

Innovative Journeys to Motherhood: Option of Home Dialysis for Women With Advanced Kidney Disease or Kidney Failure



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Many women with advanced chronic kidney disease (CKD) or kidney failure requiring dialysis may aspire to achieve motherhood. Women may face a lack of clinician support and limited or delayed counselling, a narrow window of time for child-bearing, often exacerbated by recommendations to postpone conception until after kidney transplantation, thereby potentially missing their child-bearing years.¹ Navigating these complexities when planning the best timing of a pregnancy involves consideration of CKD progression with pregnancy, risks to mother and baby, clinician experience in managing pregnancies in women with advanced CKD or on dialysis, and capacity to undertake high-risk pregnancy care in a health system under resource pressures.² Although fertility is generally

low in women with advanced CKD or kidney failure, the initiation of effective dialysis and correction of anemia have the potential to enhance ovulation, increasing the chances of unplanned pregnancies. The widespread assumption of infertility by both women and clinicians may underpin low contraception uptake among women with kidney failure, also contributing to unplanned pregnancies.³

Pregnancies, either planned or unplanned, in women with advanced kidney failure or undergoing dialysis are rare but consistently shown to be increasing.^{1,4,5} In the modern era in high resource settings, live birth rates are much improved; however, these pregnancies remain high-risk for both the mother and baby.⁶ Despite these higher risks, growing acceptance of pregnancy on dialysis is propelled by increased experience and advancements in care models. Intensive hemodialysis regimens, tailored to residual renal function

and optimal clearances, yield improved maternal health, fertility, better live birth rates, prolonged gestation, and higher birth weights.⁷ Delivering intensive hemodialysis, especially nocturnal or home-based hemodialysis, emerges as a viable option for women with kidney failure aspiring to conceive or achieve healthier pregnancies (Figure 1). Pregnancy in peritoneal dialysis recipients is even more rare,¹ but increasingly recognized as a potential option, especially in early pregnancy. The global surge in initiatives advocating for and facilitating the adoption of home-based dialysis is gaining traction, offering potential advantages for achieving motherhood (Figure 1).

Therefore, the study by Shah *et al.*,⁸ is a highly timely and relevant exploration of pregnancy rates and influencing factors among women on home hemodialysis and peritoneal dialysis. The study included 437 pregnancies (328 in peritoneal dialysis recipients and 109 in home hemodialysis recipients) carefully identified via diagnostic coding data within the United States Renal Data System from 2005 to 2018. This represents a major advance in our knowledge about pregnancies in women receiving home-based dialysis. Shah *et al.*⁸ found 2.3-fold higher pregnancy rates in women undergoing home hemodialysis in comparison to those receiving peritoneal dialysis. Notably, pregnancy rates were higher in younger individuals (aged 20–24 years) and among Black women, with no significant differences observed among women from other ethnic backgrounds. Other maternal factors such as body mass index, cause of kidney failure, socioeconomic status, rurality, predialysis

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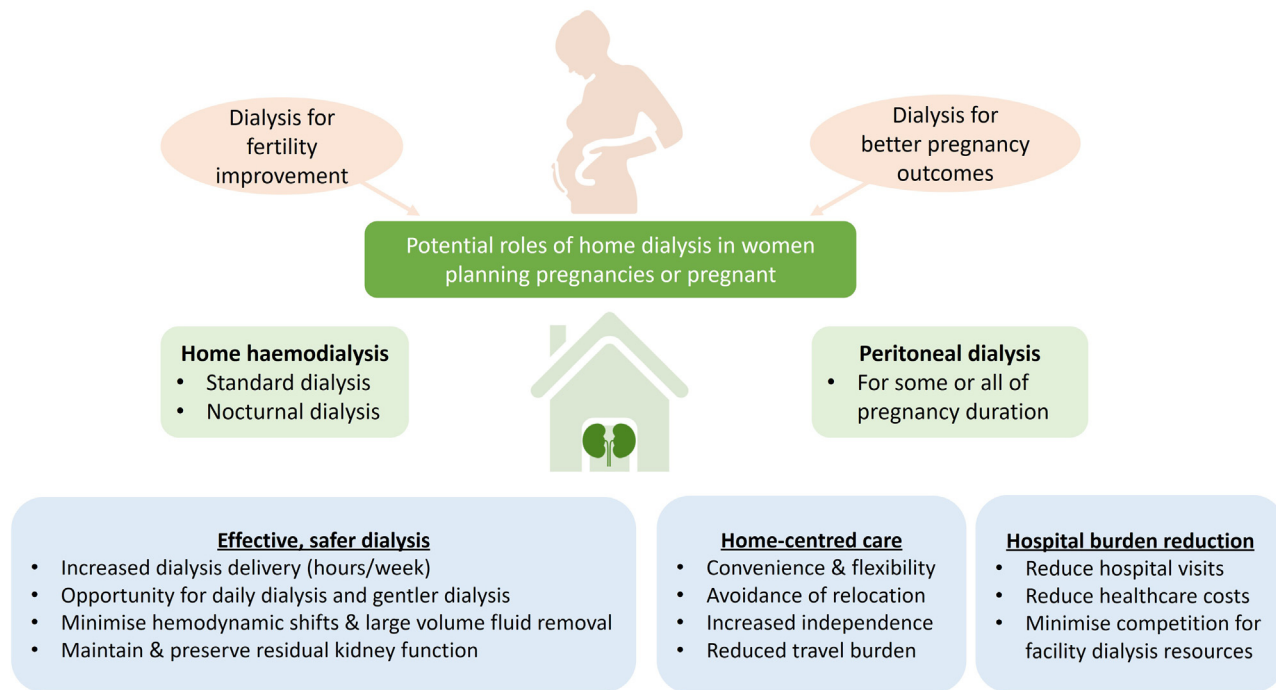


Figure 1. Advantages of home-based dialysis in pregnancy planning and care.

nephrology care, and dialysis vintage were not associated with pregnancy rates. The absolute proportion of live births was 36.7% by home hemodialysis recipients and 30% by peritoneal dialysis recipients. Adjusted live birth rates were doubled in women on home hemodialysis (5.9 pregnancies per 1000 person-years, 95% confidence interval: 4.2–8.0) compared to peritoneal dialysis (2.3 pregnancies per 1000 person-years, 95% confidence interval: 1.9–2.8), and stillbirth and therapeutic abortions rates were relatively low. This is the largest study of pregnancies in home dialysis recipients; however, there are important limitations to note, including those inherent in population-level datasets and diagnostic coding data where missing data is often a significant issue. Pregnancy outcome was unknown in 40% of cases, especially in the peritoneal dialysis cohort. Furthermore, the study did not report rates of dialysis modality change from peritoneal dialysis to hemodialysis, which is clinically

often the default therapeutic measure during pregnancy. The authors did not have data on fetal outcomes, maternal pregnancy complications, dialysis regimens, peritoneal dialysis complications, and the influence of health literacy, contraception use and assisted reproductive technique use on pregnancy rates. These remain important questions to address in future research.

Home-based dialysis for pregnancy is certainly feasible; however, its suitability varies for women in different settings and circumstances. It is a patient-centric approach offering flexibility, autonomy, and the convenience of care at home for selected women (Figure 1). This may particularly be of advantage to women in rural settings, in regions where hospital-based dialysis capacity is already stretched, women with other children who need care, or those who cannot relocate to major centers for the duration of pregnancy. Reduced dependence on hospital facilities for even part of the pregnancy contributes to

lower healthcare cost and pressure on resources. In addition, intensive peritoneal dialysis, daily shorter-hours hemodialysis, or nocturnal dialysis are treatment regimens that may assist in minimizing hemodynamic shifts through gentler ultrafiltration rates. This may mitigate dialysis-related hypotension and low placental perfusion, while improving clearances.

Implementing home-based dialysis during pregnancy also poses challenges. Uptake and access will be limited by local availability and practices, clinician and patient confidence and appetite for home therapies, patient concerns about self-management, health literacy, and clinical stability during pregnancy.⁹ The fluctuating physiological demands of pregnancy, coupled with the need for meticulous monitoring and adjustments in dialysis prescriptions, create a complex scenario for home hemodialysis. Similarly, commencing or continuing peritoneal dialysis may be limited by catheter complications, restricted intraabdominal space as the gravid uterus enlarges, or

inadequate clearances especially in women with less residual kidney function. Balancing dialysis effectiveness while prioritizing maternal and fetal well-being demands specialized expertise and close clinical oversight. Managing home dialysis during pregnancy may introduce stress, impacting the overall experience. Addressing logistical considerations and potential disruptions at home is essential for effective home dialysis during pregnancy. This is where remote monitoring and telehealth technology may be increasingly used to support women to dialyze at home for as long as possible without compromising medical oversight.

For home dialysis to be successful during pregnancy, a culture of embracing home-based therapies is essential. This requires comprehensive education and training for both nephrologists, women, their partners, and families. Shared decision-making, weighing potential benefits against patient preferences, and mapping the pregnancy plan is crucial. A highly supportive multidisciplinary team (nephrologists, dialysis nurses, obstetricians, and allied health) is pivotal for comprehensive care and ensuring optimal outcomes. Further research is needed to fully understand the landscape of home-based dialysis and pregnancy outcomes, impact of modality changes during pregnancy, dialysis complications, as well as patient and clinician perspectives, to inform future clinical practices.

Reproductive autonomy is a fundamental aspect of healthcare for women with CKD of all stages. The work of Shah *et al.*⁸ has

highlighted that programs advocating for home dialysis holds the potential to improve accessibility and health outcomes, particularly for individuals aspiring to pregnancy. Although home dialysis and its potential benefits for pregnancy outcomes are acknowledged, in centers where nephrology care and dialysis access are limited, supporting pregnancy with home-based dialysis may not be an option.

Reproductive decisions are deeply personal choices that demand early and comprehensive counseling and support in women with CKD. Irrespective of the setting, raising pregnancy with all women, promoting contraception use, and avoiding unplanned pregnancy remains the mainstay of care for all women with CKD. Addressing these issues is imperative to uphold the principles of reproductive autonomy universally. As the discourse on global kidney care advances, ensuring equitable access to kidney care for women emerges as a broader consideration, and efforts to bridge gaps in care and ensure the well-being of women with CKD, particularly during and after high-risk pregnancy, is a global priority.

DISCLOSURE

All the authors declared no competing interests.

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