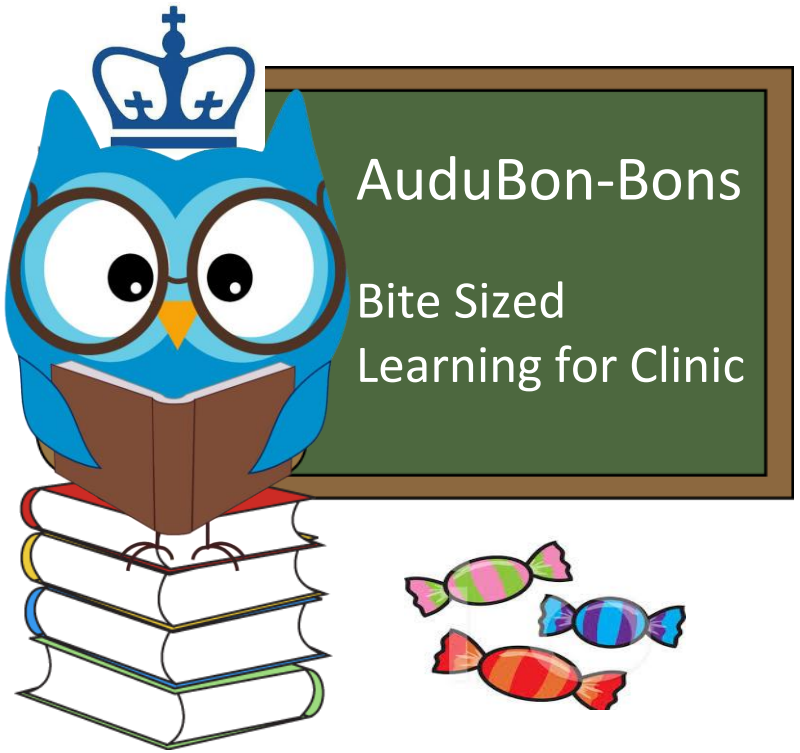
Varicella Exposure in Pregnancy



Week 98

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Reading Assignment:
ACOG Practice Bulletin # 151, June 2015

LEARNING OBJECTIVES

- Understand the background, clinical features, diagnostic testing, and management of varicella zoster exposure and infection in pregnancy

CASE VIGNETTE

- A 35 yo G2P1001 @ 16 weeks EGA presents with a rash and cough.

FOCUSED HISTORY

HPI: onset of diffuse, pruritic rash 5 days ago, now with worsening cough, subjective fevers at home. She denies recent travel. She denies recent sick exposures.

- **OBHx:** G1-FT NSVD
- **GynHx**: neg STIs, abnormal paps, fibroids, cysts
- **PMH:** denies
- **PSH:** denies
- **FH:** no history of cancer
- **SH:** **current tobacco use (1/2 ppd)**; no EtOH or drug use; **works as a kindergarten teacher's assistant**; lives with her husband and daughter and is safe at home
- **Meds**: PNV
- **All**: NKDA

PERTINENT PHYSICAL EXAM FINDINGS

Vital Signs: *120/80, P 120, RR 30, O2 Sat 90%, T 39.2 C*

- **Gen**: NAD
- **HEENT**: clear oropharynx
- **Chest**: decreased breath sounds at bilateral bases, **rhonchi** at R lower lobe
- **CVS**: S1S2, tachycardia
- **Abd**: soft, NT, gravid
- **GU**: deferred
- **Ext**: WWP
- **Skin**: **Diffuse vesiculopapular lesions on face, back, trunk, and extremities; most lesions crusted over**

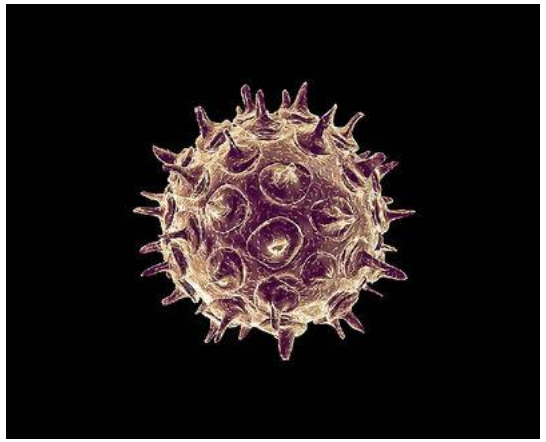
DIFFERENTIAL DIAGNOSIS

- **Viral exanthem**
  - Varicella (primary infection and herpes zoster), rubella, parvovirus, roseola, infectious mononucleosis, HIV

- **Bacterial infections**
  - Scarlet fever
  - Mycoplasma infection

OVERVIEW – VARICELLA ZOSTER VIRUS

- Highly contagious DNA herpesvirus
- Incidence of maternal varicella (2003-2010):
  - **1.21 per 10,000 pregnancies**



- Transmission
  - **Person-to-person:** Respiratory or contact
  - **Vertical transmission**

- Clinical forms
  - **Primary VZV infection***
    - Diffuse vesicular rash
    - +/- complications
    - <2% of cases are in adult population (>20 yrs); but account for 25% of deaths
  - **Herpes Zoster**
    - Reactivation of latent VZV infection, localized skin infection along dermatomal distribution

OVERVIEW – PATHOGENESIS (maternal infection)

- **Incubation period:** 10-20 days (mean 14 days) after exposure
  - Non-immune patient: 60-95% risk of becoming infected
- **Period of infectivity:** 48 hours before onset of rash until vesicular crusting
- **Symptoms:** 1-2 days viral prodrome (fever, malaise, myalgias), then intensely pruritic vesicular lesions (diffuse) that crust over in 3-7 days
  - Lesion progression: macules → papules/vesicles +/- pustular appearance → completion of crusted lesions by day 6 → resolution by 1-2 weeks afterwards

VARICELLA COMPLICATIONS

- **Varicella pneumonia**
  - 10-20% of pregnant women with VZV infection
    - Risk factors: smoking, >100 lesions
  - Maternal mortality: up to 40% (more commonly 1-2% with current treatment)
  - 3-5 days after onset of symptoms
  - Symptoms: cough, fever, dyspnea, pleuritic pain, tachypnea, ARDS

- **Other**
  - Neurologic (encephalitis, meningitis, cerebellar ataxia, ocular disease), renal (glomerulonephritis/AKI), cardiac (myocarditis), endocrine (adrenal insufficiency), death
  - Secondary bacterial infections (immunosuppressed populations usually)

FETAL AND NEONATAL INFECTION

- **Congenital varicella syndrome**
  - Overall risk: ***0.4-2%***
    - 1st trimester: 0.4%
    - 2nd trimester: 2% (almost 0% > 20 weeks)
    - 3rd trimester: 0%
  - Characteristics: chorioretinitis, microphthalmia, cerebral cortical atrophy, growth restriction, hydronephrosis, limb hypoplasia, cicatricial skin lesions

- **Neonatal infection**
  - Risk greatest with active maternal infection ***5 days BEFORE and 48 hours AFTER delivery***
  - 25-50% rates of infection, up to 30% mortality rates
    - Disseminated visceral and CNS disease usually fatal
    - Severe infections more common in preterm and LBW neonates

DIAGNOSIS

- Usually a **clinical diagnosis**:
  - Pruritic, vesicular rash

- **Laboratory testing**:
  - Viral DNA PCR testing from sample of fluid scraping of unroofed lesion
  - VZV culture from vesicular fluid (less sensitive, longer time to culture)
  - Serologic testing (VZV IgG) to rule out prior exposure
  - Chest x-ray: diffuse or miliary/nodular infiltrative pattern, peribronchial distribution

- What about **fetal testing**?
  - Ultrasonography after known infection (low sensitivity)
    - Hydrops, echogenic foci in the liver and bowel, cardiac malformations, limb deformities, microcephaly, IUGR
  - Viral DNA PCR testing from amniotic fluid, but positive result doesn't correlate well with development of congenital infection

MANAGEMENT

- **Maternal exposure**
  - Seronegative or no history of VZV: VZIG, ideally within **96 hours of exposure** but can be given **up to 10 days**
  - Seropositive or known history of VZV: no VZIG indicated

- **Maternal infection**
  - *isolate from pregnant women
  - What type of precautions should be initiated?
    - Airborne precautions and contact precautions
  - Work-up as indicated, consider CXR
  - Uncomplicated infection: acyclovir 800 mg PO 5 times a day x 7 days
  - Complicated infection: acyclovir 10 mg/kg q8 hr IV x 5-10 days
  - Treatment within 24 hours of exposure is most effective
  - Treatment does not impact congenital varicella syndrome rates

- **Neonatal exposure**
  - VZIG to infants exposed to women w/ active infection 5 days before and 2 days after delivery

- **Neonatal infection**
  - IV acyclovir to infant with symptoms within the 1st 2 weeks of life

MANAGEMENT - PREVENTION

- All nonpregnant women of reproductive age should be screened and vaccinated if no history or nonimmune serologies obtained
- All pregnant women should be screened and vaccinated after pregnancy if susceptible
- Vaccinations recommended, especially for those who interact with high risk populations
- Vaccination schedule
  - 12 years and older
  - 2 doses, 4-8 weeks apart
- Delaying pregnancy after vaccination:
  - 3 months
  - Termination not recommended even with exposure to VZV vaccine in early pregnancy

CASE VIGNETTE, CONTINUED

- **What is your differential for this patient?**
  - VZV infection, varicella pneumonia

- **How do you manage this patient?**
  - Isolation, airborne/contact precautions
  - Transfer to the hospital for inpatient management due to a complicated varicella infection presentation
  - Chest X-ray to assess for pneumonia
  - Acyclovir 10 mg/kg q8hr IV

BILLING AND CODING

- Diagnoses:
  - **O98.519**, Other viral diseases complicating pregnancy, unspecified trimester
  - **B01.9**, Varicella without complications
    - B01.2, Varicella pneumonia
    - B01.89, Varicella with other complications
  - **O35.3XX0**, maternal care for (suspected) damage to fetus from viral disease in mother, not applicable or unspecified
    - P35.8, Other congenital viral diseases

- CPT Code

E/M Code	Medical Decision Making[1]	History[1]	Exam[1]	Counseling and/or Coordination of Care	Time Spent Face to Face (avg.)
99241	Straightforward	Problem focused	Problem focused	Consistent with problems and patient's or family's needs	15 min.
99242	Straightforward	Expanded problem focused	Expanded problem focused	Consistent with problems and patient's or family's needs	30 min.
99243	Low complexity	Detailed	Detailed	Consistent with problems and patient's or family's needs	40 min.
99244	Moderate complexity	Comprehensive	Comprehensive	Consistent with problems and patient's or family's needs	60 min.
99245	High complexity	Comprehensive	Comprehensive	Consistent with problems and patient's or family's needs	80 min.

1 Key component. For office or other outpatient consultations, all three components (history, exam, and medical decision making) must be adequately documented in the medical record to substantiate the level of service reported and are crucial for selecting the correct code.

- In-hospital consult: bill as inpatient consult, 99251-5, at least 99253

EVIDENCE

- References

  - "Infectious Diseases." *Williams Obstetrics, 25e,* 2018. Eds. F. Gary Cunningham, et al.New York, NY: McGraw-Hill, http://accessmedicine.mhmedical.com/content.aspx?bookid=1918&sectionid=185094614.
  - Cytomegalovirus, parvovirus B19, varicella zoster, and toxoplasmosis in pregnancy. Practice Bulletin No. 151. American College of Obstetricians and Gynecologists. Obstet Gynecol 2015; 125:1510-25.
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  - Riley L et al. Varicella-zoster virus infection in pregnancy. Hirsch M and Lockwood C eds. UpToDate. Waltham, MA: UpToDate, Inc. https://www.uptodate.com/contents/varicella-zoster-virus-infection-in-pregnancy. Accessed July 20, 2019.
  - Lamont R et al. Varicella zoster virus infection in pregnancy. BJOG. 2011 September ; 118(10): 1155–1162. doi:10.1111/j.1471-0528.2011.02983.x.