Post-Partum Infections

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NO DISCLOSURES

Post-Partum Period

- The time following delivery during which pregnancy-induced maternal anatomical and physiogical changes return to the non-pregnant state.
- Duration considered to be between 4 and 6 weeks
- Much less complicated than pregnancy but still has its complications

Post-Partum Infection

- Any bacterial infection of the female genital tract after delivery
- Usually occur after the first 24 hours and within the first 10 days post partum
- Along with preeclampsia and post partum haemorrhage formed lethal triad of maternal death causes before and during the 20th century
- One of the major contributors to maternal mortality

Post-Partum Pyrexia

- Normal core body temperature is 37-37.5 °C
- Post-partum pyrexia is an oral temperature of 38.0°C or more on any two of the first 10 days post-partum, or 38.7°C or higher during the first 24 hours
- Common following delivery however all not of infective origin

Post-Partum Pyrexia

- Causes can be separated into broad categories:
  - Benign fever
  - Breast engorgement
  - Infections of the urogenital tract
  - Other distant infections

Post-Partum Infections

- Urogenital tract infections:
  - Uterus
  - Adnexal abscesses and peritonitis
  - Septic pelvic thrombo-phebitis
  - Perineum
  - Urinary tract

- Distant infections:
  - Abdominal incision
  - Mastitis

Uterine Infection

Uterine Infection

- Infection of the decidua (endometritis)
- Extension to myometrium (endomyometritis) or parametrium (parametritis)
- Also termed metritis with pelvic (parametrial) cellulitis
- Cellulitis can be so severe an area of induration (phlegmon) within the leaves of the broad ligament can form

Microbiology

- Typically polymicrobial
- Mixture of 2-3 aerobes and anaerobes indigenous to female genital tract

- Cervix and vagina routinely harbor bacteria while uterine cavity sterile until membrane rupture

Microbiology

- Common pathogens:
  - Aerobes
    - Gram-positive cocci – Group A, B & D streptococci, enterococcus, staphylococcus aureus, staphylococcus epidermidis
    - Gram-negative bacteria – Escherichia coli, Klebsiella, Proteus species
    - Gram-variable – Gardnerella vaginalis
  - Others
    - Mycoplasma, Chlamydia species and Neisseria gonorrhoea
  - Anaerobes
    - Cocci – Peptostreptococcus, and Peptococcus species
    - Others – Clostridium, Bacteroides and Fusobacterium species, Mobiluncus species

Risk Factors

- Caesarean delivery is the single most important risk factor
- Metritis following vaginal delivery is relatively uncommon

Risk Factors

- Prolonged labour
- Prolonged rupture of membranes
- Multiple cervical examinations
- Intrapartum chorioamnionitis
- Manual removal of the placenta
- Internal foetal monitoring
- Lower socio economic status
- Maternal diabetes mellitus
- Preterm birth
- Colonization of lower genital tract with Group B strep
- Obesity
- Meconium stained amniotic fluid

Clinical Features

- Fever

- Tachycardia
- Midline lower abdominal pain
- Uterine tenderness
- Parametrial tenderness on bimanual examination
- Purulent or foul smelling lochia
- Chills
- Malaise

- Increased WBC

Prevention

- Antimicrobial:
  - Single dose antimicrobial prophylaxis within 60 min prior to skin incision for all women undergoing caesarean delivery
  - Ampicillin OR First-generation cephalosporin is ideal
  - Vancomycin in addition to cephalosporin if known colonization with MRSA
- Operative technique:
  - Alllowing placenta to separate manually

Treatment

- Indicated for relief of symptoms and to prevent sequelae
- Septic patients require prompt administration of antibiotics
- Same treatment regardless of mode of delivery
- Intravenous therapy with broad-spectrum antimicrobial coverage
- Once afebrile for 24-48 hrs can be discharged without need of continued oral therapy

Treatment

Regimen	Comments
Clindamycin 900mg q8hrly + Gentamicin 1.5mg/kg q8hrly OR 5mg/kg q24hrly	"Gold Standard" 90-97% efficacy
	+
	Ampicillin added to regimen with sepsis or suspected enterococcal infection
Clindamycin + aztreonam	Gentamicin susbstitute with renal insufficiency
Extended-spectrum penicillins	Piperacillin, ampicillin/sulbactam
Cephalosporins	Cefotetan, cefotoxitin, cefotaxime
Imipenem + Cilastatin	Reserved for special indications

Treatment

- Vancomycin can be used if staphylococcus aureus infection suspected
- Metronidazole (added to ampicillin + gentamicin) is another option

Treatment

- Oral and intramuscular regimen include:
  - Clindamycin 600mg PO every 6 hours + gentamicin 4.5mg/kg IM every 24 hours
  - Amoxicillin-clavulanic acid 875mg PO every 12 hours
  - Amoxicillin 500mg with metronidazole 400 mg PO every 8 hours

Persistent Fever

- Resistant organisms eg. enterococci
- Phlegmon – fever takes 5-7 days to resolve but can persist longer
- Consider other etiologies
- Retained products of conception within uterus

Adnexal Abscesses & Peritonitis

Adnexal abscesses

- If ovarian:
  - Rarely develop in the puerpuerium
  - Thought to be due to bacterial invasion through opening in ovarian capsule
  - Unilateral
  - Present 1-2 weeks post delivery
  - Often rupture and can cause severe peritonitis

Adnexal abscesses

- If not ovarian:
  - Can be due to severe cellulitis of uterine incision causing necrosis and separation
  - Extrusion of purulent material and abscess formation

Adnexal abscesses

- Diagnosis is by CT or MRI
- Treatment:
  - Broad spectrum antibiotics
  - Drainage
  - Surgical debridement of necrotic tissue

Peritonitis

- Peritonitis is rare but can follow caesarean delivery
- Almost always preceded by metritis
- Causes:
  - Necrosis and dehiscence of uterine incision
  - Ruptured adnexal abscess
  - Inadvertent bowel injury intra operatively

Peritonitis

- Clinical features:
  - Features of metritis
  - Abdominal distension
  - Abdominal rigidity

- Treatment:
  - If infection spreads from intact uterus – IV antibiotics
  - If uterine incisional necrosis or bowel perforation – surgical intervention

Septic Pelvic Thrombophlebitis

Septic Pelvic Thrombophlebitis

- Frequent sequelae of metritis in pre-antibiotic era
- Pathogenesis:
  - Endothelial damage due to spread of uterine infection to ovarian and uterine vessels
  - Venous stasis resulting from pregnancy induced ovarian venous dilatation and lower post partum pressures
  - Hypercoaguable state of pregnancy

Septic Pelvic Thrombophlebitis

- Incidence:
  - Occurs in 1:9000 vaginal deliveries and 1:800 caesarean deliveries
- Diagnosis:
  - Persistent unexplained fever despite antibiotic therapy
  - No definitive test
  - Imaging may not always show thrombus
  - Presumed if fever decreases after empiric systemic anticoagulation

Septic Pelvic Thrombophlebitis

- Treatment:
  - Broad spectrum antibiotics to cover common metritis pathogens
  - Anticoagulation to prevent further thrombosis

Perineal Infections

Perineal Infections

- Episiotomy infections are not common as episiotomies are done less frequently
- Dehiscence is main concern and infection is most common cause
- Fourth degree laceration infection likely to be more serious

Perineal Infections

- Clinical Features:
  - Local pain
  - Purulent discharge
  - Fever
  - Dysuria (with or without urinary retention)
  - Oedema, ulceration and exudation of the vulva

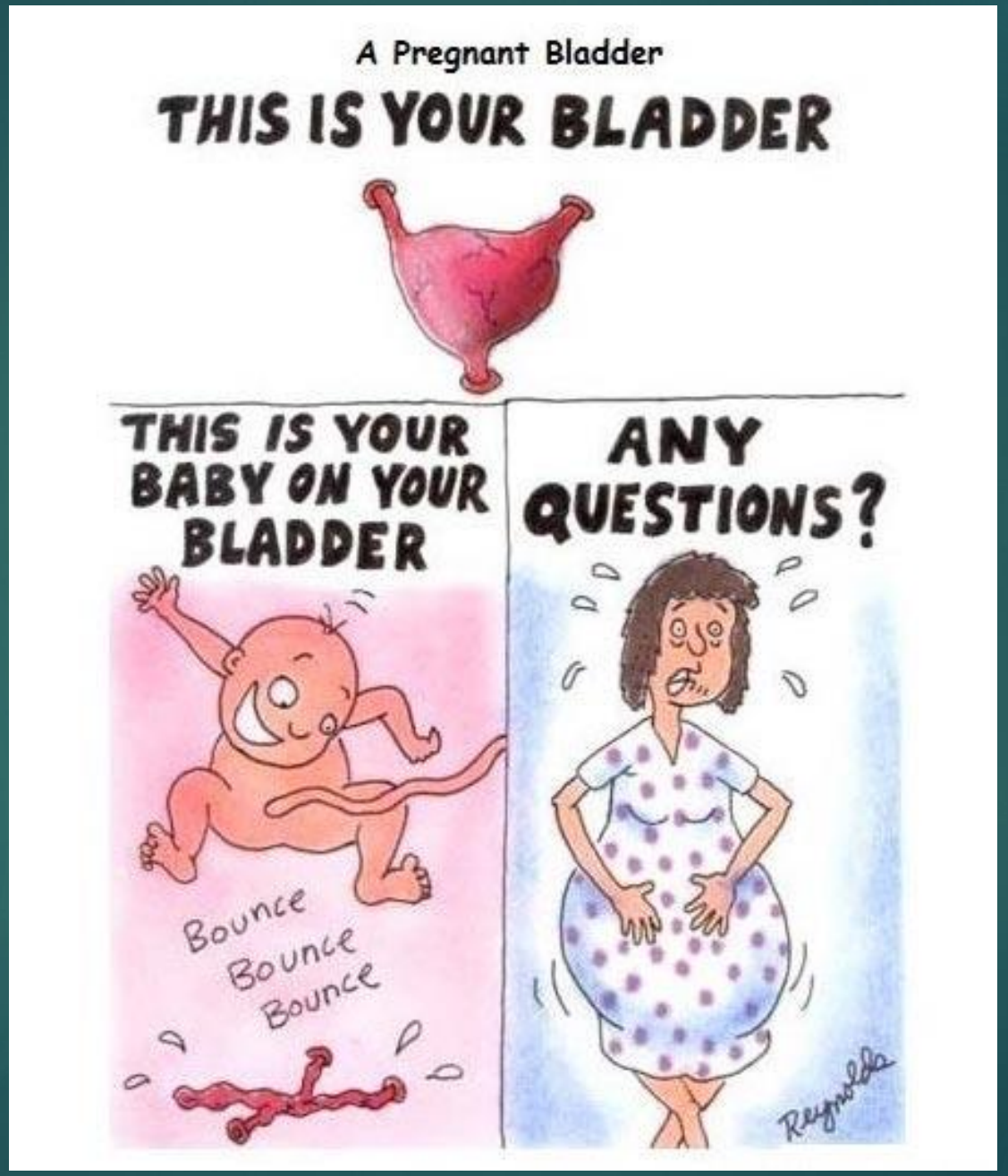
Perineal Infections

- Treatment:
  - Establish drainage
  - Remove sutures
  - Debride infected wound
  - Sitz baths several times daily
  - Broad spectrum antibiotics

- If cellulitis but no purulence close observation and antibiotic therapy alone appropriate

Perineal Infections

- If dehiscence:
  - Local wound care and IV antibiotics
  - Can be repaired once surface free of infection and exudate and good granulation present


A Pregnant Bladder
THIS IS YOUR BLADDER
THIS IS YOUR BABY ON YOUR BLADDER
Bounce
Bounce
Bounce
ANY QUESTIONS?

Urinary Tract Infections

- Bladder over distension is common early in puerperium
- Risk factors increasing chance of retention:
  - Primiparity
  - Perineal lacerations
  - Oxytocin induced or augmented labour
  - Labour lasting >10 hours
  - Operative vaginal delivery
  - Catheterization during labour

Urinary Tract Infections

- Gram-negative organisms from GI tract are usually causative
- Clinical features:
  - Cystitis – frequency, urgency, dysuria, suprapubic pain
  - Pyelonephritis – costovertebral angle tenderness, fever, chills and rigors, nausea and vomiting
- Investigations
  - Urinalysis
  - Urine culture
  - WBC

Urinary Tract Infections

- Treatment:
  - Broad spectrum antibiotics empirically

Abdominal Incisional infections

Abdominal Incisional infections

- Common cause of persistent fever in women treated for metritis
- Usually cause persistent fever or fever beginning approximately 4th day post partum
- Prophylactic antibiotics prior to caesarean delivery decrease incidence to less than 2%
- Causative organisms are usually those common to metritis infection or can be hospital acquired

Abdominal Incisional infections

- Can result in fascial dehiscence due to necrosis of fascia

Abdominal Incisional infections

- Risk factors:
  - Obesity
  - Diabetes
  - Corticosteroid therapy
  - Immunosuppression
  - Anaemia
  - Hypertension
  - Inadequate hemostasis with hematoma formation

Abdominal Incisional infections

- Treatment:
  - Empiric broad spectrum antimicrobials
  - Surgical drainage and removal of necrotic tissue if incisional abscess (inspect fascia to ensure intact at time of surgery)
  - Fascial repair
  - Wound care twice daily
  - Can have secondary closure around day 4-6 when healthy granulation tissue present

Abdominal Incisional infections

- Necrotizing fasciaitis is an uncommon complication

- Severe wound infection with tissue necrosis
- Infection can involve skin, superficial and deep subcutaneous tissue or any fascial layer
- Associated with high mortality

- Caused usually by organisms that comprise normal vaginal fluora or virulent bacterial species such as group A B-hemolytic streptococcus

Abdominal Incisional infections

- Treatment:
  - Broad spectrum antibiotics
  - Prompt fascial debridement until healthy bleeding tissue reached
  - In extensive resection synthetic mesh may be required to close fascia

Mastitis

Mastitis

- Infection of the mammary gland parenchyma
- Occurs in up to a third of breastfeeding women
- Found more commonly in women who have difficulty nursing
- Occur between 1 and 4 week post partum
- Unilateral with engorgement preceding inflammation

Mastitis

- Clinical features:
  - Fever, chills or rigors
  - Tachyardia
  - Severe breast pain
  - Firm, erythematous breast

- Staphylococcus aureus (esp. MRSA) is most commonly isolated organism
- Coagulase negative staph and streptococcus viridans also seen

Mastitis

- Milk can be cultured to detect causative agent
- Infection usually resolves within 48 hours if appropriate antibiotics commenced before suppuration commences
  - Dicloxacillin 500mg PO every 6 hours empirically
  - Clindamycin 450mg every 8 hours if penicillin allergy
  - Vancomycin if MRSA suspected
- Antibiotics should continue for 10-14 days even though clinical response may be prompt

Mastitis

- Mothers should be encouraged to continue breast feeding
- Milk should be expressed if infant not feeding on affected breast
- Breast abscess occurs in approximately 10% of mastitis cases
- Should suspect abscess if fever persists more than 48-72 hours after commencing antimicrobial therapy

Breast abscess

- Tender, fluctuant, palpable mass can be felt
- Can be diagnosed using ultrasound
- Treatment:
  - Empirical antimicrobial coverage
  - If overlying skin intact – needle aspiration under ultrasound guidance
  - If overlying skin compromised – surgical drainage

What can we do?

- Proper counselling regarding breast, wound and general self care post delivery prior to and after delivery
- Counsel on signs and symptoms of infection and inform patient to present for assessment as early as possible if any arise
- Encourage patients to call if they have any queries
- Knowing when to refer for assessment and/or admission

Thank You