4.11 Rubella and Congenital Rubella Syndrome

Etiology

Rubella is caused by the rubella virus (family Togaviridae; genus *Rubivirus*).

Case Definitions

Rubella

Confirmed Case

Laboratory confirmation of infection in the absence of recent immunization with rubella-containing vaccine:

- isolation of rubella virus from an appropriate clinical specimen **OR**
- detection of rubella virus RNA **OR**
- seroconversion or significant rise (e.g. fourfold or greater) in rubella IgG titre by any standard serologic assay between acute and convalescent sera **OR**
- positive serologic test for rubella IgM antibody using a recommended assay in a person with an epidemiological link to a laboratory-confirmed case or a person who has recently traveled to an area of unknown rubella activity **OR**
- clinical illness[8] in a person with an epidemiological link to a laboratory-confirmed case

Probable Case

Clinical Illness

- in the absence of appropriate laboratory tests

OR

- in the absence of an epidemiological link to a laboratory-confirmed case

OR

- in a person who has recently travelled to an area of known rubella activity

Congenital Rubella Syndrome (CRS)

Confirmed Case

Live birth**:** two clinically compatible manifestations (any combination from Table 1, Columns A and B) with laboratory confirmation of infection:

- isolation of rubella virus from an appropriate clinical specimen **OR**
- detection of rubella virus RNA **OR**

[8] Clinical illness is characterized by fever and rash, and at least one of the following: arthralgia/arthritis, lymphadenopathy, conjunctivitis

- positive serologic test for IgM antibody in the absence of recent immunization with rubella-containing vaccine **OR**
- rubella IgG persisting for longer than would be expected (approximately six months after birth) from passive transfer of maternal antibody, or in the absence of recent immunization

Still Birth: two clinically compatible manifestations with isolation of rubella virus from appropriate clinical specimen

Probable Case

In the absence of appropriate laboratory tests, a case that has at least

- any two compatible manifestations listed in Table 1, column A

OR

- one manifestation listed in Table 1, column A, plus one listed in Table 1, column B

NOTE: The following cannot be classified as a CRS case:

- rubella antibody titre absent in the infant

OR

- rubella titre absent in the mother

OR

- rubella antibody titre declining in the infant consistent with the normal decline after birth of passively transferred maternal antibody

Congenital Rubella Infection (CRI)

Confirmed Case

Laboratory confirmation of infection but with no clinically compatible manifestations:

- isolation of rubella virus from an appropriate clinical specimen

OR

- detection of rubella virus RNA

OR

- positive serologic test for rubella IgM antibody in the absence of recent immunization with rubella-containing vaccine

OR

- rubella IgG persisting for longer than would be expected (approximately six months after birth) from passive transfer of maternal antibody, or in the absence of recent immunization

Table 1. Congenital Rubella Syndrome: Clinically Compatible Manifestations.

Column A	Column B
1. Cataracts or congenital glaucoma (either one or both count as one) 2. Congenital heart defects 3. Sensorineural hearing loss 4. Pigmentary retinopathy	1. Purpura 2. Hepatosplenomegaly 3. Microencephaly 4. Micro ophthalmia 5. Mental retardation 6. Meningoencephalitis 7. Radiolucent bone disease 8. Developmental or late onset conditions such as diabetes & progressive panencephalitis & any other conditions possibly caused by rubella virus

Clinical Presentation

RUBELLA

Rubella is generally a mild febrile viral illness characterized by a mild rash in about 50% of cases. While children are usually asymptomatic adults have a low grade fever, headache, mild coryza, malaise and conjunctivitis may appear 1-5 days before the onset of rash. The most characteristic sign is lymphadenopathy and it can begin 5-10 days prior to the appearance of the rash and involves occipital, post auricular and posterior cervical nodes. Transient arthralgia and less often arthritis can occur in up to 50% of women and adolescents. The maculopapular rash last about 3-5 days, begins on the face and can spread to the chest arms and trunk. One in every 6000 cases develops encephalopathy.

CONGENITAL RUBELLA SYNDROME (CRS)

Fetal infections with rubella, especially in the first 20 weeks of pregnancy, may be associated with spontaneous abortion, intrauterine death and a variety of other problems collectively known as CRS.

Congenital rubella infection (CRI) occurs when the rubella virus is passed from an infected pregnant mother to her baby. Infants born with CRI have laboratory confirmation of infection but no visible defects. The virus may be shed in the infant's urine or nasopharyngeal secretions for a year or more. Infants infected at 20 weeks of pregnancy or beyond may still present later in life (sometimes several years later) with deafness, chorioretinopathy, developmental delay or other problems.

Moderate and severe cases of CRS are typically recognized at birth. In mild forms of the disease, however, the anomalies may not be obvious at birth but become apparent within the first year of life. The risk of infection producing damage to the fetus is as high as 90% if infection occurs in the first trimester, falling to 10–20% by the 16th week, and

becoming very low by the 20th week of pregnancy and beyond. Diabetes mellitus has been recognized as a frequent late manifestation of CRS.

Diagnosis

Information on appropriate laboratory specimens is available on public health laboratory website site www.publichealthlab.ca or call 709-777-6583.

- Laboratory personnel should be notified that rubella is suspected because specialized testing is required to detect the virus
- Recent immunization with rubella-containing vaccine can cause false positive results
- Rubella-specific IgG persisting for longer than would be expected (approximately six months following birth) from passive transfer of maternal antibody, or in the absence of recent immunization.

Epidemiology

Occurrence

In Canada, in 2000, there were 29 cases of rubella compared to 704 cases in 1991. In Newfoundland and Labrador (NL) there have been no cases of rubella since 1991.

Reservoir

Humans

Transmission

Transmission occurs through droplets from the respiratory secretions of an infected individual. Transplacental transmission from an infected mother to her fetus during pregnancy may result in CRS in the infant.

Incubation period

The incubation period is 14-17 days with a range of 14-21 days.

Communicability

Rubella is highly contagious for those who are non-immune. It can be transmitted one week before and for one week after the onset of the rash. Infants with CRI/CRS can shed the virus in their urine and nasopharyngeal secretions for a year or more.

Control Measures

Management of Cases

Investigations

- Confirm the diagnosis

- Determine the immunization history
- Identify the possible sources of infection e.g., recent history of travel (30 days prior to onset of symptoms), contact with others who have recently traveled or recent contact with a case of rubella, or recent immigration
- Determine the occupation and place of employment, if applicable
- Identify contacts. Determine if any contact with pregnant women

Congenital Rubella Syndrome (CRS)

- Determine the mother's immunization and antenatal serologic status
- Determine if the mother recalls being exposed to rubella status during the pregnancy

Treatment

- There is no specific treatment, treatment should be based on the symptoms of the patient

Immunization

If a case has not been immunized or if immunization status is uncertain they should be immunized according to the NL Immunization schedule:
http://www.health.gov.nl.ca/health/publichealth/cdc/immunizations.html

Exclusion

- In hospital, rubella cases must be placed on Droplet Precautions for seven days after the onset of the rash
- Rubella cases should be excluded from childcare, school or work for seven days after the onset of the rash
- Droplet and Contact Precautions are indicated for hospitalized children with proven or suspected congenital rubella until they are at least one year age, unless cultures of clinical specimens obtained one month apart after three months of age are negative for rubella virus
- Once discharged from hospital, only persons that are immune to rubella should have contact with and care for child with CRS

Management of Contacts

Contact tracing needs to begin immediately after identification of a case.

Definition

A susceptible contact is someone who has shared the same airspace during the infectious period.

Immunoprophylaxis

All contacts should be fully immunized against rubella. Although live-virus rubella vaccine administered after exposure has not been demonstrated to prevent illness, vaccine theoretically could prevent illness if administered within three days of exposure.

If a person has not been immunized or if immunization status is uncertain he/she should be immunized according to the Newfoundland and Labrador Immunization Manual schedule at web site:
http://www.health.gov.nl.ca/health/publichealth/cdc/immunizations.html

Exclusion

Exclusion of contacts from childcare, school or work is not indicated.

Management of Outbreaks

- An outbreak management team should be established to address infection prevention and control measures.

Education and Prevention Measures

In countries, such as Canada, immunization rates are high and rubella is seen very rarely.

- The most effective preventive measure against rubella is vaccination
  - In NL rubella vaccination is routinely given at 12 and 18 months of age
  - Vaccine is given as measles, mumps and rubella (MMR)
- Part of the pre-natal screen in Canada includes screening for immunity to rubella
  - Use every opportunity to review the rubella vaccination history with women of childbearing age
  - Immunize non-pregnant women of childbearing age who have no proof of immunity
  - Pregnant women found to be susceptible should be vaccinated with a rubella-containing vaccine in the immediate postpartum period, preferably in hospital prior to discharge
  - Advise rubella-susceptible pregnant women to avoid individuals with rubella and report any contacts with cases to their physician immediately
  - Women who are exposed to rubella during pregnancy should have serology done as soon as possible after the contact to determine susceptibility if this information is not readily available. Consult with MOH.
- Use every opportunity to immunize adolescents and women who immigrate from countries where rubella vaccine is not routinely used (e.g., the majority of Asian, African, and many Caribbean and South and Central American countries) or regions with poor vaccination coverage, as soon as possible
- Healthcare workers who have no documented immunity should be immunized with a single dose of rubella-containing vaccine
- All staff of daycare facilities shall ensure they are immunized against rubella
- Additional information on rubella is available at the Public Health Agency of Canada's web site
  http://www.phac-aspc.gc.ca/im/vpd-mev/rubella-eng.php

- A fact sheet is available at Department of Health and Community Services' web site http://www.health.gov.nl.ca/health/publichealth/cdc/infectioncontrol/Rubella%20May%202013.pdf

REPORTING REQUIREMENTS AND PROCEDURES

- The laboratory (hospital or public health laboratories) report case/s to the attending physician, the Chief Medical Officer of Health and the Medical Officers of Health (MOH)
- MOH office will notify, as required, local physicians, nurse practitioners, environmental health officers, community health nurses, communicable disease control nurses (CDCNs) and Infection control practitioners (ICP), in the particular region as required for follow-up and case investigation
- The CDCN in collaboration with the ICP (if necessary) will collect case details
- The CDCN will enter the case details into the electronic reporting system and utilize the Canadian Network of Public Health Intelligence (CNPHI) tool for alerts and/or outbreak summaries

Provincial Disease Control

- Reports the aggregate case data to Public Health Agency of Canada
- Provides an analysis of the case/s with reports in the Quarterly Communicable Disease Report (CDR), also posted on the Public Health website http://www.health.gov.nl.ca/health/publichealth/cdc/informationandsurveillance.html
- Coordinates the response if an outbreak occurs across RHAs

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