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Rubella

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Rubella, also known as German measles, is a relatively benign disease exclusive to humans when contracted postnatally. Prior to immunization efforts, rubella epidemics occurred about every 7 years. The classic presentation involves prodromal symptoms, followed by lymphadenopathy and the brief appearance of an exanthem. However, when a mother becomes infected during the first trimester of pregnancy, the resulting viremia has its most devastating effect on the developing fetus and can result in congenital rubella syndrome (CRS).

Peak infection rates of rubella tend to occur in late winter and early spring. Disease transmission is by droplet inhalation from the respiratory tract of an infected host. Cells in the nasopharynx become infected, followed by viral dissemination into the lymphatic system and eventually into multiple organs. The incubation period for postnatally acquired infection is 2 to 3 weeks. The period of contagion is from several days before to 2 weeks after the onset of the rash.

Postnatal symptoms that do occur generally are mild. Postauricular, cervical, and suboccipital lymphadenopathy, along with low-grade fever, develop 1 to 5 days before the exanthem. The latter begins on the face as an erythematous maculopapular rash and spreads over the body in a centrifugal pattern during the first 24 hours. By the third day, the rash begins to clear. Adolescents and adults, more so than younger children, tend to experience prodromal eye pain, headache, sore throat, anorexia, nausea, fever, and lethargy. Up to 50% of individuals who have documented postnatally acquired infection present with no obvious clinical manifestations.

Polyarthritis and polyarthralgia, occurring in a large percentage of postpubertal females, are the most common complications of postnatal rubella infection. For most patients, this symptom resolves within a few days, but it may last up to 1 month. Other complications include encephalitis, thrombocytopenic purpura, and in rare cases, death attributable to hemorrhagic complications.

Maternal rubella infection occurring more than several weeks prior to conception presents no risk to the developing fetus. When maternal infection occurs in the first 12 weeks of pregnancy, especially during the first 8 weeks, more than 80% of fetuses develop significant congenital defects. During those 8 weeks, there is a 20% risk of spontaneous abortion. Major defects in children born with CRS include sensorineural hearing loss, heart disease, cataracts, and psychomotor retardation. Other organ systems also can be affected.

Meningoencephalitis, thrombocytopenia, hepatosplenomegaly, and radiolucencies in the metaphyses of long bones can occur in the immediate neonatal period but tend to resolve spontaneously within a few weeks. Intrauterine growth restriction is a significant problem, resulting in low birthweight and failure to thrive in early childhood.

Because of persistent active infection, delayed manifestations of CRS may develop, including vascular effects, endocrinopathies, and progressive rubella panencephalitis. Nearly 20% of survivors may be shedding the virus at 1 year of age. Of those who develop hepatosplenomegaly and thrombocytopenia, 10% to 20% die within the first year.

Because postnatal primary rubella infection generally is a mild disease involving often fleeting signs and symptoms that can be confused easily with other viral diseases, specific diagnosis should be confirmed by specific serum immunoglobulin M (IgM) assay. Other approaches are isolation of the
virus from nasopharyngeal specimens on tissue culture or diagnostic testing using polymerase chain reaction.

When the question arises as to whether a pregnant female has rubella infection, testing should include an IgM antibody determination as well as an IgG antibody assay in paired sera collected 1 to 2 weeks apart. To discern whether a positive test for both indicates a primary infection or reinfection, avidity of rubella IgG antibody should be measured. Low avidity indicates primary infection; high avidity is consistent with reinfection.

The primary focus of controlling rubella disease should be prevention of CRS. Efforts should be directed toward maintaining elevated vaccine coverage rates in children and adolescents, providing adequate surveillance systems for rubella and CRS, and performing appropriate and timely interventions during outbreaks. Despite widespread vaccination, some women of childbearing age may be susceptible to rubella. Until the exanthem has cleared, susceptible individuals should be kept out of contact with anyone infected with rubella. In an effort to avert spread, it is the responsibility of health care personnel to report active cases to local public health authorities.

In 2005, the Centers for Disease Control and Prevention (CDC) declared that rubella had been eliminated from the United States. Since that time, the few cases that have been reported to the CDC have been attributed to immigrants from countries where rubella still is present.

Comment: Postnatally acquired rubella disease was described initially by two Germans, leading to the term “German measles.” Not until the early 1940s, when an Australian ophthalmologist noted the association with congenital cataracts, deafness, and cardiac disease, was CRS identified. Rubella is an example of a disease whose postnatal acquisition is of little consequence, but as Dr Drutz mentions, the acquisition by a pregnant woman could be devastating to the fetus. Initial immunization programs in the United States proposed universal immunization of children, but extension of these programs included adolescent and adult females in addition to a postpartum strategy for nonimmune women identified during pregnancy who could not be immunized. Further extension includes the two-dose vaccine as part of the measles-mumps-rubella (MMR) vaccine. Although active immunization programs in the United States have led to eradication of rubella, maintaining immunizations is important to the continued prevention of CRS. A recent concern has been parental anxiety about adverse effects from the MMR vaccine. Practitioners need to remain vigilant in recognizing both postnatal rubella and CRS because they still may occur in patients who have emigrated from countries where rubella has not been eradicated.

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