/index.php/hsd/article/view/3017>.

- 20 Sap Ngo Um S, Kana SP, Ngo Njock V, Abondo G, Koki PO. Mortality of low birth weight neonates in a tertiary care centre of Yaounde (Cameroon). *Health Sci Dis*. 2020 Jan [cited 2021 Dec 26];21(2). Available from: <http://hsd-fmsb.org/index.php/hsd/article/view/1828>.
- 21 Halle MP, Jimkap NN, Kaze FF, Fouda H, Belley EP, Ashuntantang G. Cost of care for patients on maintenance haemodialysis in public facilities in Cameroon. *Afr J Nephrol*. 2017 Mar;20(1):230–37.