Postpartum Complications
Objectives

- Understand the PP physiologic changes that occur in various body systems
- Recognize and manage common and life-threatening postpartum complications
  - PP hemorrhage (covered in a separate lecture)
  - PP endometritis
  - PP cardiomyopathy
  - PP thyroiditis
  - PP depression
- Know the evaluation, diagnosis and management of PP infection
Uterine Involution

• Fundus slightly below umbilicus after delivery
• In pelvis at 2wk PP
• Normal size at 6wk PP
• Cell size decrease rather than cell number
• “After pains”
Hemostasis

• compression of the vasculature by uterine muscles

• arteries
  – hyalinization and obliterative fibrinoid endarteritis
  – remain for extended periods as stigmata of the placental site

• veins
  – thrombosis, hyalinization, and endophlebitis
  – extruded with the slough of the necrotic placental site
Uterine Subinvolution

• Arrest or retardation of involution
• Pt may have prolong lochia, irregular, or hemorrhage
• Uterus is boggy & enlarged
• Causes: Retained POC, pelvic infection
• Treatment: methergine, antibiotics
Placenta

• **Endometrium**
  – shearing at the decidual layer
  – decidual necrosis begins
  – regeneration of endometrial glands
  – regeneration of endometrial stroma
  – by PPD #16, the endometrium is fully restored

• **Myometrium**
  – autolysis of intracellular proteins
  – decrease in cell SIZE not number
Lochia

• Blood - several hours
• Reddish-brown until PPD #3 or 4
• Lochia Serosa
  – mucopurulent
  – may be somewhat malodorous
  – median duration - 22 days
  – 15% - have lochia serosa at 6 weeks PP
• Lochia Alba
Lochia, cont.

- Duration not affected by breast feeding or OCPs
- Often increases between PPD7 and 14
- Sloughing of placental eschar
- If not self-limited ➔ evaluate for retained placenta
Cervix

- Epithelium – increased thickness
- Glands – Hypertrophy and Hyperplasia
  - Persists for approximately 1 week PP
  - Should be normal by 6 weeks PP
- Stroma – Increased vascularity and decidual reaction
- Regression begins within 4 days PP
- Os assumes multiparous shape
Vaginal Mucosa

• Returns to normal over 1\textsuperscript{st} several days
• May reflect hypoestrogenic state if pt is breastfeeding
Ovarian Function

- **Lactating Women**
  - 190 days PP
  - Dependent on frequency and duration of feedings

- **Non-Lactating Women**
  - 4-5 wks PP
  - Mean: 10 weeks
  - 50% by 90 days PP
  - 70% by 12 weeks PP

- **Hormone Regulated**
  - Increased Prolactin – normal by 3rd week in non-lactating; 6th if lactating
  - Estrogen – decreased for both immediately
    - Remains decreased if lactating
    - Begins to increase at 2 weeks PP if not
  - FSH – similar in both
    - Therefore, the ovary does not respond to FSH stimulation in the presence of increased prolactin
Cardiovascular System

- Blood Volume – up by 35% during pregnancy
- Plasma Volume
  - Increased by 1200 ml (50%) in pregnancy
  - Decreases by 1000 ml due to blood loss from delivery
- Extracellular Fluid
  - Normal by 8 wks PP as it shifts intravascular
- Pulse, Stroke Volume, Cardiac Output
  - All increased in pregnancy and remain immediately PP
  - Normalizes by 8-10 wks PP
  - Contributes to the decompensation that can be seen in pts with CV disease
- Blood Pressure
  - Transient increase in first 4 days PP
  - Normalizes at 1 week PP
Hematopoietic System

• Leukocytosis of Labor
  – Presists into the early PP period

• Platelet Count
  – Increased in all pts at 2 weeks PP, normalizes by 6 wks

• Coagulation
  – Increases PPD1 to 4, normalizes by 1 week PP
  – Virchow’s Triad (hypercoagability, venous stasis, endothelial damage)
Thyroid

• Volume increased by 30%
• Regresses over 12 weeks
• Hormones
  – TBG – increased d/t increased estrogen
  – Bound T3, T4 increased
  – Free T4 unchanged
  – T3 uptake decreased
  – Normalizes by 6 weeks PP
  – PP pts are at risk for autoimmune thyroiditis ➔ hypothyroidism
Renal System

• Physiology
  – Entire system dilated
  – Compression of engorged pelvic vessels and enlarged uterus
  – R>L
  – Normal by 8 weeks PP

• Renal Function
  – GFR increased by 50%
  – Renal plasma blood flow increased by 75%
  – CrCl increased by 40%
  – Serum Cr decreased
  – Serum uric acid decreased
  – Protein excretion does not change
Postpartum Care

• Hospital Stay
  – Vaginal $\rightarrow$ 1-2 days (2 if GBS +)
  – C-Section $\rightarrow$ 2-3 days
  – M-I bonding very important
  – Pain Control
Pain Control

• Vaginal/Perineal
• Breast
• Uterine Contractions
• Medications
  – Narcotic-analgesic combinations
    • Percocet 5 → i-ii tabs PO q 4-6 hr prn pain
    • Lortab 5 → i-ii tabs PO q 4-6 hr prn pain
  – Anti-inflammatory
    • Motrin 800 mg with food PO q 8 hours prn
  – YOU SHOULD BE WRITING SCRIPTS FOR THE RESIDENTS!!
Perineal Care

- Pain meds
- Ice Packs
- Hygiene
- Pelvic Rest
- Hematomas
Breast Care

• Lactating mothers (70%)
  – Lactation consultants
  – Encourage starting as early as possible
  – Colostrum
    • High in minerals (not VK)
    • High in proteins (esp IgA – enteric bugs)
    • Low in fat and sugar
    • Persists 4-5 days PP→mature milk
    • Nipple care

• Non-Lactating mothers
  – DO NOT stimulate lactation
    • Ice packs, breast binders, aboid heat and tactile stimulation
Uterus

• Firm, palpable, at or below umbilicus

• Boggy → sign of PPH
  – Assess lochia
  – Empty bladder
  – May need uterotonic
    • Pitocin
    • Methergine (not if htn)
    • Hemabate (not if asthma)

  – Surgical Mgt
Bowel & Bladder Function

• Stool Softeners
• Watch for urinary retention
  – Ureteral Edema – resolves over time
  – Anesthesia – resolves over time
  – Ureteral injury (surgery) – need IVP
Immunizations

• Rubella – MMR if NI
• Rh Status – If Rh- and baby Rh+ → Rhogam workup
  – Rhogam does in 300mg IM
• TDap
Contraception

- **PPTL**
- **OCPs**
  - Combo – begin at 2wk PP
  - Progesterone only – if breastfeeding (micronor)
- **Depo-Provera** – 150mg IM
Board Review

• Which of the following statements about postpartum depression is true?
  – A. Postpartum depression usually occurs 9 to 12 months after delivery.
  – B. Social support has little impact on the development of postpartum depression.
  – C. Those with obstetric complications are at increased risk.
  – D. Those affected are at increased risk for postpartum depression with subsequent pregnancies.
  – E. Patients who have postpartum depression have no higher risk of developing depression in later years when compared to the general population.
Postpartum Depression

• Most common complication
  – Occurs in 13% (1 in 8) of women after pregnancy
  – Recurs in 1 in 4 with prior depression
  – Begins within 4 weeks after delivery

• Multifactorial etiology
  – Rapid decline in hormones, genetic susceptibility, life stressors

• Risk Factors
  – Prior h/o depression, family h/o mood disorders, stressful life events
Postpartum Depression

• Pattern of sx are similar to other episodes of depression
  – Depressed mood, anxiety, loss of appetite, sleep disturbance, fatigue, guilt, decreased concentration
  – Must be present most of the day nearly every day for 2 wks
    • Not a separate dx from depression in DSM-IV; “postpartum onset specifier” is used for mood d/o within 4 wks pp

• Screening
  – Edinburgh Postnatal Depression Scale
  – + screen with score >/= 10
  – r/o anemia and thyroid disease
PP Depression

• Differential Diagnosis
  – Baby Blues – common, transient mood disturbance
    • Sadness, weeping, irritability, anxiety, and confusion
    • Occurs in 40 - 80% of postpartum women
    • Sx peak 4\textsuperscript{th} – 5\textsuperscript{th} day pp and resolve by 10 – 14 days
  – Postpartum psychosis
    • Psychiatric emergency due to risk of infanticide or suicide
    • Bizarre behavior, disorganization of thought, hallucinations, delusions
    • usually occurs in first 2 weeks pp
PP Depression

• Treatment
  – SSRIs are first-line drugs
    • Initiate at half the usual starting dose
    • Treat for at least 6 – 12 months after full remission to prevent relapse
    • Sertraline or paroxetine for breast-feeding mothers
  – May also respond to psychotherapy
Postpartum Infection

• $T > 100.4$ on any 2 of the 10 days PP excluding the first 24 hours

• 7 Ws of PP Infection
  – Womb
  – Wind
  – Water
  – Wound
  – Walking
  – Weaning
  – Wonder drugs
Postpartum Endometritis

• Infection of the decidua (pregnancy endometrium)
• Incidence
  – Most Common PP Infection
  – <3% after vaginal delivery
  – 10-50% after cesarean delivery
    • 5-15% after scheduled elective cesareans
• Risk Factors
  – C/S (#1), Prolonged labor, prolonged ROM, multiple vaginal exams, internal monitors, maternal DM, meconium, manual removal of placenta, low socioeconomic status
PP Endometritis

• Polymicrobial, ascending infection
  – Mixture of aerobes and anaerobes from genital tract
  – BV and colonization with GBS increase likelihood of infection

• Clinical manifestations (occur within 5 days pp)
  – Fever – most common sign
  – Hallmark – exquisitely tender uterus
  – Foul lochia
  – Leukocytosis
  – Bacteremia – in 10-20%, usually a single organism
PP Endometritis

• Workup
  – CBC
  – Blood cultures
  – UAM, Urine culture/sensitivity
  – DNA probe for GC/chlamydia
  – Imaging studies if no response to adequate abx in 48-72h
    • CT scan abd/pelvis
    • US abd/pelvis
    • CXR
PP Endometritis

• Treatment
  – Broad spectrum IV abx
    • Clindamycin 900mg IV q8h and
    • Gentamicin 1.5mg/kg IV q8h
  – Treat until afebrile for 24-48h and clinically improved; oral therapy not necessary
  – Add ampicillin 2g IV q4h to regimen when not improving to cover resistant enterococci
  – Other Regimens: Unsasyn, Zosyn, cephalosporin

• Prevention
  – Abx prophylaxis for women undergoing C-section
    • Cefazolin 1-2g IV as single dose
Pelvic Abscess

• persistent fever despite appropriate abx treatment
• protracted malaise
• delayed return of GI function
• diagnosed by CT, sono or MRI
• treatment
  – drainage
    • percutaneous
    • colpotomy
    • laparotomy
  – abx
Respiratory Complications

• typically present at PPD #1
  – atelectasis
    • incomplete expansion of the lung
    • especially in dependent portions (i.e. bases)
    • more common after GETA
    • not a true infection
    • treatment
      – incentive spirometry, respiratory therapy
      – EARLY AMBULATION!!!
  – pneumonia
    • relatively rare
    • treatment - abx
Breast Infections

• mastitis
  – occurs in breastfeeding mothers
  – infection by infant’s oropharyngeal flora
  – treatment - abx
    • PCN or related drug
    • erythromycin if PCN allergic
  – no need to stop breastfeeding on affected side

• abscess
  – surgical debridement and abx
Urinary Tract Infections

• typically present on PPD #2
• catheterization increases risk
• cystitis
  – dysuria
  – frequency
  – hesitancy
• pyelonephritis
  – above with CVA tenderness
• treatment - broad spectrum abx
Wound Infections

• typically present at PPD #4-5
  – erythema
  – induration
  – tenderness
  – ensure that fascia is intact!!
  – purulent and/or malodorous discharge
  – treatment
    • debridement
    • abx
    • wound culture
    • wound care
      – wet-to-dry dressing Δ’s
      – Heal by 2° intent

• Dehiscence
  – Fascia NOT intact, serosanguinous DC
  – Treatment – surgical exploration, debridement and reapproximation of fascia
Episiotomy Infection

• RARE
• red, swollen, tender episiotomy site
• treatment
  – suture removal
  – debridement
  – antibiotics
  – Sitz baths
  – delayed closure of episiotomy site
Nectrotizing Fascitis

- RARE
- may be perineal or abdominal
- infection involving muscle and fascia
- organisms
  - similar to other pelvic infections
  - anaerobes predominate
  - Clostridium perfringens
- frequently fatal
  - overwhelming sepsis
  - multi-organ failure
- treatment
  - IMMEDIATE surgical debridement
  - abx - BIG guns (vancomycin, methicillin)
  - ICU admission
Septic Pelvic Thrombophlebitis

- diagnosis of exclusion
- etiology - unclear
  - venous stasis
  - superinfection
- fever despite abx treatment with negative imaging studies
- treatment
  - heparin
Peripartum Cardiomyopathy

• Rare cause of heart failure in late pregnancy or early puerperium

• Definition
  – Development of heart failure in last month of pregnancy or within 5 mos of delivery
  – No identifiable cause for the failure
  – No history of heart disease prior to the last month of pregnancy
  – Left ventricular systolic dysfunction
    • LVEF <45%
Peripartum Cardiomyopathy

- Incidence – 1:3000 to 1:4000
- Unknown etiology
  - Potential contributors:
    - Hormones
    - Inflammatory cytokines (TNF-alpha and IL-6)
    - Myocarditis
    - Abnormal immune response
    - Genetic and/or environmental factors
PPCM – Risk Factors

- Age > 30
- Multiparity
- Multiple fetuses
- Women of African descent
- History of PIH
- Maternal cocaine abuse
- Oral tocolytics with beta adrenergic agonists > 4 weeks
PPCM - Diagnosis

• ECG
• CXR
• Echocardiogram
• Viral and bacterial cultures
• Cardiology referral
  – Cardiac catheterization
  – Endomyocardial biopsy
PPCM - Treatment

• Similar to treating other types of HF
• Digoxin
• Diuretics
• Vasodilator – hydralazine
• Beta blockers – beta-1 selective
• Class III antiarrhythmics
• Anticoagulation
  – heparin if pre-delivery (due to short half-life & reversibility), but may use Coumadin during 3rd trimester & postpartum, w/ INR goal of 2.0 to 2.5
PPCM - Treatment

- IVIG showed increase in LVEF in small study
- Heart transplantation
  - If conventional therapy not successful
  - Should avoid future pregnancy
Postpartum Thyroiditis

- A variant form of Hashimoto’s thyroiditis occurring within 1 year after parturition
- Incidence – 3-16% of postpartum women
  - Up to 25% in women with Type 1 DM
- Most have high serum levels of anti-peroxidase Ab
- Thyroid inflammation damages follicles → proteolysis of thyroglobulin → release of T3 + T4 → TSH suppression
Postpartum Thyroiditis

• Clinical manifestations
  – 20-30%
    • Hyperthyroidism 2-4 mos pp, lasting 2-8 wks, followed by hypothyroidism, lasting 2-8 wks, then recovery
  – 20-40%
    • Hyperthyroidism only
  – 40-50%
    • Hypothyroidism only, beginning 2-6 mos pp
Postpartum Thyroiditis

• Symptoms and signs, when present, are mild
  – Hyperthyroidism
    • Anxiety, weakness, irritability, palpitations, tachycardia, tremor
  – Hypothyroidism
    • Lack of energy, sluggishness, dry skin

• Diagnosis
  – Small, diffuse, nontender goiter or normal exam
PP Thyroiditis

- Diagnosis contd.
  - No ophthalmopathy
  - High or high normal T3 + T4, low TSH, low radiiodine uptake (hyper phase)
    - Low or low normal T4, high TSH (hypo phase)
- 65-85% have high antithyroid Abs
PP Thyroiditis

• Treatment
  – Most need no treatment unless have bothersome sx
    • Hyper: atenolol or propanolol
      – Avoid in nursing women
    • Hypo: levothyroxine 50-100 mcg qd for 8-12 wks, discontinue, re-eval in 4-6 wks
    • Educate patient on sx, increased risk of developing hypothyroidism or goiter, likely recurrence with subsequent pregnancies
Sample Soap Note

- (S) Reports good pain control; ambulating/voiding without difficulty; BF- o.k.; desires D/C today. Decreased lochia.
- (O) 98.7 74 110/70 18 (if postop, include UOP, H/H)
- (A)
  - Gen - appears well
  - CV - RRR, systolic flow murmur
  - Resp - CTAB; no wheezes
  - Abd – FF/NT, umbilicus (check incision)
  - Gen - lochia - scant
  - Ext - NTB
- (P) Routine PP care
  - Desires OCP’s - Micronor script on chart
  - D/C today with Percocet, Motrin for pain
  - Discussed D/C instructions
Bottom Line

• Try to have your patients rounded on by 6 a.m.
• PAY ATTENTION to your patients
• Write comprehensive but not overly detailed SOAP notes (be thorough but succinct!!)
• Ask questions and always be ready to learn
• Be a team player
• If you have ANY questions, ask your resident