Rubella

General Considerations

Rubella (**German measles** or **3 day measles**) is a mild, often exanthematous disease of infants and children that is typically more severe and associated with more complications in adults. Its major clinical significance is transplacental infection and fetal damage as part of the **congenital rubella syndrome (CRS).**If it were not teratogenic, rubella would be of little clinical importance. Clinical diagnosis is difficult in some cases because of its variable expression. In one study, over 80% of infections were subclinical.. Rubella is transmitted by aerosolized respiratory secretions. The period of highest communicability is from 5 days before to 6 days after the appearance of the rash. The most important risk factor for severe congenital defects is the stage of gestation at the time of infection. Maternal infection during the 1st 8 wk of gestation results in the most severe and widespread defects. The risk for congenital defects has been estimated at 90% for maternal infection before 11 wk of gestation.

ETIOLOGY

It is a single-stranded RNA virus; humans are the only known host.

CLINICAL MANIFESTATIONS

1. **Postnatal infection**

An incubation period of ***14-21 days***, a prodrome consisting of low-grade fever, sore throat, red eyes with or without eye pain, headache, malaise anorexia, and lymphadenopathy begins. Suboccipital, postauricular, and anterior cervical lymph nodes are most prominent. In children, the first manifestation of rubella is usually the rash. It begins on the face and neck as small, irregular pink macules that coalesce, and it spreads centrifugally to involve the torso and extremities, where it

tends to occur as discrete macules. About the time of onset of the rash,examination of the oropharynx may reveal tiny, rose-colored lesions (**Forchheimer spots**) or petechial hemorrhages on the soft palate. The rash fades from the face as it extends to the rest of the body. The duration of the rash is generally ***3 days***, and it usually resolves without desquamation. Subclinical infections are common, and 25-40% of children may not have a rash.

2. Congenital infection—More than 80% of women infected in the first 4 months of gestation are delivered of affected infants; congenital disease occurs in less than 5% of women infected later in pregnancy. Later infections can result in isolated defects, such as deafness. The main manifestations are as follows:

a. **Growth retardation**. Between 50% and 85% of infants are small at birth and remain so.
b. **Cardiac anomalies**. Pulmonary artery stenosis, patent ductus arteriosus, ventricular septal defect.
c. **Ocular anomalies**. Cataracts, microphthalmia, glaucoma, retinitis.
d. **Deafness.**
e. **Cerebral disorders**. Chronic encephalitis.
f. **Hematologic disorders**. Thrombocytopenia, Erythropoiesis in dermis (extramedullary hematopoiesis) or purpura ("blueberry muffin" rash), lymphopenia.
g. **Others**. Hepatitis, osteomyelitis, immune disorders, malabsorption, diabetes

DIAGNOSES& LABORATORY FINDINGS

Leukopenia, neutropenia, and mild thrombocytopenia have been described during postnatal rubella.

Congenital infection is associated with low platelet counts, abnormal liver function tests, hemolytic anemia, pleocytosis, and very high rubella IgM antibody titers. Total serum IgM is elevated(**Rubella IgM enzyme immunosorbent assay** is the most common diagnostic test), and IgA and IgG levels may be depressed

DIFFERENTIAL DIAGNOSES

Adenoviruses, parvovirus B19 (erythema infectiosum), Epstein-Barr virus, enteroviruses, and *Mycoplasma pneumonia*.

COMPLICATIONS

Complications following postnatal infection with rubella are infrequent and generally not life-threatening

1. Postinfectious **thrombocytopenia** occurs more frequently among children and in girls. It manifests about 2 wk following the onset of the rash as petechiae, epistaxis, gastrointestinal bleeding, and hematuria. It is usually self-limited.

2. **Arthritis** following rubella occurs more commonly among adults, especially women. It begins within 1 wk of onset of the exanthem and classically involves the small joints of the hands. It also is self-limited

3. **Encephalitis** is the most serious complication of postnatal rubella.
It occurs in 2 forms***: a postinfectious syndrome*** following acute rubella
Postinfectious encephalitis is uncommon. It appears within 7 days after onset of the rash, consisting of headache, seizures, confusion, coma, focal neurologic signs, and ataxia. Most patients recover completely, but mortality rates of 20%.
Progressive rubella panencephalitis (PRP) is an extremely rare complication of either acquired rubella or CRS. It has an onset and course similar to those of the subacute sclerosing panencephalitis associated with measles . Death occurs 2-5 yr after onset.
Other neurologic syndromes rarely reported with rubella include Guillain-Barré syndrome and peripheral neuritis. Myocarditis is a rare complication.

TREATMENT

There is **no** specific Rx available for either acquired rubella or CRS.
Postnatal rubella is generally a mild illness that requires no care beyond **antipyretics and analgesics**. IVIG or corticosteroids can be considered for severe, non-remitting thrombocytopenia.

Management of children with **CRS is more complex** and requires pediatric, cardiac, audiologic, ophthalmologic, and neurologic evaluation and follow-up because many manifestations may not be readily apparent initially or may worsen with time. **Hearing screening** is of special importance, because early intervention may improve outcomes in children with hearing problems caused by CRS.

PROGNOSIS

Postnatal infection with rubella has an **excellent** prognosis. Long- term outcomes of CRS are **less favorable** and somewhat variable. **Reinfection** with wild virus occurs in both individuals who were previously infected or vaccinated.

PREVENTION

Transmission of rubella is in same manner as that of measles.
Patients with postnatal infection should be **isolated** from susceptible individuals for **1 wk after onset of the rash**. Children with **CRS** may excrete the virus in respiratory secretions for **up to 1 yr** of age, so contact precautions should be maintained for them until then, unless repeated cultures of urine and pharyngeal secretions have negative results.
Pregnant women exposed to rubella should be thoroughly investigated by serology to exclude infection with rubella; if the results are positive then counseling should be provided about **termination of pregnancy** or **immunoglobulin** administration (but does not guarantee prevention of fetal infection).
Rubella vaccination is given as MMR or MMRV in a 2 dose regimen at 12-15 mo then at 4-6 yr of age. Post-exposure prophylaxis of vaccine administered within **3 days** of exposure. Vaccination of women in the child-bearing age is highly effective in prevention of CRS.