Thanks to our speaker!

Dr. Jessica Tangren
Nephrologist, Massachusetts General Hospital

- Research in women’s health with a particular focus on pregnancy in women with kidney disease
- 2017 AKF CSN fellowship recipient
Reproductive Health, Pregnancy and Chronic Kidney Disease

Jessica Sheehan Tangren, MD
Pregnancy and CKD

• Having a child is a life goal for many women – this does not change for women with chronic kidney disease (CKD)
• Women with CKD are at higher risk for complications including:
  – Preeclampsia
  – Restricted growth of fetus
  – Early delivery
  – Worsening of CKD
Pregnancy and CKD

- Women with CKD face difficult emotional decisions about pregnancy
  - Perceived risks to own health
  - Perceived risks to baby
  - Burden on family members
Women’s Perspectives

• “I was diagnosed with CKD stage 3 from ADPKD two years after I got married. If my husband had known I may not be able to have children, I wonder if he would still have married me.”

• “I remember overhearing my pediatrician tell my mother that I should never have children. This feeling of emptiness has been with me my whole life. I don’t think he realized the impact that those words have had on me all these years.”
Women’s Perspectives

• “Am I selfish to want a baby? If something is wrong with the baby, it will be my fault. I’m not sure if I can live with that.”

• “The doctors think I’m crazy to want to have another child after all of the complications during pregnancy with my daughter. I know my life is going to be shorter because of my kidney disease. I want my daughter to have a sibling to lean on. I don’t want her and my husband to be all alone when I am gone.”
Objectives

• Fertility across the spectrum of CKD
• Pregnancy Risk Assessment and Counseling
  – How does pregnancy affect kidney disease?
  – How does CKD affect pregnancy?
• Special considerations
  – Diabetic kidney disease, lupus, kidney transplant
## Definitions

- **CKD Classification**
  - Stage 1-5
  - Early vs. Advanced Stage
- **CKD Progression**
  - Increasing CKD Stage

### STAGES OF CHRONIC KIDNEY DISEASE

<table>
<thead>
<tr>
<th>STAGE</th>
<th>Description</th>
<th>GFR*</th>
<th>% of Kidney Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Kidney damage with <strong>normal</strong> kidney function</td>
<td>90 or higher</td>
<td>90-100%</td>
</tr>
<tr>
<td>Stage 2</td>
<td>Kidney damage with <strong>mild loss</strong> of kidney function</td>
<td>89 to 60</td>
<td>89-60%</td>
</tr>
<tr>
<td>Stage 3a</td>
<td>Mild to moderate <strong>loss</strong> of kidney function</td>
<td>59 to 45</td>
<td>59-45%</td>
</tr>
<tr>
<td>Stage 3b</td>
<td>Moderate to severe <strong>loss</strong> of kidney function</td>
<td>44 to 30</td>
<td>44-30%</td>
</tr>
<tr>
<td>Stage 4</td>
<td><strong>Severe</strong> loss of kidney function</td>
<td>29 to 15</td>
<td>29-15%</td>
</tr>
<tr>
<td>Stage 5</td>
<td><strong>Kidney failure</strong></td>
<td>Less than 15</td>
<td>Less than 15%</td>
</tr>
</tbody>
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*Your GFR number tells you how much kidney function you have. As kidney disease gets worse, the GFR number goes down.*

[https://www.kidney.org/atoz/content/gfr](https://www.kidney.org/atoz/content/gfr)
Fertility in Chronic Kidney Disease
Fertility in CKD

- Fertility declines in *advanced* chronic kidney disease
  - Menstrual irregularities when GFR < 15
  - Many women on dialysis no longer have normal periods or have “anovulatory” cycles
  - Elevated BUN, reduced clearance of certain hormones (prolactin), low levels of estrogen and progesterone
Fertility in CKD

Wiles, K. S. et al. (2018) Reproductive health and pregnancy in women with chronic kidney disease
Fertility in CKD

- Pregnancy *can occur* at all CKD stages and in kidney transplant recipients
  - Kidney transplantation
  - Intensified hemodialysis

- Birth control important to prevent unplanned pregnancies
  - Teratogenic medications (post-transplant, glomerular disease treatment)
  - IUD and progesterone-only pill safest methods
How will a pregnancy impact my kidneys?
Kidney Function in Pregnancy

• Kidneys play an important role in adapting to normal pregnancy
  – GFR increases by 50%
  – Size increases
  – Increased production of kidney-derived hormones that control red blood cell counts and vitamin D levels
Risk of CKD Progression in Pregnancy

- Risk of "shift" in CKD stage or progression to ESRD
  - 504 pregnancies from two large Italian centers

<table>
<thead>
<tr>
<th></th>
<th>Stage 1 CKD</th>
<th>Stage 2 CKD</th>
<th>Stage 3 CKD</th>
<th>Stage 4-5 CKD</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>28/370</td>
<td>1/87</td>
<td>2/37</td>
<td>2/10</td>
</tr>
<tr>
<td>%</td>
<td>8%</td>
<td>13%</td>
<td>16%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Limitations of Studies

- Small, usually from single center
- Ethnic minorities under-represented
- Planned versus unplanned pregnancy
- All causes of CKD lumped together
- Other important factors such as levels of protein in the urine and high blood pressure not considered
“Three Strikes” Rule

- Elevated serum creatinine (>1.4)
- Proteinuria (cut-off depends on cause)
- Hypertension (>140/90)

-Michelle Hladunewich, MD – Toronto
Will CKD impact my pregnancy?
Negative Pregnancy Outcomes

- Women with CKD have worse maternal and neonatal outcomes than women without CKD
  - 2x increased risk for cesarean section delivery
  - 5x increased risk for preterm delivery or small for gestational age infant
  - 6-10x increased risk for preeclampsia
Preeclampsia

- Disorder unique to pregnancy – less than 5% of healthy women, greater than 20% in women with CKD
- Development of new-onset or worsening high blood pressure and new onset or worsening proteinuria after 20 weeks of pregnancy
- Very hard to distinguish from worsening CKD in pregnancy
- Only treatment is delivery of baby
  - Prematurity
- Low dose aspirin started early in pregnancy may reduce risk of preeclampsia
“Three Strikes” Rule

- Elevated serum creatinine (>1.4)
- Proteinuria (cut-off depends on cause)
- Hypertension (>140/90)

-Michelle Hladunewich, MD – Toronto
Special Considerations
Diabetic Kidney Disease

• Women with diabetes at increased risk for complications in pregnancy even without kidney involvement
• Good control of blood sugars before getting pregnant is essential
  – Elevated HbA1c at the time of pregnancy is associated with higher rates of fetal malformations
• Lisinopril (and other RAAS-blocking medications) must be stopped before or at first diagnosis of pregnancy
Lupus Nephritis

- Pregnancy outcomes improved when kidney disease is in remission prior to pregnancy
  - Recommend 6 months in remission from active kidney disease before getting pregnant
- Mycophenolate mofetil (MMF/Cellcept) teratogenic
  - Should be substituted with alternative medicine before getting pregnant
Kidney Transplant Recipients

- Fertility rapidly restored after transplantation
- Safe to proceed with pregnancy if:
  - > 1 year since transplant
  - Stable kidney transplant function (Cr < 1.5)
  - No episodes of rejection in the past year
  - No recent infections that could harm fetus (CMV)
  - Pregnancy-safe medicine regimen
What to expect…

• Pre-pregnancy
  – Meet with nephrologist to discuss timing of pregnancy, disease-specific risk of complications
  – Contraception advice if delaying pregnancy recommended
  – Fertility assessment if necessary
  – Optimize blood pressure control
  – Change to non-teratogenic medications
What to expect...

• During Pregnancy
  – Target blood pressure less than 140/90
  – Start aspirin
  – Repeated assessment of kidney function and protein in the urine
  – Frequent monitoring of the fetus – weekly or more frequently in second half of pregnancy
What to expect...

• Delivery
  – Delivery early if any medical issues for mother or baby
    • No pre-specified delivery date, although many OBGYNs may recommend delivery around 38 weeks
  – Vaginal delivery preferred
  – Steroids may be needed if
    • Delivery before 34 weeks to promote baby’s lung maturity
    • Steroid use for mother during pregnancy to prevent adrenal crisis
What to expect...

• Postpartum
  – Breast feeding encouraged under most circumstances
  – Adjustment of blood pressure medicines
    • Can resume RAAS blockade (enalapril, captopril)
  – Any pregnancy-associated increases in creatinine or urine protein can take 6 weeks to resolve
Talk to your Nephrologist

• Planning pregnancy is a marathon not a sprint
• Pre-conception management important
  – Many disease require alterations to medications before conception
  – Nephrologist can help identify the best “window” in CKD course
    • Disease activity, CKD trajectory, maternal age
  – May recommend consultation with high risk OBGYN prior to pregnancy
Questions?