

Rubella (German Measles)

Pathophysiology

1. Infection by Togavirus: Rubella virus (ssRNA)
 - Spread through aerosolized droplets of infected pts.
 - Invades nasopharynx epithelium -> hematogenous spread
 - Replicates in RES -> secondary viremia (6-20d s/p infection)
 - Found in urine, CSF, lymph nodes, breast milk, blood, nasopharyngeal secretions, feces
 - Peak viremia -> rash
 - Virus shed 3-8d s/p infection -> 6-14d after rash onset (contagious)
 - Intrauterine infection:
 - Crosses placenta
 - Tissue necrosis from vasculitis, direct viral damage of tissue, chromosomal damage, reduced mitotic activity
 - Birth defects if infection during organogenesis (1st trimester)
2. Epidemiology
 - 50% of infected pts. asymptomatic
 - Up to 20% of US population susceptible
 - Outbreaks in colleges, military barracks, prisons
 - Usually pts. w/o immunizations: immigrants
 - 62% of US pts. >20yo
3. Morbidity/ mortality
 - Teratogenic (crosses placenta): birth defects, stillbirths, IUGR (1st trimester)
 - Part of ToRCH
 - Toxoplasmosis, Syphilis, Rubella, Cytomegalovirus, Herpes Simplex Virus
 - Encephalitis usually resolves w/o sequelae
 - Arthritis, thrombocytopenia usually resolve w/in days-mos

Diagnostics

1. Symptoms

- Pt. may be asymptomatic
- Hx of exposure:
 - 14-21d incubation period
- Prodrome (1-5d prior to rash):
 - Unusual in young children
 - Eye pain w/lateral, upward movement
 - HA, myalgias, chills, sore throat, anorexia, N/V
- Rash: pruritic w/adults
- Sx of Meningoencephalitis (rare): lethargy, MS changes, irritability
 - 2-4d -1wk s/p rash onset

2. Physical exam

- Maculopapular pink colored rash
 - Face/neck -> trunk, extremities (w/in 24hrs)
 - Fades face/neck (48hrs) -> trunk, extremities (w/in 72hrs): "3 day Measles"
 - Large areas of flushing w/in 24 hrs

- Fever (up to 38.5°C)
- Lymphadenopathy:
 - Tender (retroauricular, posterior cervical and postoccipital)
 - Appears at least 24 hrs prior to rash
- Mild splenomegaly
- Forchheimer spots (20%)
- Meningoencephalitis signs:
 - Meningeal signs
 - Hypotonia
 - Full anterior fontanelle
- Congenital effects
 - Sensorineural (uni/bilateral) hearing loss/deafness
 - Cataracts, glaucoma, pigmented retinopathy (salt-pepper macular changes)
 - PDA, VSD, pulmonary artery stenosis, MR, hypotonia
 - Jaundice, thyroid abnl, diabetes, anemia, thrombocytopenic purpura
 - **"Blueberry muffin spots"**: abnormal dermal erythropoiesis

3. Diagnostic testing

- Labs
 - CBC: r/o leukopenia, thrombocytopenia (rare)
 - Serologic testing: ELISA, immunofluorescent assay
 - Viral culture (PCR): congenital disease (urine, CSF, nasopharynx)
 - May be abnl in immune compromised, recently vaccinated
 - LP: nl glucose, nl/elevated protein, 20-100WBC/mm³ (lymphocytosis)
 - beta hCG: in female pts. (r/o pregnancy if indicated)
- Other diagnostic testing
 - ECHO (congenital): r/o cardiac defects

4. Diagnostic imaging

- CXR (congenital): r/o pneumonitis, CHF if indicated
- Long bone XR (congenital): metaphyseal radiolucencies
- Head MRI (congenital): white matter changes, cortical atrophy (Panencephalitis)

Differential Diagnosis

1. Measles (Rubeola)
2. Roseola Infantum
3. Scarlet Fever
4. CMV / EBV infection
5. Erythema Infectiosum (Fifth Disease)
6. Contact Dermatitis
7. Syphilis
8. Kawasaki Disease
9. Other viral exanthems (enteroviruses)
10. Drug eruptions

Acute Treatment

1. Supportive care
2. Pruritis: Antihistamines (Diphenhydramine), oatmeal baths
3. Arthritis: rest, NSAIDs (not corticosteroids)

Disposition

1. Admit
 - Exposed/affected delivered infants, pts. w/serious complications
 - Pediatrics, Cardiology, Ophthalmology consults as indicated
2. Discharge
 - Stable pts. w/appropriate follow up

Further Management

1. Contact isolation
 - Congenitally acquired babies infectious for up to 1yr
 - Droplet precautions x7d; contact precautions x1yr
2. Further Diagnostic Testing
 - CBC
 - Lytes, BUN/Cr
 - Viral culture: nasopharyngeal swab/urine
 - Usually for epidemiologic tracking
3. Medications
 - IV fluids if needed
 - IVIG: severe thrombocytopenia (no corticosteroids)
4. Procedures
 - Vision/hearing testing for congenitally exposed
 - Phototherapy: jaundice
 - Surgical repair of cardiac abnl, cataracts, glaucoma

Follow Up Care

1. Follow up w/PCP as appropriate
 - Congenital disease pts.: frequently
 - Hearing/vision, developmental screening
 - Monitor for thyroid disease, DM
2. Prevention
 - Exclude children from school until 7d s/p rash
 - MMR vaccine: life-long immunity
 - Children: 12-15mos and 4-6yrs (no later than 11yo)
 - All at risk pts. w/o immunity (military, healthcare workers, non-pregnant women, HIV)
 - Avoid in pts. on corticosteroids (at least 1mo s/p cessation)
 - Allergic reaction to eggs, urticaria not contraindication
3. Pregnancy considerations
 - Avoid pregnancy w/in 3mos of receiving vaccine
 - Avoid pts. w/rubella, congenital disease w/in 1yr of life
 - Test for immunity at onset of pregnancy
 - Consider pregnancy termination
 - IVIG: if termination not option

References

1. Haas DM, et al. Rubella, rubeola, and mumps in pregnant women. *Obstet Gynecol* August 2005;106:295-300.
2. Nelson Textbook of Pediatrics, 17th ed., Copyright © 2004

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