Management of the kidney patient during Pregnancy

Jeffrey J Kaufhold, MD FACP
2014
Summary

• Fertility in renal disease
• Complications related to pre-existing renal disease, including Dialysis and transplant.
• Pathophysiology (brief, see “the kidney in pregnancy “ lecture for more detail
• Hypertension in pregnancy
• Diabetes and other renal disease cases
Summary

- Fertility in renal diseases
  - Renal disease
  - Transplant
  - ESRD on dialysis

- Pregnancy in renal diseases
  - Pre-existing renal disease
  - Hypertension
  - Transplant
  - ESRD on dialysis
Impact of pregnancy on renal disease

- Hemodynamic changes– Hyperfiltration
  - Reduced uric acid, hypercalciuria

- Increase in proteinuria

- Pregnancy related illness – Pre-eclampsia

- Possibility of permanent loss of renal function
Impact of renal disease on Pregnancy

- Increased risk of pre-eclampsia
- Increased incidence of prematurity, intrauterine growth retardation
- Increased risk of fetal loss.
Renal Pathophysiology in Pregnancy

- Hypertension
- Proteinuria
- Pre-eclampsia
- HELLP syndrome
- Pre-existing renal disease
- Pre-existing Hypertension
Pathophysiology

- Hypertension
- Proteinuria
- Return of Responsiveness to Angiotensin
Pathophysiology

- **Pre-eclampsia**
  - Severe HTN with risk for seizures
  - Vacuole formation in endothelial cells
  - Circulating Inhibitors of NOS

- **HELLP syndrome**
  - Hepatic dysfunction due to underperfusion
  - Low platelets due to fibrin deposition and scything of cells in capillaries
  - Increased Endothelin
Normal Glomerulus
Ecclampsia
Pre-existing disease in pregnancy

- Pre-existing renal disease
  - General rule is
    - 1/3 worsen
    - 1/3 stable
    - 1/3 improve

- Pre-existing Hypertension
  - Tends to improve
  - Which drugs to use?
Hypertension treatment in pregnancy

- Hypertension: Which drugs?
  - First Line: Aldomet, Labetolol
  - Third Line: Atenolol, Inderal, clonidine, diltiazem, verapamil, HCTZ

- Contraindicated: ACE inhibitors, ARB’s, Tekturna
- Try to avoid use: Diuretics
Fetal consequences of maternal hypertension

- 3-6 fold increase in stillbirths
- 5-15 fold increase in IUGR
- Increased Prematurity
- Increase in Long term developmental and neurologic problems
Classification of Hypertensive disorders in pregnancy

- Transient hypertension
- Chronic Hypertension
- Chronic hypertension with superimposed preeclampsia
- Pre-eclampsia
- Eclampsia
Clinical features of chronic HTN in Pregnancy

- Women tend to be older, multiparous
- HTN is present before 20 weeks, or known to be present in prior pregnancy
- BP may improve or normalize in mid pregnancy
- Risk of superimposed pre-eclampsia is 15-30%
Antihypertensive therapy considerations

- Lower the BP for Maternal safety
  - Lowering BP does not prevent or cure preeclampsia nor benefits the fetus, but may allow delivery to be postponed safely.

- Maintain ureteroplacental blood flow

- Timely delivery

- Seizure prophylaxis with Mag Sulfate.
Antihypertensive therapy considerations

- If delivery is imminent:
  - Hydralazine IV
  - Labetolol IV
  - Calcium Channel blockers
  - Diazoximide IV

- If delivery must be postponed
  - Aldomet
  - Labetolol
  - CCB’s, Alpha Blockers
  - Hydralazine
  - Clonidine
Pregnancy in patients with Diabetic nephropathy

- Increased proteinuria 70 %
- Decreased GFR 40 %
- Increased BP 70 %
- Pre-eclampsia 35 %
- Fetal development problems 20 %
- Fetal Demise 8 %
PCKD in Pregnancy

- Increased risk of UTI
- Maternal HTN associated with poor outcome
- Associated with increased size and number of liver cysts due to estrogen stimulation
- May be increased risk of subarachnoid hemorrhage in women with intracranial aneurysm
Pregnancy and SLE

- Poor outcome associated with:
  - Active disease at time of conception
  - First appearance of SLE during pregnancy
  - HTN, Azotemia in first trimester
  - High titer of APL or lupus anticoagulant
Pregnancy and Antiphospholipid antibody syndrome (APL)

- Increased risk of fetal loss
- Aterial and venous thrombosis
- Renal vasculitis
- Thrombotic microangiopathy
- Pre-eclampsia
- Treatment: heparin, Lovenox, Aspirin
Differentiate lupus flare up vs Pre-eclampsia

- Lupus will have
  - RBC casts,
  - low complement,
  - Leukopenia

- Pre-eclampsia may have
  - Elevated LFT’s
Multiple Pregnancies in CKD

- Background risk for multiple pregnancies
  - 4-5 fold risk for complications
  - Dichorionic 65-70 %, monochorionic 30-35%
- Incidence of multiple pregnancy in CKD pts 6%
  - Higher than the comparison population
- Pts with HTN or Collagen Vascular disease have higher risk of complications, as always
- Risks for fetal loss, prematurity, Need for NICU stay were about double the risk for pts with normal renal function.
Dialysis and Pregnancy

- Successful term delivery 20-30%
- High incidence of Prematurity
- Outcome related to maternal residual renal function

Management issues:
- Increase clearance/ Daily dialysis/consider CAPD?
- ESA therapy
- Control BP
- Lower heparin dose
Renal Transplant and pregnancy

- Well functioning transplant restores fertility in a percentage but not all women
- Women are advised to wait 2 yrs after transplant before considering pregnancy
- Successful term delivery depends on BP and baseline renal function (best under 1.5 - 2.0)
- Controversial if pregnancy accelerates graft loss.
Renal Transplant and pregnancy

- Immunosuppression issues:
  - Cellcept is contra-indicated in pregnancy
    - Switch to Imuran
  - Calcineurin inhibitors are acceptable, but there is increased risk of fetal loss
  - Prednisone does not cross placental barrier, try to use lowest dose (5-10 mg /day)
    - Does carry some increased risk of cleft palate when used in first trimester.
Guidelines for Pregnancy after transplant

- Wait at least 1 year
- Creatinine should be less than 2.0
  - Better if creat < 1.3
- Normal BP, no Proteinuria
- No recent rejection
- No dilation of pelvicalyceal structures
- Medication dose targets for better outcome:
  - Prednisone dose < 15 mg /day
  - Imuran < 2 mg/kg/day
  - Cyclosporine < 4 mg/kg/day
Recommendations in Transplant pts Prior to conception

- Stop Cellcept 6 weeks prior
- Stop Rapamune and Everolimus
- Stop Statins and ACE/ARB
- 24 hour for protein and creat clearance
- PCR for CMV and toxo
- Urine culture
- Consult with High Risk Obstetrician
Recommendations in Transplant pts During Pregnancy

- Low dose aspirin
- Monitor BP twice daily
- Kidney US during first trimester
- Monitor renal function and CNI levels weekly
- Urine culture and Prot/Creat ratio monthly
- 24 hour urine, toxo and CMV every trimester
Recommendations in Transplant pts After delivery

- C-section only for obstetric emergencies
- Continue twice daily BP monitoring for 6 weeks postpartum
- 24 hour urine protein and creat clearance at 1 and 6 months.

Pregnancy after Kidney Donation

- Likelihood of full term delivery reduced from 84% in general population to 74% post-donation.
- Higher likelihood of fetal loss 19% compared to 11%.
- Higher risk of:
  - Gestational diabetes 2.7% vs 0.7%
  - Gestational HTN 5.7% vs 0.6%
  - Proteinuria 4.3% vs 1.1%
  - Preeclampsia 5.5% vs 0.8%

Case 1

- 26 yo female with Living related Renal transplant 10 years ago, on Cellcept and Neoral. Having irregular menses (is this typical or atypical?)

- Complains of nausea and cramps during some but not all menses. Management would include:
  - Tylenol?
  - NSAID’s?
  - Hormone replacement therapy?
  - Skelaxin (metaxalone) ?
  - Midol?
Case 2

- 26 yo female with Living related Renal transplant 10 years ago, on Cellcept and Neoral. On Altace for HTN with good BP control. Comes in for routine appt with questions regarding pregnancy.

- Before she gets pregnant, (or as soon as possible after it is known) which med changes do you make?
Case 2

- 26 yo female with Living related Renal transplant 10 years ago, on Cellcept and Neoral. On Altace for HTN with good BP control. Comes in for routine appt with questions regarding pregnancy.

- Before she gets pregnant, (or as soon as possible after it is known) which med changes do you make?

  - Convert Cellcept to Imuran
  - Convert Altace to Labetolol, or aldomet, or hydralazine.
Case 3

- 28 yo female with Steroid dependent Minimal Change Disease is well controlled on Cellcept and able to wean off Prednisone. She stops Cellcept after a year in remission in order to get pregnant.

- 8 weeks into her pregnancy she notes explosive onset of edema and frothy urine. 24 hour urine protein is 8.8 gm/day. Options for management:
  - A. Resume cellcept since it worked before
  - B. Start prednisone 60 mg / day (1 mg/Kg) for 3 months
  - C. Start Prednisone 30 mg every other day for 3 weeks, and cyclosporine 5 mg/kg / day in divided dose.
  - D. Start prednisone 30 mg every other day for 3 weeks then taper to 10 mg daily until delivery.
  - E. No treatment until after delivery.
Case 3

- Comments:
  - Either C or D is reasonable.
  - Increased risk of fetal loss, DVT and infection if nephrotic syndrome left untreated.
  - Remember to use stress dose steroids at time of delivery if mother received any steroids at any point during pregnancy.
References

- Medical Care of the Pregnant Patient
  - RV Lee, K Rosene-Montella et al. Published by the American College of Physicians (acponline.org), 2000

- Kidney Disease and Pregnancy
  - Dr Phyllis August

- Pregnancy Outcomes after kidney Donation

