POSTPARTUM FEVER

FLAME LECTURE: 132

BURNS 11.21.18

LEARNING OBJECTIVES

Identify risk factors for postpartum infection

List common postpartum infections

Develop an evaluation and management plan for the patient with postpartum fever

- Prerequisites:
  - NONE
- See also – for closely related topics
  - FLAME 128 – Management of Triple I
  - FLAME 133 – Postpartum Endometritis

DEFINITION & EPIDEMIOLOGY

- **Postpartum Fever** is a temperature >38°C on 2 of the first 10 postpartum days (PPD) excluding first 24hrs after delivery
  - There are several benign and transient causes of temperature elevation intra- and immediately post-partum
  - However a febrile temperature that is sustained or appears after the first 24hrs is concerning for a postpartum infection and should be investigated
  - Since most patients are discharged on PPD 2-3, many postpartum infections become symptomatic following discharge
    - 94% of postpartum infections diagnosed after discharge

DEFINITION & EPIDEMIOLOGY

- Postpartum infections affect 6% of all births
  - 5.5% of Vaginal deliveries – most common culprits mastitis & UTIs
  - 7.4% of C-Section deliveries – most common culprit endometritis
- Prognosis is favorable with prompt identification and treatment
  - However, consequences are severe if infections go untreated:
    - Scarring / Infertility
    - Sepsis / Septic shock
    - Death – per CDC 11.6% of maternal deaths attributed to infection

ETIOLOGY

NON-INFECTIOUS CAUSES OF POST-PARTUM FEVER

- Non-infectious postpartum fever typically resolves spontaneously within 24hrs of delivery
- Common causes include:
  - Epidural anesthesia
  - Misoprostol
  - Physiologic temperature increase during labor
- Because these early temperature increases are transient, postpartum fever morbidity is concerning if temps spike/continue after first 24hrs
  - However, excessively high temperatures (>39°C) before 24hrs postpartum especially following a C-section are concerning for uterine infection

ETIOLOGY

PPD 0 "WIND"	**PPD 1-2** "WATER"	**PPD 2-3** "WOMB"	**PPD 4-5** "WOUND"	**PPD 5-8** "WALKING"	**PPD 7-21** "WEAN"
"*ATELECTASIS*"	UTI / PYELO	ENDOMETRITIS	WOUND SITE	VTE / SEPTIC THROMBOPHLEBITIS	MASTITIS
• Mild/moderate fever •*Controversial*	• High fever • Malaise, CVA tenderness • + urine culture	• Moderate fever • Abnormally tender uterus	• Persistent fever despite antibiotics • Wound signs – erythema, drainage	• Persistent fever despite antibiotics • Constant flank, lower abdominal pain	• Moderate to severely high fever, malaise, myalgias • Unilateral, breast erythema, edema, tenderness

6 W's of Postpartum Fever

- Above is a general guide to helping narrow likely causes by postpartum day, though exceptions to the above guide certainly may arise and clinical suspicion must be maintained for all such causes
- Other Ws to consider are *pneumonia* which may fall under "wind" at varying time points, and *drug fever* under the previous category of "wonder drugs"

ENDOMETRITIS

- *Discussed further in **FLAME 133: Postpartum Endometritis***
- Increased risk in C-section delivery

Clinical findings

Diagnosis is clinical: febrile with tachycardia, uterine or lower abdominal tenderness

Purulent lochia may also occur but is more rare

Pathogens

Typically polymicrobial organisms from lower reproductive tract, anal, and perineal regions that have contaminated uterus during delivery/cesarean

Management

IV Gentamicin + Clindamycin
+ Ampicillin if septic

Continued until afebrile >24hrs, no home Abx needed

WOUND INFECTIONS

- Includes perineal laceration repairs, episiotomy or C-section surgical site infections
  - Vaginal deliveries: 1% of wounds have infections
  - C-section:1-2% of all surgical sites have complications
    - Risk factors BMI, chorioamnionitis, anticoagulant thereapy, blood transfusion

CLINICAL FINDINGS

Pelvic/abdominal exam shows erythematous, swollen or draining of wound site

PATHOGENS

Early C-section infection: group A or B strep (w/ cellulitis)

Later c-section infection/vaginal wounds: *Staph epidermidis, aureus, E. coli*, cervicovaginal flora

MANAGEMENT

Open wound with drainage, irrigation and debridement

Antibiotics not necessary unless cellulitis present/suspected

URINARY TRACT INFECTIONS

- Postpartum bacteriuria common but only ¼ of women with +UA have symptoms.
- Risk factors:
  - C-section
  - Operative delivery
  - Bladder catheterization
  - Epidural anesthesia
  - High maternal BMI
- Management is similar to non-pregnant women just avoiding medications not safe for breast-feeding
  - Bactrim safe for breastfeeding babies >2 months due inc. bilirubin in neonates

CLINICAL FINDINGS

Dysuria, inc. frequency, urgency, hematuria, suprapubic pain. Cystitis-only is afebrile.

+ fever w/ CVA tenderness if pyelonephritis

PATHOGENS

Often mixed vaginal flora, *E. coli* most common pathogen for UTI in non-pregnant women

MANAGEMENT

Uncomplicated cystitis: Nitrofurantoin x5 days

Pyelonepehritis: Ciprofloxacin x7 days + one time IV dose of ceftriaxone for severe infection

SEPTIC PELVIC THROMBOPHLEBITIS

- Infection of pelvic venous plexus
  - Thrombosis risk increased during pregnancy due to Virchow's triad
  - In SPT, inflammation of vessel wall and micro-abscesses occur at site of thrombosis
- Risk factors: C-section, chorioamnionitis
- CT or MRI imaging can aid in diagnosis, thrombi visualized in pelvic veins

CLINICAL FINDINGS

Persistent fever after 3-5 days of appropriate antibiotics

PATHOGENS

Blood cultures often negative and pathogens not well identified. Reported cases include Strep, enterobacter, anaerobes but in most histopathology samples, no bacteria seen.

MANAGEMENT

Similar to endometritis/empiric PP fever treatment: IV gent + clinda or amp/sulbactam ~ 1 week

Anticoagulation remains controversial, some clinicians provide heparin x1-6wks depending on extent of thrombosis however insufficient data currently.

MASTITIS

- Infectious or non-infectious breast inflammation
  - Non-infectious causes: milk stasis (incomplete emptying)
    - Breast engorgement can also cause benign elevation in temperature
  - Infectious: cellulitis, abscess, lobular tissue infection
- 12% of all postpartum infections, often present with delayed postpartum fever (>1 week PP)

CLINICAL FINDINGS

High fevers, rigors, myalgias often present before breast signs (tender, firm red area of breast)

Non-infectious causes tend to present with bilateral symptoms

PATHOGENS

S. aureus most common, also Coag neg Staph

MANAGEMENT

Continue breastfeeding/breast emptying. Pain relief: ice packs, breast support, NSAIDs

Dicloxacillin or cephalexin if low risk for MRSA, Clindamycin if at risk for MRSA

MANAGEMENT REVIEW

PPD 0 "WIND"	**PPD 1-2** "WATER"	**PPD 2-3** "WOMB"	**PPD 4-5** "WOUND"	**PPD 5-8** "WALKING"	**PPD 7-21** "WEAN"
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• Pulmonary exercises (incentive spirometry) •Ambulation	• Abx per urine culture	• Gentamicin + clindamycin (cover polymicrobial agent) • No cultures necessary	• Antibiotics for cellulitis • Open/drain wound w/ sterile packing BID	• Heparin/Lovenox •For SPT, same Abx as endometritis • ± Heparin 1-6wks	• Antibiotics for cellulitis • Keep breastfeeding or breast-emptying • I&D abscess if present

PREVENTION

- WHO put out evidenced-based guidelines on prevention of peripartum maternal infections. Relevant recommendations include:

Routine chlorhexidine vaginal cleansing during labor for infection prevention	NOT recommended
Routine antibiotic prophylaxis during 2nd/3rd trimester for infection prevention	NOT recommended
Antibiotics given for women with **PPROM**	Recommended
Routine Abx prophylaxis for women undergoing **manual removal of placenta**	Recommended
Routine Abx prophylaxis for women undergoing **operative vaginal delivery**	NOT recommended*
Routine Abx prophylaxis for women with **3rd/4th-degree perineal tear**	Recommended
Vaginal cleansing with iodine prior to **C-section delivery**	Recommended*
Routine Abx prophylaxis for women undergoing **C-section delivery** Abx given prior to skin incision Recommend 1st gen cephalosporin or penicillin	Recommended

* Conditional recommendation

IMPORTANT LINKS & REFERENCES

1. Dalton E, Castillo E. Post partum infections: A review for the non-OBGYN. *Obstetric Medicine*. 2014;7(3):98-102.
2. Yokoe DS, Christiansen CL, Johnson R, Sands KE, Livingston J, Shtatland ES, Platt R. Epidemiology of and surveillance for postpartum infections. *Emerg Infect Dis*. 2001; 7(5):837-41
3. Garcia J, Aboujaoude R, Apuzzio J, Alvarez JR. Septic Pelvic Thrombophlebitis: Diagnosis and Management. *Infectious Diseases in Obstetrics & Gynecology*. 2006;2006:15614.
4. Wong, AW, Lo BM. Postpartum Infections. *Medscape*. Jan 2017.
5. Puerperal Complications. In: Cunningham F, Leveno KJ, Bloom SL, Spong CY, Dashe JS, Hoffman BL, Casey BM, Sheffield JS. eds. Williams Obstetrics, Twenty-Fourth Edition New York, NY: McGraw-Hill; 2013.
6. UptoDate:
   - Overview of the postpartum period: Physiology, complications, and maternal care, Feb 2018
   - Septic Pelvic Thrombophlebitis, Jan 2018.
   - Common problems of breastfeeding & weaning, Nov 2017.
7. World Health Organization. "WHO Recommendations for Prevention and Treatment of Maternal Peripartum Infections." 2015