Viral infections in Pregnancy

- Viruses with risk to pregnancy (possibly transmitted in healthcare setting)
  - HIV
  - Hepatitis B/C
  - Measles/Mumps/Rubella
  - CMV
  - Herpes: simplex; varicella
  - Parvovirus B19
  - Enteroviruses
  - Influenza

- Measles – can be deadly to mother; increased fetal demise and prematurity; peripartum – neonate get human normal immunoglobulin
- Mumps – increase 1st trim miscarriage; within 2 week delivery – risk neonatal thrombocytopenia, endocardial fibroelastosis, pneumonia
- Rubella – most dangerous first 11 weeks gestation - 90% congenital disease; > 16 weeks gest. – little risk

- Viruses with risk to pregnancy (possibly transmitted in healthcare setting)
  - HIV – intra utero transmission; breast milk transmission
  - Hepatitis B – 70-90% vertical transmission; 90% fetus chronic carrier; but can vaccinate/immunoprophylaxis
  - Hepatitis C – 5% transmission; neonates: 20% clear; 50% chronic asx; 30% chronic active infection

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- Viruses with risk to pregnancy (possibly transmitted in healthcare setting)
  - CMV – 90% asx in woman; 40% vertical transmission; 10% signs at birth; another 10-15% delayed recognition of sensorineural hearing loss and neurodevelopmental delays
  - Herpes: simplex; varicella
  - Parvovirus B19
  - Enteroviruses – low birthwt; premature; rare fetal demise
  - Influenza – miscarriage; fetal demise; ?congenital abnl; ?childhood leukemia; Mom risk of death third trimester; treat

Viral infections in Pregnancy: varicella

- Risks in first and second trimester
- Risks in third trimester
- Use of VZIG
- Use of Acyclovir
- Use of Vaccine

Viral infections in Pregnancy: varicella

Varicella in 1st or 2nd Trimester

- Fetal loss (?)
- Intrauterine growth retardation
- Preterm
- Malformations
- Congenital varicella syndrome (CVS)
- Fetal varicella syndrome (FVS)

- > 90% of woman immune
- If susceptible and exposed: 60-90% get infection
- 0.4 – 2% of infants get CVS
- 3rd trimester: no risk of CVS
- < 20 wks gest:
  - 1st trimester 0.55%
  - 2nd trimester 1.4%

- Congenital (Fetal) Varicella Syndrome (CVS)
  - Dermatomal scarring 70%
  - Limb hypoplasia 68%
  - Eye abnormalities 60%
  - Neurologic deficits 62%
  - Low birth weight 50%
  - Early death 29%
  - GI problems 20%
  - CV problems 7%

- High mortality rate – up to 30%

Viral infections in Pregnancy: varicella

Varicella in 1st or 2nd Trimester

- Toxoplasma gondii
- Rubella
- Cytomegalovirus
- Coxsackie virus
- HSV

Viral infections in Pregnancy: varicella

What is the chance see CVS?

US birth rate (2004): 4,140,090
Rate of varicella in pregnancy: 2:1000
Number with varicella: 8,280
Number in wks 1-20: 4,140
1% = 41 cases CVS/ year in US
Viral infections in Pregnancy: varicella

Varicella in any trimester

How Diagnose?
Clinical hx and exam
Culture of vesicle fluid and base
Tzanck smear of base and edge
Immunohistochemical stains

Varicella in 3rd Trimester

• Case Report:
  32 yo woman 38 2/7 wks pregnant with second pregnancy admitted to Bellevue because of 1 day history of vesicular skin eruption. Pt has no hx of having chicken pox or of vaccination. Derm is consulted to confirm diagnosis of varicella.

What should the obstetrician do?
  a. Induce labor to get the baby out while healthy?
  b. Prevent labor to keep baby in-utero where it is safe?
  c. Ask another obstetrician who knows, not the derm consult!!

What would you do if your resident asked you?

Morbidity greatest for mothers in last trimester
• Pneumonitis – develops 2-5 days after exanthem; can progress rapidly
• Mortality from pneumonitis – in past as high as 45%; decreased with antivirals and better respiratory support to 3-14%


Differential diagnosis of varicelliform eruption:
Viral: Herpes simplex (disseminated)
Disseminated Zoster
Other (enterovirus)
Bacterial: Impetigo
Rickettsial Pox
Fungal: Penicilliosis
Inflammatory dz: PLEVA
**Viral infections in Pregnancy: varicella**

**Varicella in 3rd Trimester Treatment**

If Mom with chicken pox in critical window 5 days before to 2 days after delivery – infant gets Varicella Zoster Immunoglobulin (VariZIG)


**Other times infants get VariZIG**

Neonatal exposure and mom not immune
Premies <28wks gestation or <1000gms exposed even if mom is immune


**Varicella in any Trimester Treatment**

Any pregnant woman with no varicella antibodies (no past infection and no vaccine) get VariZIG within 4 days of exposure (but can give up to 10 days)
- same household as known case
- face to face for 5 minutes
- same room for > 1 hour

No evidence VariZIG prevents CVS


**Varicella in any Trimester Treatment**

Can treat pregnant Moms with acyclovir
- give within 24 hours of onset eruption
- (10-15 mg/kg IV q 8 hrs for 5-10 days)

Non immune pregnant woman exposed:
- VZIG
- consider acyclovir 7th day past exposure (possible in fetus 2nd viremia causes CVS)


**Varicella in any Trimester Treatment**

Neonatal infection – treat with acyclovir
When need prophylaxis with VZig, some suggest also add acyclovir

**Viral infections in Pregnancy: varicella**

**Zoster in Pregnancy**

- NO PROBLEM
- Even if involves T10-L1 (uterine innervation)
- Viremia very unlikely
- Can treat with acyclovir (if severe)


**Vaccination in Pregnancy**

- DON'T DO IT!! Live attenuated vaccine
- Recommended avoid pregnancy for 3 months (Merck) or 1 month (AAP and CDC) after vaccine
- Merck/CDC registry pregnant and vaccine closed after 17 years (2013) – no reports of congenital varicella syndrome

http://www.merckpregnancyregistries.com/varivax.html


**Vaccination and Pregnancy**

- Vaccinate woman of child bearing potential
- Routinely screen pregnant woman for titers if unknown past infection or vaccination
- Vaccinate post-partum if no titers – vaccine compatible with nursing

**Viral infections in Pregnancy: varicella**

**Vaccination**

"Merck and the CDC have jointly agreed to discontinue the Merck/CDC Pregnancy Registry for Varicella-Zoster Virus (VZV) Containing Vaccines (VARIVAX®, ProQuad® and ZOSTAvAX®). Data collected for the pregnancy registry for over 17 years for VARIVAX and 6 years for ProQuad and ZOSTAvAX indicate that there have been no signals to indicate a risk of Congenital Varicella Syndrome or pattern of birth defects related to vaccination with the VZV-containing vaccines."

http://www.merckpregnancyregistries.com/varivax.html

**Viral infections in Pregnancy: varicella**

**Summary**

- Consider vaccinate woman of child bearing potential (when not pregnant)
- If non immune pregnant woman exposed – get VZIG
- If varicella in mom < 28 weeks gestation – need close follow up
- If varicella end of pregnancy – hold off delivery/ treat infant with VZIG if vesicles 5 days before to 2 days after birth


**Herpes Simplex in Pregnancy: primary**

- primary infection HSV risks:
  - intrauterine growth retardation
  - fetal demise
  - can have congenital HSV: CNS; eye; skin
  - neonatal HSV
  - if mom primary infection – can have disseminated in neonate: 30% mortality; 17% neurologic sequelae
  - localized: skin/mucosa; eye; with treatment < 2% mortality

Herpes Simplex in Pregnancy: recurrent

- Doctor, I have genital herpes.
- I am pregnant
- What do I do? – will I pass it to my child?

Parvovirus B19 in Pregnancy

- most women immune – but 1 European study 38% not
- < 20 weeks gest – miscarriage; 3% fetal hydropic; myocarditis; hepatitis; pleural/pericardial effusions; neuro defects; anemia;
- > 20 weeks gest – unclear risks
- not contagious once have arthritis or skin lesions
- if see pregnant pt with eruption of Parvo – check titers; OB will follow with ultrasound
- if no pregnant pt with eruption of Parvo – no need to worry about waiting room

Pityriasis Rosea in Pregnancy

- Mahajan et al review: birth abnormalities (hypotonia) resolved
- Other case reports of live unaffected births
- Need further studies
- Always check serologies for syphilis
- Monastirli et al: check nested PCR for HHV6/HHV7 DNA; consider acyclovir
- Mahajan et al – avoid systemic tx

Herpes Simplex in Pregnancy: recurrent

- How to prevent neonatal herpes:
  - diagnose herpes in mother – PCR most sensitive
  - treat pregnant women with acyclovir or valacyclovir
  - if known hx prenatal herpes – treat from 36 wks to delivery
  - c-section as needed per obstetrician

Pityriasis Rosea in Pregnancy

- PR possibly more common in pregnancy
- PR thought to be due to reactivation HHV-6 and/or HHV-7
- Drago et al study 61 affected pregnancies;
  - 8/61 miscarriage
  - 14/53 live birth - abnormalities
- PR in first 15 wks gestation asst with 57% miscarriage (3/14)
- PR in pts with systemic sxs; long duration; wide spread – may be greater risk of miscarriage

Pityriasis Rosea in Pregnancy

- Possible increase risk of miscarriage if exposed first trimester
- Consider advise pregnant women avoid people with PR
- Consider treat pregnant women with acyclovir – discuss risk/benefit; discuss with obstetrician
Zika Virus

- Zika virus can be passed from a pregnant woman to her fetus – rate unknown but may be as high as 89%
- Birth defects: include microcephaly, macular atrophy, craniofacial disproportion
- Zika primarily spreads through infected mosquitoes
- Zika sex transmitted: vaginal, anal, oral, shared sex toys (without a condom with someone infected by Zika)
- No vaccine and no specific therapy

Zika Virus: signs and symptoms

- often asymptomatic
- mild viral syndrome associated with:
  - Fever
  - Rash
  - Headache
  - Joint pain
  - Conjunctivitis (red eyes)
  - Muscle pain

Zika Virus: signs and symptoms

- “Rash”
  - “maculopapular”
    - most common on trunk and extremities
    - can be on face and neck
    - not pruritic
    - lasts 2-14 days
    - 91.3% of those with sx get rash
  - Can also worsen psoriasis

Zika Virus: areas at risk

- Africa:
  - Angola, Benin, Botswana, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo-Kinshasa, Dem Rep of Congo, Djibouti, Egypt, Eritrea, Ethiopia, France, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Democratic Republic of Congo, Kenya, Liberia, Malawi, Mali, Mauritania, Mauritius, Madagascar, Mozambique, Namibia, Niger, Nigeria, Reunion, Rwanda, Senegal, Sierra Leone, South Sudan, Sudan, Tanzania, Togo, Uganda

- Asia:
  - Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Laos, Malaysia, Maldives, Myanmar, Nepal, Hong Kong Special Administrative Region, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam

- The Caribbean:
  - Anguilla, Antigua and Barbuda, Aruba, The Bahamas, Barbados, Belize, British Virgin Islands, Cuba, Dominica, Grenada, Guadeloupe, Grenada, Guiana, Haiti, Jamaica, Martinique, Montserrat, Netherlands Antilles, Turks and Caicos Islands, St. Lucia, St. Vincent and the Grenadines (from 2016), St. Kitts and Nevis, St. Eustatius

- Central America:
  - Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama

- North America:
  - Mexico

- The Pacific Islands:
  - Fiji, Marshall Islands, Palau, New Caledonia, Samoa, Solomon Islands, Tonga

- South America:
  - Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela

- In US: yellow zones around Miami-Dade, FL (lifted June 2, 2017) and Brownsville, TX (lifted Aug 29, 2017)

Zika Virus: prevention

- Don’t travel to endemic areas
- Mosquito protection if live in or travel to endemic areas
- Women: advised not to conceive for 2 months after infection/exposure
- Men: advised not to impregnate woman for at least 6 months after infection/exposure
Viral infections in Pregnancy: Summary

- Varicella – preventable if pt vaccinate prior to pregnancy; zoster not concerning
- HSV – treatable; pt should be aware prior to delivery
- Parvovirus – once skin lesions, not contagious but need OB
- Pityriasis rosea – rule out syphilis; not enough data but likely not big concern
- Zika - need travel hx