South Australian Perinatal Practice Guidelines

Rubella infection (maternal) in pregnancy

The 'Management of Perinatal Infections' guideline for Rubella in pregnancy by the Australasian Society for Infectious Diseases 2002, emendations 2006 has been used to inform this practice guideline.

Rubella

- Rubella, also called German measles, in children and adults is usually a mild infectious disease that is clinically difficult to diagnose due to transient clinical features that are also common to a number of other virus infections

Clinical features

- Rubella is asymptomatic in 25 to 50 % of cases. In some cases prodromal symptoms may be evident, such as:
  - Low grade fever
  - Transient erythematous rash
  - Lymphadenopathy involving post-auricular and sub-occipital nodes
  - Occasionally arthritis and arthralgia (commonly observed in women of child-bearing age)
  - Rarely neurological disorders and thrombocytopenia (NHMRC 2008)
  - The rash characteristically begins on the face and spreads to the trunk and extremities. It will usually resolve within three days in the same order in which it appeared (face first and then body) (Dontigny et al. 2008)

Route of transmission

- Respiratory airborne droplet transmission

Incubation period

- 14 to 23 days

Period of infectivity

- One week before until 4 days after the onset of the rash. (NHMRC 2008)

Infection precautions

- Additional precautions (single room with own toilet facilities, N95 mask, dedicated equipment) should be used when caring for a woman / baby suspected of infection with rubella

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SA Health

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Contact: South Australian Perinatal Practice Guidelines workgroup at: cywhs.perinatalprotocol@health.sa.gov.au

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Literature review

- Maternal rubella infection in the first 8 to 10 weeks of pregnancy results in fetal damage in up to 90 % of affected pregnancies, usually with multiple defects (NHMRC 2008)
- Following birth, these infants have a persistent infection, shedding virus for 6-12 months (Langford 2002)
- Abnormalities associated with congenital rubella syndrome include:
    - Mental handicap
    - Eye abnormalities (cataracts and retinopathy)
    - Sensorineural deafness
    - Cardiac abnormalities
    - Microcephaly
    - Intrauterine growth retardation, short stature
    - Inflammatory lesions of the brain, liver, lungs and bone marrow (Palasanthiran et al. 2002)
- The risk of fetal damage declines to 10 to 20 % by 16 weeks' gestation and has been rarely reported up to 20 weeks (NHMRC 2008)
- The prominent abnormality in the second trimester is sensorineural deafness (Langford 2002)
- Maternal reinfection in immune women carries a risk of fetal damage of less than 5 % (Palasanthiran et al. 2002)
- In recent years migrant and refugee communities especially from Asia and sub-Saharan Africa have been identified as having a much greater susceptibility to rubella than those born in Australia or developed countries (Francis et al. 2003)

Maternal Diagnosis

- Routine antenatal screening for rubella IgG is recommended for all pregnant women at their first visit
- All pregnant women who have contact with rubella or clinical features consistent with rubella – like illness should be screened for the presence of rising antibody titre and / or rubella specific IgM
- Serological confirmation is required before rubella can be diagnosed. Rubella is a notifiable disease
- The appropriate notification form for report of notifiable disease or related Death in South Australia may be downloaded and is available from URL: http://www.health.sa.gov.au/pehs/PDF-files/2008-case-reporting-form.pdf
- This form is not to be sent by email for reasons of confidentiality
- Notification should be made to the Communicable Disease Control Branch as soon as practicable and at least within 3 days of suspicion of diagnosis: Telephone (08) 8226 7177 or Facsimile (08) 8226 7187 (Department of Health 2008)

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Maternal management

Obtain maternal history

- History of previous vaccination and results of any previous screening test for rubella immunity (IgG antibody level > 10 IU / mL) is usually protective against infection
- Reimmunisation of some women with a low positive titre (IgG antibody level 10 – 20 IU / mL) may also be recommended e.g. women born in Australia or Western countries
- Document stage of pregnancy when contact with rubella occurred
- Identify duration of contact
- Living with a family member with rubella
- Workplace contact over how many hours / days
- Brief contact only
- Nature of contact – e.g. close personal contact as with kissing an infectious child
- Any clinical / laboratory evidence for rubella in the contact
- Stage of pregnancy when clinical rubella occurred / occurs in the mother
- Features of clinical rubella in the mother

IgG positive and IgM positive

- Indicates possible recent infection or reinfection.
- Repeat test to confirm (EIA or HAI on IgM fractions)
- Positive IgM confirms rubella infection
- Offer appropriate counselling (see below)

IgG negative and IgM negative

- Indicates susceptibility to rubella infection
- Repeat serology if less than 3 weeks since contact or less than 7 days since onset of illness
- If no seroconversion immunise after delivery
- If IgG seroconversion is confirmed, counsel as below

IgG negative and IgM positive

- Indicates possible recent infection
- Repeat serology
- If no IgG seroconversion occurs it may be a false positive IgM. Immunise after delivery
- If IgG seroconversion is confirmed, counsel as below

IgG positive and IgM negative

- Indicates past infection or immunisation
- Manage as in positive antenatal screening

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Counselling in case of seroconversion

- Counsel woman regarding relevant risk to fetus in relation to timing of maternal infection and options for management
- Termination of pregnancy should be offered if maternal infection in the first trimester
- Consider fetal testing if maternal infection in the second trimester

Postpartum management

- Vaccinate women found to be seronegative on antenatal screening before discharge with measles, mumps and rubella vaccine (i.e. rubella IgG < 10 IU / mL, or for women who were born in Australia or Western countries and whose antibody level is between 10 and 20 IU / mL) (NHMRC 2008)
- Inform the woman to avoid pregnancy for 28 days after vaccination
- There have been no cases of rubella effects from the live vaccine in the offspring
- Anti-D immunoglobulin does not interfere with the antibody response to vaccine. If anti-D immunoglobulin is also required, the two may be given at the same time in different sites with separate syringes, or at any time in relation to each other

Fetal diagnosis

- Rubella PCR, rubella culture and fetal IgM can be performed following chorionic villus sampling (CVS) / amniocentesis or cordocentesis
- PCR is not widely available and sensitivity is generally not well validated
- False negative fetal IgM is common until late in pregnancy

Amniocentesis

- This is ideally performed 3 weeks after symptoms or estimated timing of a subclinical infection
- Amniotic fluid is cultured for rubella virus. The cultures are maintained for 8 weeks before being considered negative. A negative culture does not completely exclude fetal infection. The likelihood of a positive culture falls rapidly after the first few weeks of culture
- Samples should be sent to Victorian Infectious Disease Reference Laboratory, 10 Wreckyn Street, North Melbourne. Telephone: 03 93422600 Fax: (03) 9342 2660

Fetal blood sampling

- Consult with a feto-maternal specialist for consideration of fetal blood sampling
- If fetal blood sampling performed at 21-23 weeks serum is tested for rubella-specific IgM antibodies and ethylene diamine tetra acetate (EDTA) anticoagulated blood is cultured for virus isolation
- Samples should be sent to IMVS for antibody studies and to VDRL, Fairfield for viral culture
- A negative IgM titre does not completely exclude fetal infection

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Chorionic villus sampling

- May be considered occasionally in the first trimester when couples are uncomfortable about termination of pregnancy based solely on the high risk of fetal infection and damage
- Associated with risk of contamination with maternal tissue giving false positive PCR
- Possible uses of tissue obtained include culture for rubella virus, immunoblotting and probing of extracted RNA with a rubella specific gene probe. The former technique is available at VDRL, Fairfield

Fetal management

- Ensure all clinicians caring for the newborn are rubella vaccinated and have specific antibodies detected
- Paediatrician at delivery
- Newborn assessment should include physical examination for evidence of congenital rubella syndrome (growth restricted, eye / cardiac abnormalities, rash, haematological abnormalities, pneumonitis, osteitis) (Palasanthiran et al. 2002)

Investigations

- Cord blood IgM
- Heel prick for IgM and culture
- Maternal blood for IgG, IgM
- PCR (urine and pharyngeal swab)
- Urine and pharyngeal swab culture
- Piece of placenta for culture
- Conjunctival swab
- Lens tissue (if available)
- Results can take several weeks

Infected infant (asymptomatic or symptomatic)

- Newborns who are IgM and PCR positive with IgG ≥ maternal IgG titre may or may not have clinical features of congenital rubella syndrome
- Use additional precautions (single room with own toilet facilities, N95 mask, dedicated equipment)
- Breastfeeding is not contraindicated
- Ensure ophthalmology, cardiac and hearing assessment following birth
- Serial follow up every 3 – 6 months for 12 months to detect any emerging abnormalities related to persisting infection (e.g. deafness, neurological deficiencies, epilepsy, cataracts, retinopathy, tooth defects and growth retardation)
- Infants may be an infectious risk for at least 12 months following birth to susceptible clinicians and pregnant contacts

Infant not infected

- If there are no clinical features of congenital rubella syndrome, (IgG ≤ maternal IgG titre, IgM negative and PCR negative); the newborn is probably not infected
- Reassure
- Confirm absence of infection with falling / absent IgG at or after 9 months of age

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Useful web sites

SA Department of Health: You've got what-Rubella. Available from URL: http://www.health.sa.gov.au/PEHS/Youve-got-what/ygw-rubella.pdf

Organization of Teratology Information Specialists (OTIS). Measles, Mumps, Rubella and the MMR Vaccine during Pregnancy. Available from URL: http://www.otispregnancy.org/pdf/mmr

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Abbreviations

NHMRC	National Health and Medical Research Council
et al	And others
IgG	Immunoglobulin G
IgM	Immunoglobulin M
e.g.	For example
URL	Uniform resource locator
PDF	Portable document format
IU	International units
mL	Millilitre(s)
EIA	Enzyme immunoassay
HAI	haemagglutination inhibition test
PCR	Polymerase chain reaction
CVS	chorionic villus sampling
EDTA	ethylene diamine tetra acetate
IMVS	Institute of Medical and Veterinary Science
VDRL	Venereal Disease Research Laboratory
RNA	Ribonucleic acid

Version control and change history

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Version	Date from	Date to	Amendment
1.0	29 Mar 09	30 Nov 09	Original version
2.0	30 Nov 09	21 Sept 10	Reviewed
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