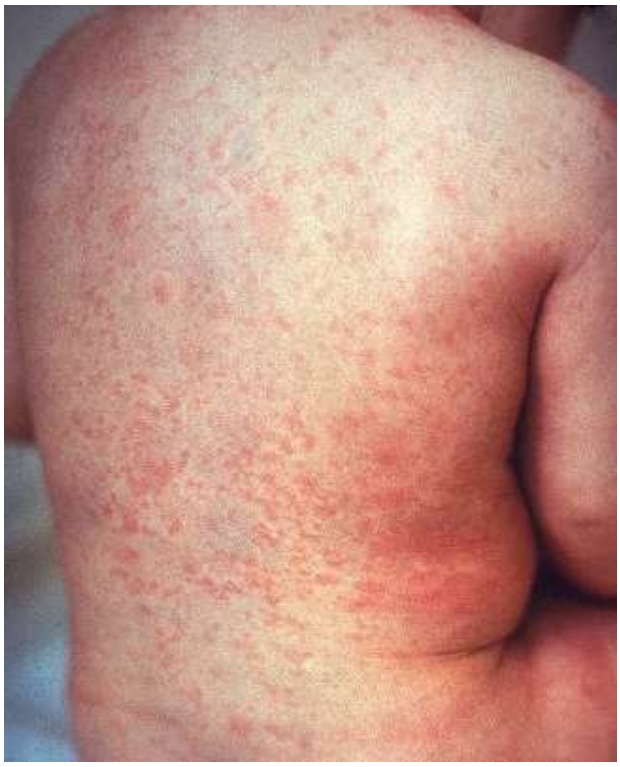
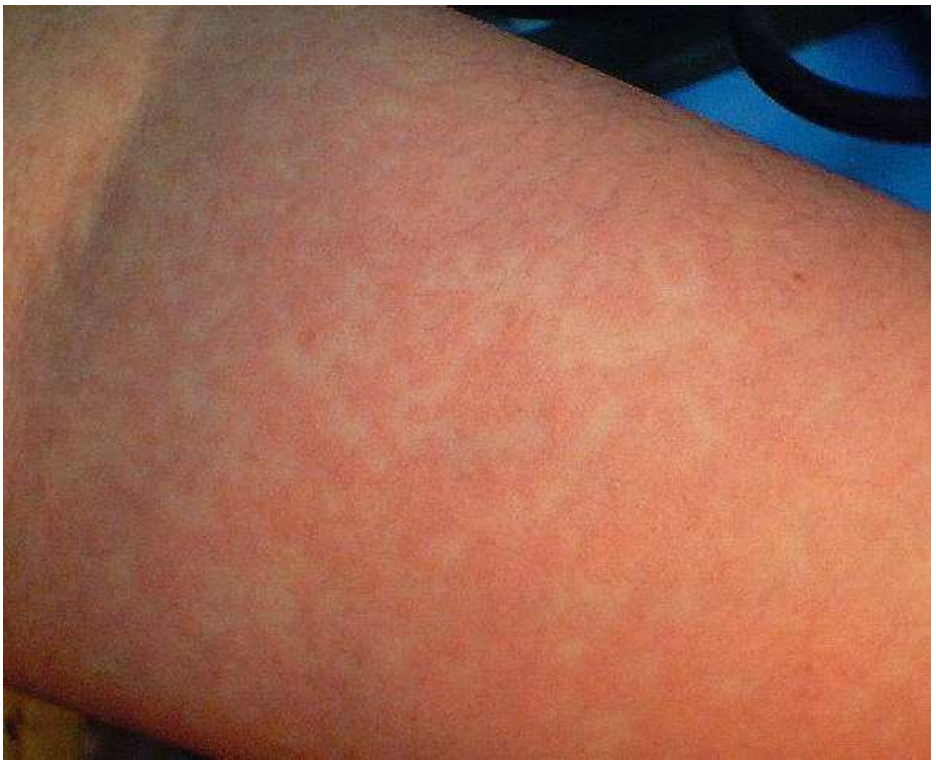
THE NORTHERN HOSPITAL

RUBELLA





Typical rubella rash, (Dermnet- NZ)

Introduction

Rubella occurs worldwide and is usually a mild febrile illness, with exanthem.

Its main significance lies in its potential to cause serious congenital abnormalities in pregnant women.

Australian vaccination programs have resulted in the **elimination of rubella from Australia**. In October 2018, The World Health Organization (WHO) declared Australia free of rubella.

Rubella, however remains a significant global health issue with an estimated 100,000 infants, born with **congenital rubella syndrome**, annually. [3]

Sporadic cases in Australia are still possible in unvaccinated immigrants or in unvaccinated Australian travellers who visit endemic regions.

Rubella vaccination represents one of the greatest triumphs of Twentieth century medical science.

History

Rubella was first described by the German physician and chemist, Friedrich Hoffmann (1660-1742) in 1740.

At the International Congress of Medicine in London rubella was formally recognised as a distinct disease entity, (i.e. it was distinct from both measles and scarlet fever).

It was the **Australian** Paediatric Ophthalmologist, **Sir Norman McAlister Gregg**, (1892 - 1966) who made the discovery that rubella suffered by pregnant women could result in birth defects, now known as the **congenital rubella syndrome**.

A vaccination in the form of a live attenuated virus, became available for rubella in 1969.

In the early 1970s, a triple vaccine containing attenuated measles, mumps and rubella viruses (the **MMR vaccine**) was developed.

In October 2018, The World Health Organization (WHO) declared Australia free of rubella.

Epidemiology

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Before the development of rubella vaccine in 1969 rubella was a **common** worldwide disease that occurred primarily among young children.

In October 2018 the WHO declared Rubella eliminated from Australia. This was achieved by high level vaccination rates.

Rubella became the third disease to be eliminated from the western hemisphere with vaccination after smallpox and polio.

However, rubella is still a common disease **worldwide** and globally an estimated 100,000 infants are still tragically born with **congenital rubella syndrome** annually. [3]

Sporadic cases are still possible in Australia, due to overseas exposure in unvaccinated individuals.

Pathology

Organism:

Rubella virus is an enveloped, positive-stranded, RNA virus

It belongs to the genus Rubivirus.in the Togaviridae family.

Transmission

- Rubella is transmitted by droplet spread or direct contact with infectious patients.
- Placental transmission.
- Infants with Congenital Rubella Syndrome shed the rubella virus in their nose, pharyngeal secretions and urine for months or even years.

Incubation Period

- The incubation period ranges from 14 - 21 days

Reservoir

- Humans are the only natural reservoir.

Period of Communicability

- Rubella is communicable approximately one week before and for at least four days after the onset of the rash.
- Congenital rubella syndrome infants may shed the virus for months or longer after birth.

Susceptibility and Resistance

- Immunity after natural disease is usually life long.
- Immunity after vaccination is long term and usually lifelong, although reinfection of vaccinees has been observed, including asymptomatic reinfection.
- Passive maternal immunity is acquired transplacentally.
    - ♥ Infants born to immune mothers are ordinarily protected for 6 - 9 months depending on the amount of maternal antibodies transferred.

Clinical Features

Many cases are **subclinical**, around 25 - 50%.

Clinical illness is usually mild.

Note that clinical diagnosis of rubella is unreliable as symptoms are often fleeting and non-specific.

"Typical" cases show:

1. Non-specific constitutional symptoms:

Children usually experience few or no constitutional symptoms

Adults may experience a 1 - 5 day prodrome of:

- Low-grade fever
- Headache
- Lethargy/ malaise

2. Mild upper respiratory tract symptoms:

- Mild coryza
- Otitis media
- Mild conjunctivitis.

3. Lymphadenopathy:

- Lymphadenopathy is common
- It precedes the rash by 5 - 10 days
- It lasts around 5 - 8 days
- It is *typically* seen at:
    - ♥ Post-auricular nodes
    - ♥ Occipital nodes
    - ♥ Posterior cervical nodes
- Lymphadenopathy may also be generalized.

4. Rash:

- This occurs in around 50% - 80% of infected people.
- Generalized "fine" erythematous maculopapular.

  Tends to be discrete or "punctate" (as opposed to a more confluent appearance as in measles) and is non-vesicular.

  Note however that the rash is very non specific and is not diagnostic of rubella.

- The rash usually starts on the face, then becomes generalized within 24 hours.
- It lasts a median of 3 days
- As rash passes, affected skin may shed in flakes

Complications

These include:

1. **Pregnancy related**:

   The most serious complication is infection in pregnant women

   This may result in:

   - Miscarriage
   - Stillbirth
   - **Congenital Rubella Syndrome, (especially with infection in the first trimester)**:

     ♥ Congenital rubella syndrome occurs in less than 25% of infants born to women who acquire rubella during the **first trimester** of pregnancy.

     ♥ The risk of a single congenital defect falls to approximately 10–20% by the 16th week of pregnancy.

     ♥ Defects are rare when the maternal infection occurs **after the 20th week** of gestation.

     Babies born with congenital rubella syndrome may show:

     ♥ Cerebral palsy/ intellectual disability.

     ♥ Deafness

     ♥ Blindness / cataracts

     ♥ Congenital heart disease, (including VSDs and patent ductus arteriosus)

Uncommonly:

2. Arthralgia and less commonly arthritis, particularly among adult females.

Rarely:

3. Encephalitis

Investigations

Blood tests:

1. FBE
    - Leukopenia
    - Thrombocytopenia (a rare complication)
2. U&E/ glucose
3. LFTs

Making the Diagnosis:

A "history" of rubella cannot be accepted without **serological evidence** of previous infection.

Clinical diagnosis should be confirmed by one of:

1. Serology:
    - **Demonstration of rubella-specific IgM antibody, except following rubella immunisation.**
    - A fourfold or greater rise in rubella antibody titre between acute and convalescent-phase sera obtained at least two weeks apart
2. PCR Testing:

    Can be from
    - Throat (best source)
    - Nasal swabs
    - Urine
3. Isolation of rubella virus from a clinical specimen.

Rubella can be very difficult to diagnose on purely clinical grounds, therefore consider also testing for other similar exanthems such as measles and human parvovirus (i.e Erythema infectiosum or slapped cheek disease).

Management

Prevention:

Isolation:

Patients with rubella should avoid contact with other people, particularly pregnant women, while infectious.

Vaccination:

Rubella vaccine is given as MMR, (measles, mumps and rubella).

MMR vaccine is recommended for all infants at the age of 12 and 18 months.and is given to *both males and females.*

As the rubella vaccine is a live attenuated vaccine it should not be given in pregnancy or those who are immunocompromised. **Interestingly however, inadvertent rubella vaccination during pregnancy has not, to date, been associated with any congenital rubella syndrome-like defects**. [1]

One dose of MMR vaccine is about 97% effective at preventing rubella if exposed to the virus. [3]

Because vaccination is not 100 % effective in inducing life-long immunity to rubella ascertaining rubella immunity is a routine part of antenatal screening regardless of previous vaccination status.

Women should be advised not to become pregnant until at least 28 days after vaccination.

For full vaccination details see, The Australian Immunization Handbook.

Treatment:

1. There is no *specific* treatment for rubella. Treatment is therefore supportive.

2. Normal human immunoglobulin (NHIG): [2]

    - Any woman of child bearing age who has had contact with a case of rubella or a suspected case of rubella, should be tested for antibody levels, irrespective of a past history of clinical rubella, or vaccination

      Using normal human immunoglobulin (NHIG) as post-exposure prophylaxis in non-immune pregnant contacts may **marginally** reduce the risk of rubella infection to the fetus.

      It may also reduce the likelihood of clinical symptoms in the mother.

In such cases, 20 mL of NHIG given intramuscularly within **72 hours of rubella exposure** might reduce, **but not eliminate**, the risk of rubella.

Serological follow-up of NHIG recipients is essential, and should continue for up to 2 months.

Notification:

Rubella and congenital rubella syndrome are routine notifiable conditions and must be notified by medical practitioners and pathology services in writing within 5 days of diagnosis.

This is a Victorian statutory requirement.

School exclusion:

Should be excluded until fully recovered or at least four days after the onset of the rash.

Adults should not go to work for the same period of time.

References

1. Rubella in "The Blue Book" Website, 31 August 2018

2. The Australian Immunization Handbook, 10th ed. website, Accessed November 2018.

3. Rubella in CDC Website, Accessed November 2018.

Dr J. Hayes
Reviewed November 2018.