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Measles (Rubeola)

Pathophysiology

1. Infection spread by respiratory droplets
   - Enters respiratory epithelium (CD46) -> regional lymph nodes/replicates
     - Incubation period: 7-12d
     - Communicable just before prodrome till 4d after rash appears
   - Viremia -> endothelial cell infection (Koplik spots) -> epithelial cell infection (rash)
   - Infects monocytes causing immunosuppression
     - Increased risks of severe bacterial pneumonia, Otitis Media
   - Life-long immunity s/p infection
   - See Vaccination schedules
     - Vaccination effectiveness in <1yo may be reduced by maternal antibodies
2. Epidemiology
   - 50 million cases worldwide/yr; 1 million deaths/yr
     - Returning in pockets of underimmunization
     - Up to 30% of adults may be at risk
   - Infectivity rate of 76%
3. Morbidity/mortality
   - Dehydration (diarrhea), pneumonia, croup, hepatitis, vit A deficiency, myocarditis, blindness
   - Acute encephalitis (0.1%, permanent brain damage, 10% mortality)
   - Delayed encephalitis in pts. w/lymphoid malignancies (usually fatal)
   - **Subacute sclerosing panencephalitis (SSPE):** rare degenerative, chronic disease
     - Behavioral, MS changes, seizures
     - Incubation period: 10.8 yrs (mean)

Diagnostics

1. **Symptoms**
   - Prodrome: cough, coryza, conjunctivitis
     - Fever (>101°F, may last 7-10d), photophobia, malaise
     - Increase in severity until 3-4d prior to rash
   - Sx resolution in 7-10d
2. **Physical exam**
   - **Koplik spots:** blue/white macules w/red base on premolar buccal mucosa
     - Pathognomonic; sloughs as rash appears
     - Last: 2-4d; appear: 24-48hrs prior to rash
   - Erythematous maculopapular rash: face/ears -> trunk/extremities (w/in 24-36hrs)
     - Maximum at 3d; includes palms/soles
     - Fades to yellow-brown lesions in 5-10d (head downward)
     - May desquamate s/p 1wk; spares palms/soles
     - Severity of disease is directly related to extent and confluence of rash
   - Generalized LAD, hepatomegaly, appendicitis
   - Lymphadenopathy at angle to jaw and posterior cervical region

3. **Diagnostic testing**
    - Labs
        - LFTs: if hepatitis suspected
        - LP: r/o meningitis if indicated
        - IgM up to first 72 hours of rash appearance
            - Repeat in 72 hours if still strong suspicion
            - Consider using CDC or state lab
    - Diagnostic imaging
        - CXR: r/o pneumonia

Differential Diagnoses

1. RMSF
2. Toxic shock
3. Kawasaki
4. Rubella
5. Roseola
6. Fifth Disease
7. Meningococcemia
8. Drug eruptions

Acute Treatment

1. Supportive care
    - Maintain adequate hydration
    - Consider IgG if pregnant, <1yo, immunocompromised
        - Consult infectious disease or gynecology
2. Vitamin A supplements
3. Measles vaccination
4. Empiric antibiotics if secondary infection only
5. Ribavirin (experimental): severe cases, immunocompromised, SSPE
6. Report all/suspected cases, adverse vaccine reactions to CDC/local health department

Disposition

1. Admit
    - Pts. w/severe disease, secondary complications

Further Management

1. Treat secondary complications as indicated
2. Airborne precautions
    - Up to 4d after rash starts in normal pts.
    - Entire disease for immunocompromised pts.
3. Diagnostic Testing
    - Contact CDC/local health department if IgM assay is positive

Follow Up Care

1. Vaccine prophylaxis/IgG in exposed susceptible/immunocompromised
    - Give w/in 6d of exposure
    - See Acute Treatment
2. Healthcare workers should not work from 5-21d after exposure

3. Follow up with PCP as appropriate
4. Prevention
    - Measles immunization as part of MMR series
    - Refer to detailed MMR immunization information for details

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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