Postpartum Complications

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Goals and Objectives

- Recognize normal postpartum sequelae
- Identify the systems involved in postpartum complications
- Recognize the treatment of epidural complications
- Identify the causes and treatments of postpartum fever
- Recognize postpartum cardiomyopathy and its treatment
- Review common neuropathies associated with PP
- Identify preeclampsia and eclampsia and the treatment
- Identify postpartum hemorrhage and its treatments
Case Presentation

- **HPI:** 28 yo G2P1011 F with hx of gestational DM who is 6 mo PP presents with CP x 1 day. L sided pleuritic chest pain, 6/10. on depo shot. Took aspirin at home which did not help. No hx of clots or family hx of clots. No LE swelling, prolonged travel, n/v/d, abdom pain, no vag dc.

- **VS:** 146/98 RR 20 HR 78 99%

- **PE:** unremarkable per Dr. Clark

- **ddx:** ACS, MI, pneumothorax, pleurisy, pericarditis, myocarditis, asthma, pneumonia, lung abscess, aortic dissection, PE, trauma, rib fx, pancreatitis, GERD, costochondritis
Postpartum period

Aka puerperium – begins with the delivery of the baby and the placenta and ends 6-8 wks later

All organ systems do not return to baseline within this period
The incidence of ICU admission for pregnant and postpartum women ranges from 0.7 to 13.5 per 1000 deliveries.

When critical care is required, maternal mortality is high,

- ~ from 3.4 to 14 percent
- In the U.S., the leading cause of maternal mortality is death due to cardiovascular disease and cardiomyopathy
  - Possibly secondary to rising maternal age and high incidence of obesity, DM, and HTN

Causes of preventable maternal death include:

- postpartum hemorrhage, preeclampsia, medication errors, and some infections
Normal Postpartum Changes

- **Uterine involution**
  - Myometrial retraction and large vessel thrombosis
  - Fundus non-tender, firm, and more globular
  - major mechanism to prevent hemorrhage
  - uterine inversion is an OB emergency → shock
  - Uterus palpated between symphysis pubis and umbilicus within one wk and not palpable by 2 wks

- **Lochia**
  - Lochia rubra (red, red brown) lasts 3-4 days
  - Lochia serosa (pinkish brown) lasts 2-3 wks
  - Up to 15% of women pass lochia for 6-8 wks postpartum

- **Abdominal wall muscle tone** increases over several wks
  - Diastasis recti may persist resulting in low back pain, abdominal discomfort, and cosmetic issues
Normal Postpartum Changes

- **Afterpains**
  - Secondary to hypertonic uterine contractions
  - NSAIDs (600 mg q6 PRN) are more effective than opioids
  - Resumes spontaneously by end of 1st wk

- **Perineal pain**
  - NSAIDs or tylenol is more effective
  - Local cooling tx is used but limited evidence to support its efficacy

- **Breast engorgement** (1-7 days)
  - Tylenol and ibuprofen are best
  - Avoid toradol (black box warning prostaglandin inhibiting)
  - Avoid codeine (or counsel for symptoms of infant narcotic OD)
  - Tight brassiere, ice packs, and avoidance of stimulation to supress lactation*
Postpartum Complications

- **ID**
  - Postpartum fever/infection

- **Heme**
  - Postpartum excessive bleed or hemorrhage
  - TTP-HUS

- **GU**
  - Uterine inversion
  - Episiotomy breakdown
  - Vulvar edema

- **Renal**
  - Urinary retention

- **Neuro**
  - Eclampsia
  - Postpartum neuropathy

- **Cardio**
  - Peripartum cardiomyopathy
  - Preeclampsia

- **Pulm**
  - Pulmonary embolism
  - Aspiration pneumonia
  - Amniotic fluid embolism
Epidural Complications

- **Postdural puncture headache**
  - 2/2 leakage of CSF through dural rent, traction on cranial structures, and cerebral vasodilation
  - Key: positional headache
  - Tx: caffeine, IVF, and epidural blood patch

- **Epidural abscess**
  - 1/145,000

- **Epidural hematoma**
  - 1/168,000

- **Neurologic injury**
  - Persistent 1/240,000
  - Transient 1/6,700
Postpartum Fever

- **Endometritis**
  - Fever, uterine tenderness, foul lochia, and leukocytosis 5 days post delivery
  - Initiate clindamycin and tobra or gentamicin; alternatively doxycycline
  - Mild infections – oral; mod infections – parenteral therapy

- **UTI**
  - Occurs in ~ 2.8% of C/S and 1.5% of vag delivery
  - Tx: bactrim, cipro, nitrofurantoin, or levofloxacin
  - If pyelonephritis, treat with amp/gent (no effects on breastfeeding infants)

- **Wound infection**
  - 2.5-16% of C/S patients 4-7 days post op
  - Drainage, irrigation, or debridement may be necessary
  - Tx: broad spectrum antibiotics
Postpartum Fever

- **Mastitis**
  - Localized, painful inflammation
  - If unresolved could lead to abscess
  - **Abx:** keflex, dicloxacillin, or clindamycin when penicillin allergy
  - **Tx:** ice packs, analgesics, and continued breastfeeding

- **Aspiration pneumonia**
  - Specifically after C/S, especially if unplanned

- **C. Diff diarrhea**
  - Esp with women who received abx intrapartum
  - **Tx:** flagyl as usual
Postpartum Fever

Septic pelvic thrombophlebitis

- **Pathogenesis**
  - Rare; associated with intrapartum trauma or infxn (endomyometritis or bacteremia), venous stasis, and hypercoagulability

- **Presentation**
  - Ovarian vein thrombophlebitis
    - Fever and abd pain 1 wk post delivery/surgery
    - Visualized radiographically 20% of the time
  - Deep septic pelvic thrombophlebitis
    - Unlocalized fever that persists after abx a few days PP

- **Diagnosis**
  - CT abd/pelvis and CBC/Bcx

- **Tx**
  - Broad spectrum abx, ie amp/gent/flagyl
  - Start heparin; 60 U/kg initial bolus and 12U/kg/h
Vaginal Complications

Episiotomy Breakdown

- Associated with longer 2nd stage of labor, operative vag delivery, 3rd/4th lacs, and meconium stained amniotic fluid
- Localized to skin or subq
- On PE, swelling and erythema with purulent exudate
- Tx: I&D and debridement
- No abx necessary unless cellulitis accompanied

Vulvar Edema

- Not uncommon immediately PP, relieved with ice packs
- Rarely, can have severe unilateral or bilateral edema
- Edema, induration, perineal pain, and WBC >20 = fatal
- Early empiric tx of broad spectrum abx to cover group A strep; nec fasciitis can develop
- Rarely can be manifestation of hereditary angioedema
Chest Pain

- Pulmonary embolism
- Acute MI
- GERD
- Panic disorder
- Post partum depression
Chest Pain

Peripartum Cardiomyopathy

- **Pathogenesis**
  - Rare, potentially lethal; 2/2 inflammatory and autoimmune factors
  - Reduced EF < 45% that occurs from 36wks to 5 mo PP
  - RF: preeclampsia, older age, multiparity, and African descent

- **Presentation**
  - Sx similar to any pt in systolic HF
  - On avg, it took >7 days or a major adverse event to diagnose (ie stroke)

- **Diagnosis**
  - EKG, troponin, BUN/Cr, ambulatory pulse ox, CXR, echo

- **Tx**
  - Hydralazine and nitrates, lasix, carvedilol, amlodipine, digoxin
  - Prophylactic anticoagulation given high rate of thromboembolic complications
Pelvic Pain

Postpartum Neuropathy

- Incidence
  - 1 to 58 per 10,000 deliveries

- Pathogenesis
  - RF: fetal macrosomia, malpresentation, sensory blockage, prolonged second stage of labor
  - Usually mononeuropathies that result from compression, stretch, transection, or vascular injury

- Presentation
  - Sensineuronal loss in lumbosacral trunk, lateral femoral cutaneous n. (Meralgia paresthetica), femoral n., obturator n., common peroneal n. or saphenous n.

- Diagnosis
  - Imaging if necessary

- Tx
  - Excellent prognosis; however, weakness may persist
  - Analgesia and referral
Preeclampsia/eclampsia

- **Definition**
  - **Preeclampsia**: new onset HTN and proteinuria and/or end organ damage
  - **Eclampsia**: preeclampsia + grand mal seizure
  - **HELLP**: hemolysis, elevated LFTs, thrombocytopenia (probably represents a severe form of preeclampsia but controversial)
    - Develops in 10-20% of women with preeclampsia/eclampsia

- **Prevalence**
  - In the U.S., ~3.4%, but 1.5-fold to 2-fold higher in first pregnancies
  - Seizures occur in 2-3% of severely preeclamptic women without anti-seizure prophylaxis
  - In >48 hrs PP, eclampsia risk is 5-17% in severe preeclampsia
Preeclampsia/eclampsia

- **Presentation**
  - **Preeclampsia**
    - HTN >140/90 with proteinuria
    - Headache, LE swelling, or blurry vision
  - **Eclampsia**
    - 1 or >1 seizure in preeclamptic women in the absence of neurologic conditions
    - Self-limited, 60-75s long
    - Headache, visual disturbances, RUQ pain, AMS, SOB, nausea/vomiting, and epigastric pain

- **Diagnosis**
  - No imaging or EEG required for diagnosis
  - Include LFTs and CBC to r/o HELLP
Preeclampsia/eclampsia

- **Tx – ABCDs**
  - Airway patency and prevention of aspiration
  - Supplemental O2 to prevent maternal hypoxia
  - Manage severe HTN and reverse anticoagulation
    - Treat diastolic pressure >105-110 and systolic BP> 160
    - Hydralazine 5 mg IVP and repeat q 20 mins
    - Labetalol 10-20 mg IVP, double dose q 10 mins till 80 mg
    - Goal to decrease BP within 2-6 hrs
  - Disability – prevent recurrence
    - mag sulfate 6g IVP over 15-20 mins or 5 g IM in each buttock + 2g/hr drip
  - Resolution
    - Diuresis >4L/day of UOP = clinical indicator of resolution

- **Complications**
  - 15-20% of deaths from eclampsia 2/2 stroke
  - DIC, ARF, liver rupture, postpartum hemorrhage
Postpartum Hemorrhage

- **Definition**
  - Excessive bleeding that makes the patient symptomatic and/or signs of hypovolemia
  - **Primary PPH** – bleeding within the first 24 hours
  - **Secondary PPH** – 24 hrs to 12 wks post delivery
  - Royal College of OBGYN classes:
    - Minor (500-1000 mL)
    - Major (>1000 mL)

- **Incidence**
  - Varies widely, 1-5% of deliveries
Postpartum Hemorrhage

- **Etiology**
  - Abnormal placenta (accreta, increta, percreta)
  - Uterine atony (80%)
  - Abruption
  - Coagulopathy – 2/2 HELLP, fetal demise, thrombocytopenia, amniotic fluid embolism, DIC, sepsis, severe preeclampsia

- **Treatment**
  - Transfuse RBCs, plts, cryo, and FFP to achieve:
    - Hgb > 7.5
    - Plts > 50,000
    - Fibrinogen > 200 mg/dL
    - PT < 1.5x normal
## Postpartum Hemorrhage

### Management

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<tr>
<th>Post Vaginal</th>
<th>Post C/S</th>
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<tbody>
<tr>
<td>Uterine massage and compression</td>
<td>Address source of bleeding</td>
</tr>
<tr>
<td>Recognize uterine inversion or uterine rupture</td>
<td>Uterine atony</td>
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<tr>
<td>Uterotonic drugs</td>
<td>Hysterotomy incision bleed</td>
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<tr>
<td>- Oxytocin 40 U/1L NS</td>
<td>Uterine artery or utero-ovarian artery ligation</td>
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<tr>
<td>- Misoprostol 400 mcg SL</td>
<td>Uterine suture</td>
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<tr>
<td>- Methergine q2-4h</td>
<td>Hysterectomy</td>
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<td>Uterine tamponade balloon</td>
<td>Hysterectomy if need be</td>
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<tr>
<td>Remove retained products of conception</td>
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<tr>
<td>Repair lacerations</td>
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Case Presentation

- **Labs:**
  - CBC, lytes, trop x1, d-dimer
  - D-dimer ***

- **Imaging:**
  - CXR wnl
  - CT PE: acute PE of distal L interlobar artery with extension into subsegmental branches

- **Treatment:**
  - Lovenox 90 mg SC

- **Dispo:**
  - Admit to GPU for further work-up

- **Follow up:**
  - ***

- **GET CT PE PIC!**