Maternal Sexually Transmitted Infections in Pregnancy

Course Objectives
1. Describe the most common perinatal infections
2. Identify three maternal infections that could cause significant morbidity or mortality in the neonate.
3. Describe vertical transmission of HIV from infected mothers to their infant.

Reason for Concern??
- Diagnosis, Treatment and Prevention are Key
- Impaired fertility
- Adverse pregnancy outcomes
- Ectopic pregnancy
- Pregnancy loss
- PTL
- Newborn illness/death
- Maternal illness/death

Sexually Transmitted Diseases
- Clinical Syndromes and Infections caused by pathogens that can be acquired and transmitted by sexual activity
  - Bacterial
  - Viral
  - Parasitic
  - Protozoan

Recommendations
- Newly Released June 5, 2015
- Centers for Disease Control and Prevention
  - Morbidity and Mortality Weekly Report Volume 64, No. 3
  - Sexually Transmitted Diseases Treatment Guidelines, 2015

Clinical Prevention Guidelines
- Accurate risk assessment and education focusing on ways to avoid STDs and changing sexual behaviors and recommendations for prevention
- Determining if individual has been vaccinated if there infection in question has a preventable vaccine
- Identification of the STD in the asymptomatic and symptomatic individuals
Clinical Prevention Guidelines

- Diagnosis, treatment, counseling, and follow up of infected persons
- Evaluation, treatment, and counseling of sex partners of persons who are infected with an STD

Obtaining a Sexual History

- CDC: [http://www.cdc.gov/std/treatment/resources.htm](http://www.cdc.gov/std/treatment/resources.htm)
- CDC curriculum: [http://nnptc.org/clinical-ppts](http://nnptc.org/clinical-ppts)
- Interviewing in a non-judgemental, respectful and compassionate way
- Develop a rapport and use open-ended questions and use understandable and in "normal" language

5 “P”s approach

- Partners – who, how many
- Practices – safe vs unsafe, orifices
- Prevention of Pregnancy – what is being used to prevent pregnancy
- Protection from STD – How do they protect themselves
- Past history of STDs

Recommended Screening Tests in Pregnancy

- HIV
- Syphilis
- Hepatitis B
- Chlamydia
- N. gonorrhoeae
- "Hepatitis C"
- Bacterial Vaginosis
- Trichomonas Vaginalis
- HSV

Bacterial Infections

- Single-cell “living” microorganism
- Treatment antibiotics
- Ability to develop resistance
- Examples:
  - Bacterial Vaginosis
  - Group B Strep (not considered STI)
  - Chlamydia
  - Gonorrhea
  - Syphilis
### Bacterial Vaginosis (BV)

**Organisms:**
- Over population of anaerobic gram negative rods
- Major organisms: Gardnerella, Prevotella, Mycoplasma, Ureaplasma, Mobiluncus

**Transmission/cause:**
- Sexual transmission
- Douching (changes vaginal flora)

**Risks:**
- Increased risk of PTL and PROM

### Symptoms
- Watery, odorous discharge,
- May be asymptomatic

### Diagnosis
- White discharge that coats vaginal wall
- pH > 4.5

### Treatment of symptomatic women in pregnancy
- Metronidazole 250-500 mg orally BID x 7 days
- OR
- Clindamycin 300mg orally BID x 7 days

### Treatment of asymptomatic women in pregnancy is controversial

### Group Beta Strep

**Organism:**
- Gram-positive coccus

**Transmission:**
- Frequently colonizes GI and GU tract

**Risks:**
- Maternal: Cystitis, Pyelonephritis, Chorioamnionitis, Endometritis, Bacteremia
- Newborn: Sepsis

### Symptoms
- Asymptomatic
- UTI symptoms

### Diagnosis
- Urine culture (at least on prenatal)
- Rectovaginal culture (35-37 weeks)
- Rapid screen if available

### Who Should Get Intrapartum Antibiotic Prophylaxis
- Positive screening culture
- Positive history of birth of an infant with early-onset GBS disease
- GBS bacteriuria during the current pregnancy
- Unknown culture status (culture not performed or result not available)
Group Beta Strep

Treatment:

Prenatal Bacteriuria:
- Amoxicillin, PCN or cephalexin with f/u cultures

Intrapartum Treatment:
- Recommendation is to test for sensitivity and determine antibiotic allergies are present
- Best Treatment is with PCN
- Initial dose: Penicillin G 5 mu IV
- Subsequent doses: 2.5 - 3 mu PCN IV q 4 hours until delivery

MOST EFFECTIVE: 4 HOURS PRIOR TO DELIVERY!

Group Beta Strep

Treatment for PCN Allergic:

- PCN Allergy:
  - Initial dose: Cefazolin 2 gms IV
  - Subsequent doses: Cefazolin 1 gm every 8 hours until delivery

- PCN Allergy with high risk for anaphylaxis:
  - Need to do antibiotic susceptibility testing to see if sensitive to Clindamycin or erythromycin
  - Nonsusceptibility: Vancomycin 1 gm q 12 hours (normal renal function) until delivery

Syphilis

Organism:
- Spirochete Treponema pallidum

Transmission:
- STD
- Vertical transmission: in utero or during delivery

Risk of transplacental infection of fetus:
- Potential adverse outcomes:
  - Perinatal death, premature delivery, low birth weight, congenital anomalies, active syphilis in neonate, long-term sequelae such as deafness and neurologic impairment

Syphilis

Diagnostic:
- Direct visualization of spirochetes under microscope
- Serological testing:
  - Nontreponemal antibody test
  - Venereal Disease Research laboratory VDRL test
  - Rapid Plasma Reagin RPR test

Symptoms:
- Early (2-3 wks after exposure):
  - Painless papule forms (0.5-2cm) which ulcerates to lesion
- Secondary (3-6 wks after primary stage resolves):
  - Some non-specific [malaise, sore throat, headache, weight loss, low-grade fever, or muscle aches]
  - More specific include: rash on hands and feet, mucosal lesions, alopecia, lymphadenopathy
- Latent
  - Dormant, seroreactive disease
- Late:
  - Inflammatory response in any organ system
  - Neurosyphilis- asymptomatic or symptomatic
Syphilis

Treatment:
- Early (infected within last year)
  - Benzathine PCN G LA 2.4 µg IM x 1
- Latent or unknown duration:
  - Benzathine PCN G LA 2.4 µg IM once dose weekly x 3

Test of cure:
- Serological testing 1, 3, 6, 12 and 24 months after treatment.

Chlamydia

- Organism
  - Gram-negative
- Transmission
  - Most common STD (often coinfections)
- Risks
  - Ectopic, PROM, PTL, Neonatal conjunctivitis and pneumonia
- Symptoms:
  - Often asymptomatic
  - Cervicitis or urethritis

Chlamydia

Diagnosis:
- Nucleic acid amplification (NAAT)
  - First catch urine
  - Vaginal secretions
Treatment:
- Azithromycin 1 gram orally preferred
- Test of cure: > 3 weeks

Bacterial: Gonorrhea

- Organism
  - Gram negative diplococci
- Transmission
  - Sexual contact
- Diagnosis:
  - Culture

Gonorrhea Discharge

Symptoms:
- Cervicitis
- Urethritis
- Rectal lesions

Treatment:
- Ceftriaxone 250 mg IM plus Azithromycin 1 gram PO (Chlamydia often copathogen) x 1 dose
- Test of cure: not needed if asymptomatic

Gonorrhea
Neonatal Gonococcal Conjunctivitis

Acute illness in neonate occurs 2-5 days after delivery and can be severe enough to cause meningitis and infection at area of Internal Fetal Scalp Electrode.

Protozoan Infection
- Living, one-celled organisms that can live inside or outside the cell
- Susceptible to some antibiotics
- Examples:
  - Trichomoniasis

Trichomoniasis
- **Organism:** Protozoan parasite *Trichomonas vaginalis*
- **Transmission:**
  - Genital contact
  - Shared towels, bathing suits, etc. Can live in damp areas outside the body for a few hours.

Trichomoniasis
- **Symptoms in women:**
  - Frothy thin, gray or greenish-white vaginal discharge
  - Itching and redness in the vaginal area
  - Pain on urination
  - Strawberry cervix
- **Diagnosis:**
  - Culture
  - Wet prep viewed under the microscope
  - Urine

Trichomoniasis
- **Risks:**
  - Complications in pregnancy
  - Preterm birth
  - Low birth weight
  - Newborn complications
  - Pneumonia
  - Urogenital colonization.

Trichomoniasis
- **Treatment - both partners**
  - Metronidazole 2 g orally x 1 dose OR
  - Metronidazole 500mg BID x 7days
  - Tinidazole 2 g orally in a single dose
Viral Infections

- Capsules of genetic material
- Require living host to multiply
- Can lie dormant in cells until triggered to multiply
- Asymptomatic or symptomatic
- Treatable but not curable
- Examples:
  - Hepatitis B and C
  - Herpes Simplex
  - HPV
  - HIV

Hepatitis B

- **Organism:**
  - Hepatitis B virus
- **Transmission:**
  - Sexual contact
  - Contaminated sharps
  - Maternal-infant transmission: in utero, birth or after birth.
- **Risks:**
  - Liver inflammation
  - Liver failure/death
  - Almost all newborns and 50% of children develop chronic hepatitis

**Diagnosis:**
- Antibody to HBsAg (Anti-HBs) -- either had hepatitis B in the past, or have received a hepatitis B vaccine
- Antibody to hepatitis B core antigen (Anti-HBc) -- recent infection or an infection in the past
- Hepatitis B surface antigen (HBsAg) -- have an active infection
- Hepatitis E surface antigen (HBeAg) -- have active hepatitis B infection and more likely to spread the infection

Hepatitis B

- **Signs/Symptoms:**
  - Jaundice
  - Fatigue
  - Abdominal pain
  - Loss of appetite
  - Nausea and vomiting
  - Joint pain

Maternal Treatment for Hep B Virus Exposure in Pregnancy

- Maternal exposure with negative HBsAg:
  - Hepatitis B immune globulin (HBIG) dose of 0.06 ml/kg IM
  - Repeat in one month
  - Follow with hepatitis vaccine series
  - Disease contracted during pregnancy
  - Treatment based on symptoms

Diagnosis:
- Antibody to HBsAg (Anti-HBs) -- either had hepatitis B in the past, or have received a hepatitis B vaccine
- Antibody to hepatitis B core antigen (Anti-HBc) -- recent infection or an infection in the past
- Hepatitis B surface antigen (HBsAg) -- have an active infection
- Hepatitis E surface antigen (HBeAg) -- have active hepatitis B infection and more likely to spread the infection
Hepatitis B
- Hepatitis B Treatment of Exposed Newborns
  - Immunization prevents HBV infection in about 95% of exposed newborns
  - Regimen for exposed newborns:
    - HBIG 0.5ml and HBV vaccine IM within 12 hours of birth
    - Subsequent vaccines at 1-2 and 6 months of age
    - Preterm newborns (<2 kg at birth) receive 4 total doses
    - Follow up studies at 1-3 months post vaccination series

Hepatitis C
- Not efficiently transmitted sexually
- Sexual transmission can occur in the patient with HIV
- More commonly seen with practices of group sex and use of cocaine and other stimulants during sex

Genital Herpes- HSV-1 & 2
- Organism:
  - Herpes simplex virus (HSV 1&2)
- Most common cases are HSV-2
- Transmission:
  - Direct contact
- Diagnosis:
  - Visualization of lesions
  - Viral culture
  - Serologic type-specific testing

Symptoms of Primary HSV-2
- Prodromal (2-4 days)
  - Neuralgia (nerve pain)
  - Paresthesia (tingling)
  - Hypoesthesia (decreased sensation)
- Pustules (approximately 6 days)
  - Painful vesicular lesions
  - Dysuria
  - Fever
  - Malaise
  - Cervicitis

HSV
- Treatment of HSV in Pregnancy:
  - Assessment of symptoms and present of lesions
  - Acyclovir for first, severe, frequent recurrent episodes and disseminated HSV infection
- Cesarean Birth
  - Active genital lesions
  - ASAP with ROM and Active infection
  - Assessment of risk-benefit for internal fetal monitoring with no active lesions
  - Contact precautions

HSV
- Neonatal Treatment:
  - Mucocutaneous/Ocular
    - Acyclovir 45 mg/kg/day IV q8 hours x 14 days
  - CNS and/or Disseminated Disease
    - Acyclovir 60 mg/kg/day IV q8 hours x 21 days
Human Immunodeficiency Virus (HIV)

- **Organism:**
  - Human immunodeficiency virus (HIV)

WA State Statistics

- Most are Black and Non-Hispanic women – 43%
- White women – 33%
- Between 2009-2013 - New diagnosis
  - Median age 36 years old
  - 40% were over age of 40
  - 10% were infants and children
  - Average is 78 cases per year
  - 2 new cases per 100,000 women that live in WA

Risky Behavior of WA women

- Injection Drug Use = 23%
- Heterosexual Contact = 71%
- Blood exposure = 6%

Human Immunodeficiency Virus (HIV)

**STAGES OF HIV INFECTION:**

- **Stage I** – acute HIV infection. An illness similar to mononucleosis or the flu develops – 2-8 weeks
- **Stage II** – asymptomatic HIV infection. Person will test positive for HIV but will have no symptoms – years
- **Stage III** – Persistent generalized lymphadenopathy - years
- **Stage IV** – AIDS - years
- Other symptoms: fatigue, skin rashes, diarrhea, yeast infections, and memory changes as the virus invades the immune system.

HIV

- Transmission via bodily fluids such as blood, semen, vaginal secretions and breast milk
  - Fluids can enter the system of another individual through broken skin and through mucus membranes, including those found in the mouth, vagina, cervix, rectum and urethra.
  - Saliva has not been shown to be a transmissible body fluid for HIV
  - Co-infections of Chlamydia/Gonorrhea, syphilis, and herpes common

- Without treatment, the possibility of HIV transmission from mother to child is 15-30%
- With intervention and a mother with a low viral load, less than 2% chance of delivering an HIV-infected infant
**HIV**

- **Diagnosis:**
  - HIV viral antibody detection with enzyme immunoassay (EIA)
  - Confirmation of reactive EIA with Western Blot or immunofluorescence (IFA)
  - Rapid HIV test for women in labor with unknown status

**ZIDOVUDINE (ZDV) REGIMEN for HIV TREATMENT:**

- **Antepartum**
  - Oral ZDV 100mg 5 times/day
  - May use 200mg TID or 300mg BID

- **Intrapartum**
  - ZDV 2mg/kg IV over one hour, then 1mg/kg/hr IV until delivery

- **Neonatal (full term)**
  - Oral ZDV 2mg/kg q6hours for 6 weeks
  - ZDV 1.5 mg/kg IV q6 hours (newborns not tolerating oral intake)
  - Benefits of neonatal antiretroviral prophylaxis are best realized when it is initiated <12 hours after birth

**Other Antiretrovirals used in pregnancy**

- Goal is the lowest viral load possible — preferably under 1000 copies/mL
- Testing for drug resistance
- Combination Antiretroviral Therapy (cART)
- Need to continue therapy
- Efavirenz
- Nevirapine

**HIV Resources:**

- Information for the mother
- Guidelines for management of mother and infant for hospital and clinic

**HIV: Suggested Resources**

- United States Public Health Service
  - Perinatal HIV Guidelines Working Group:
    - Recommendations For Use Of Antiretroviral Drugs In Pregnant HIV-1 Infected Women For Maternal Health And Interventions To Reduce Perinatal HIV-1 Transmission In The United States
Human Papilloma Virus (HPV)

- **Organism:**
  - Caused by human wart viruses:
    - HPV types 6 & 11 most common visible genital warts; others associated with cervical neoplasia
- **Transmission:**
  - Sexual contact

HPV

- Maternal Risks:
  - Some types associated with cervical cancer
  - Increase in size
  - Friable

- Complications in pregnancy
  - Very rarely, a pregnant woman with genital HPV can pass HPV to her baby during vaginal delivery.
  - Cesarean delivery not recommended - unclear if it prevents RPR in infants and children
- Risks in Newborn:
  - No special precautions
  - Noncancerous warts in the throat, larynx with potential for recurrent respiratory papillomatosis (RRP).
  - RRP rare and usually not made until the child presents with symptoms, usually as a toddler and is often misdiagnosed

- Signs/symptoms:
  - Single or multiple growths around vagina, anus
  - Fleshy, pale pink or red in color
  - Raised or flat, small or large
  - Asymptomatic or associated itching, vaginal discharge, vulvar pain
  - Lesions may proliferate and become friable on vulva & vagina during pregnancy.

HPV

- Diagnosis:
  - Visualization
  - Pap Smear
  - Biopsy if diagnosis is uncertain
Parasites

HPV
- Treatment in Pregnancy:
  - Cryotherapy, laser therapy, & trichloroacetic acid preferred
  - Cesarean birth for extensive lesions that decrease vulvo-vaginal dispensability or obstruct birth canal

Parasitic: Pubic Lice
- Organism: Phthisis pubis: “crab louse”
- Symptoms:
  - Itching
  - Pale bluish macules with prolonged infestation
- Diagnosis:
  - Louse or nits (louse eggs)
- Treatment in Pregnancy: (not for lactating women)
  - Permethrin or pyrethrins with piperonyl butoxide topical applications

Ectoparasitic Parasitic Infections
- Living organisms that live, breed & die on host
- Transmission through direct contact and by sharing towels, bedding
- Treatable with lotions
- Types:
  - Pubic lice
  - Scabies

Scabies
- Tx: Permethrin 5% cream and washed off after 8-14 hours
  - Ivermectin (adult only) 200 ug/kg orally, repeated in 2 weeks
Fungal

Fungal Infection
- Not considered STI, however, more prevalent in pregnancy
- Asexual reproduction outside the host’s body
- Sexual reproduction when inside the host and depends on the host
- Responds to fungicides
- Examples:
  - Tinea cruris “jock itch”
  - Candidiasis- yeast infection

Fungal: Candida (“Yeast”)
- Organism:
  - Candida albicans 80-92%
  - NOT considered STD
- Symptoms:
  - Pruritus, dysuria [external], soreness, irritation
  - Little or no discharge
  - White and clumpy (curd-like)
- Diagnosis:
  - Wet mount of discharge (KOH to destroy cellular elements)
  - Culture for confirmation if indicated
- Treatment in pregnancy:
  - Clotrimazole (Lotrimin) topical cream
  - Miconazole (Monistat) topical cream