Preconception Counseling for Women with Chronic Kidney Disease

By Mala Sachdeva

The prevalence of chronic kidney disease (CKD) is slightly higher in women than men. Women of childbearing age make up a small, yet important portion of this population (1, 2). Asking women in this age group about their future family plans can prevent unplanned pregnancies, provide timely education and intervention, and decrease adverse fetal and maternal outcomes associated with CKD. Still, for some women or for some nephrologists, speaking about pregnancy may be an uncomfortable and unfamiliar topic of conversation during an office visit. Discussed below are pertinent topics of conversation that can allow nephrologists to start an impactful conversation with their patients (Table 1).

Timing of pregnancy should be discussed so that pregnancies can be planned. This can be dependent on numerous factors, such as remission or relapse of their underlying glomerular disease, control of hypertension, rate of progression of their current kidney disease, age, and their status for kidney transplantation. If glomerular disease is in remission for 6 months to 1 year, it may be an ideal time to try to conceive. If the rate of kidney function decline is rapid, then pregnancy should be postponed, as CKD progression may accelerate. Ideally, if kidney transplantation is possible, then postponing pregnancy until 1–2 years post-transplantation would be preferred. Still, post-transplantation pregnancies carry their own maternal and fetal risks, including preterm deliveries, cesarean sections, preeclampsia, gestational diabetes, and pregnancy-induced hypertension (3). Likewise, if age permits, pregnancy can be postponed until the patient is well optimized.

For women who are not planning pregnancy, conversations regarding contraception should be initiated, and these can be followed up with more detail provided by a gynecologist. Individual preference, timing of conception, adherence to medications, along with underlying comorbid conditions, such as hypertension, thrombogenic conditions, and CKD, should be taken into consideration when discussing risks and benefits of certain contraceptive methods (4). Different methods of contraception are provided in Table 2.

Fertility is an important topic to consider in women with CKD. This is of particular concern with past use of medications, such as cyclophosphamide, or even living with CKD, which can impact fertility potential. When treating women of childbearing age, nephrologists need to be mindful of what the woman's future family plans are so that fertility can be preserved as much as possible. If a woman chooses the use of assisted reproductive technologies (ARTs) to aid infertility, similar preconception counseling and assessment should be performed before beginning any ART. ART comes with inherent risks to the mother and fetus, which are likely similar to those for CKD yet not completely understood (5). ART increases risk of hypertensive disorders of pregnancy, including preeclampsia, preterm deliveries, and low birth-weight infants (6).

Laboratory testing to help prognosticate kidney outcome, as well as maternal and fetal outcomes, should be appropriately performed. Pre-pregnancy, 24-hour urine for proteinuria, creatinine clearance, and serum creatinine levels can all help with counseling. Checking hemoglobin A1c levels will be helpful for those with diabetes mellitus. Assessing autoimmune activity in patients with lupus vasculitis, for example, should be performed. Since challenges of performing a kidney biopsy during pregnancy exist in women with proteinuria of undetermined etiology, performing a kidney biopsy pre-pregnancy may be indicated to ensure there is a pre-pregnancy glomerular diagnosis so that appropriate therapy can be initiated during pregnancy if indicated. Likewise, in women with advanced CKD, performing a kidney biopsy may help prognosticate their post-pregnancy kidney outcome, as well as offer treatment if the disease progresses during pregnancy.

Based on lab assessment, it is important to discuss risk with these women. Some women may be oblivious to the risks that their kidney disease poses on a pregnancy. Risks of relapse, progression of their underlying kidney disease or proteinuria during pregnancy, and adverse outcomes of CKD to the mother and fetus should all be discussed. Women with CKD have a higher likelihood for preterm deliveries, gestational hypertension, preeclampsia or eclampsia, and cesarean sections (7). Adverse fetal outcomes include small gestational-age and lower birth-weight infants and increased admissions to neonatal intensive care units (8).

Appropriate medication adjustments should be made before conception. In women treated with immunosuppressive agents, such as mycophenolate mofetil, whether for post-transplantation or for the treatment of glomerular disease, pregnancy should ideally be postponed until teratogenic medications are successfully removed for a reasonable amount of time or substituted for non-teratogenic agents. Similarly, women who are being treated with antihypertensive agents that are teratogenic, such as angiotensin-converting enzyme inhibitors or angiotensin II receptor blockers, should be switched to other, safer alternatives, such as labetalol, hydralazine, calcium channel antagonists (e.g., nifedipine), or methyldopa. Blood pressure should be followed up to ensure optimal control preconception. Sodium-glucose cotransporter-2 inhibitors have been shown to affect kidney development in animal studies, especially in the second and third trimesters; hence, these medications should be avoided until more is known about their use in pregnancy. Diuretics should be used with caution to

Table 1. Components of preconception counseling

Discussion on the timing of pregnancy
Contraception counseling
Assessment of fertility status
Use of assisted reproductive technologies
Medication reconciliation
Assessment of kidney disease, kidney function, and proteinuria
Control of blood pressure
Counseling on adverse fetal and maternal outcomes associated with CKD
Referral to appropriate subspecialists
Referral to high-risk obstetrician

Table 2. Types of contraception

	Short-acting contraception	Long-acting, reversible contraception	Permanent contraception
Progestin only	Depo-Provera injection	Levonorgestrel intrauterine device (LNG IUD)	
	Progestin-only pills	Etonogestrel implant (ENG implant)	
Combined estrogen/ progestin	Combined oral contraceptive pills		
	Transdermal patch		
Non-hormonal methods	Male or female condoms	Copper IUD	
	Diaphragms		
	Vaginal sponges		
	Cervical caps		
Surgical			Sterilization vasectomy
			Tubal ligation
			Salpingectomy

prevent volume depletion. Since CKD is a risk factor for preeclampsia, low-dose aspirin is ideally initiated before 16 weeks gestation to decrease risk (9).

One nephrology office visit can suffice to initiate and discuss most issues that encompass preconception counseling. Follow-up on the recommendations from this visit are still recommended. Referral to a high-risk obstetrician and other subspecialists in a timely manner can further supplement appropriate preconception counseling and stratification. ■

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Hypertension Management During Pregnancy

By Kelli King-Morris

Hypertension during pregnancy is defined as a systolic blood pressure >140 mm Hg or a diastolic blood pressure ≥90 mm Hg on two separate occasions at least 4 hours apart. Hypertension complicates 10% of pregnancies worldwide (1). Classically, the presence of hypertension prior to 20 weeks gestation has been attributed to the presence of preexisting, essential hypertension. However, with an aging maternal population, rising obesity rates, and the success of fertility improving in those with chronic illness, the development of earlier onset blood pressure derangements is notable (2). The Survey of Neonates in Pomerania (SNiP) study found that 27% of American women of childbearing age experienced one or more chronic diseases (3).

Healthy maternal alterations in prostaglandins, activation of the renin-angiotensin-aldosterone system (RAAS), and a subsequent increase in glomerular filtration rate typically result in lowering of maternal systemic blood pressure. One can expect up to a 0.4- to 0.8-mg/dL reduction in serum creatinine and lowering of approximately 10 mm Hg in blood pressure by the second trimester, with mean values of 105/60 mm Hg (4). Markers of preeclampsia, either superimposed or de novo, include the development of new-onset hypertension, reduced kidney function, thrombocytopenia, pulmonary edema, or neurologic symptoms, such as headache or visual stigmata. The glomerular endotheliosis present with preeclampsia is associated with sodium retention despite intravascular depletion (5). Placental factors have been implicated in its development.

Pharmacologic treatment of hypertension during pregnancy remains largely unchanged in this population. Treatment mainstays are non-dihydropyridine calcium channel blockers, β-blockers, clonidine, and, now less commonly, the centrally acting α-2 adrenergic agonists (methyldopa) (Table 1). Postpartum care may include RAAS blockade agents, such as enalapril, which has been documented to have less accumulation for lactating mothers. In 2022, the investigators of the Chronic Hypertension and Pregnancy (CHAP) trial found that using 140/90 was a threshold for initiation or titration of medical therapy for chronic hypertension in pregnancy, rather than the previously recommended threshold of 160/110 (6). In the setting of preeclampsia-induced hypertension, magnesium sulfate infusion triggers vasodilation affecting blood pressure reduction and particularly cerebral events and prevention of eclamptic events (7).

Long-term cardiovascular complications of hypertension experienced during pregnancy are becoming more well established. Once exposed to gestational hypertension or preeclampsia, the risk of subsequent hypertension was increased 5.3-fold (range, 4.9–5.8) after gestational hypertension, 3.6-fold (range, 3.4–3.8) after mild preeclampsia, and 6.1-fold (range, 5.5–6.8) after severe preeclampsia. Of those with chronic hypertension, 25% will develop preeclampsia (8). Primary prevention strategies for cardiovascular morbidity or mortality may be warranted for those who have experienced a hypertensive disorder in pregnancy (9). ■

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Table 1. Pharmacologic treatment of hypertension during pregnancy

Antihypertensive	Dosing strategy
Oral	
Nifedipine	20–120 mg/day once daily or in two divided doses
Labetalol	300–2400 mg/day in three or four divided doses
Clonidine	0.1–0.3 mg orally two to three times daily
Methyldopa	500–2000 mg/day in three or four divided doses
Intravenous[a]	
Hydralazine	5 mg IV bolus; then if needed, 5–10 mg IV to a maximum of 45 mg
Labetalol	20 mg IV; then if needed, 40 mg and then 80 mg to a maximum of 300 mg

IV, intravenous. Adapted from Mol et al. (8).
[a]Reserved for severe hypertension (blood pressure >160/110 mm Hg).