

# Rubella

Rubella or rubeola (rubella or German measles) is a viral infectious exanthema disease . It is caused by the rubella virus, which is mainly transmitted by droplets. It enters the body through the mucous membrane of the nasopharynx and causes a disease with a usually mild course. When a pregnant woman is infected, the virus spreads through the placenta to the fetus and causes a severe syndrome of congenital rubella, characterized in particular by severe impairment of vision, hearing and the development of congenital heart defects.

Caution! In **English** *the term rubeola* means **measles** (also measles, *morbilli*).

## Rubella virus

- genus *Rubivirus*, family *Matonaviridae* (formerly family *Togaviridae*);
- single-stranded RNA virus;
- the host is only human.

## Epidemiology

The reported occurrence of rubella in the Czech Republic in the years 2005–2009 is 4–14 cases per year, i.e. 0.1 patients per 100 000 population per year.<sup>[1]</sup> **The source of infection is man**, with clinically manifest and clinically silent forms of rubella, from the end of the incubation period to the 7th day after the appearance of the rash.<sup>[2]</sup> A child with congenital rubella can also be a source of infection - it sheds the virus many months to years after birth. <sup>[2]</sup>

## Clinical Manifestations

The incubation period of the disease is **15-20 days**, with an average of 17 days.<sup>[3]</sup> The infection is spread by ``droplet infection or ``transplacentally. The disease manifests itself as a **maculopapular non-confluent rash** that starts on the *face* and spreads from there to the whole body, being less pronounced on the limbs. On the mucous membrane of the palate, enanthema to small petechiae, the so-called *Forscheimer's spots*, may be present. The rash is accompanied by **swelling of the suboccipital** and **retroauricular lymph nodes**<sup>[3]</sup>



Exanthema in rubella

Maculopapular exanthema in rubella

## Infection in pregnancy

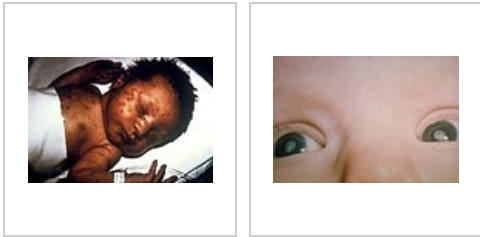
Infection of the mother in the first **4 months** of pregnancy causes miscarriage or the development of developmental defects of the fetus. The risk of damage to the fetus decreases with the length of pregnancy. The fetus is most at risk if the mother has rubella in the first trimester.<sup>[2]</sup>

## Gregg syndrome (congenital rubella syndrome)

'Congenitally acquired rubella is manifested by the emergence of the so-called *Gregg's syndrome*:

- *deafness*;
- *congenital heart defects*;
- *eye disorder* (typically cataract);
- often also *impairment CNS*;
- *dental anomaly*;
- on the skin *purpura* or *petechia* as a result of thrombocytopenia;
- sometimes present *icterus* caused by hepatitis.<sup>[4]</sup>
- late consequences can also be autoimmune diabetes mellitus, polyglandular syndrome or rare progressive rubella panencephalitis (PRP).<sup>[2]</sup>

If a pregnant woman is exposed to infection in the **first trimester** and does not have protective antibodies, it is recommended to repeat the serological examination in 2-3 weeks and recommend a genetic consultation if antibodies develop.<sup>[4]</sup> Risk of disability of the fetus is important in this situation, as part of the genetic consultation it is thus possible to offer the pregnant woman artificial termination of pregnancy.



Congenital rubella: blueberry muffin skin lesions

Congenital Rubella: Cataract

## Complications

Possible complications of rubella include: arthritis affecting rather small joints more often in women,<sup>[2]</sup> encephalitis, thrombocytopenia and myocarditis.

## Diagnostics

- **clinical** (exanthema, lymphadenopathy, epidemiological history);<sup>[2]</sup>
- **serology**; ELISA
- '*direct evidence* of virus in *blood, urine* and *nasopharyngeal secretions*.<sup>[4]</sup>

Differential diagnosis of measles and rubella

CRITERION	Measles	Rubella
Incubation period	ø 10 days	ø 18 days
Temperature	febrile	subfebrile
Exanthem	raised, confluent, deep red	flat, non-confluent, pink (to purplish)
Sowing	behind the ears → nape of the neck → trunk and limbs	face → torso and limbs
Swollen nodes	submandibular	nuchal
Typical symptom	<b>Koplik's spots'</b> (gray macules; buccal mucosa in stool area)	<b>Forschheimer spots</b> (enanthema/petechiae on the palate)
Fetal damage	not	Yes

## Treatment

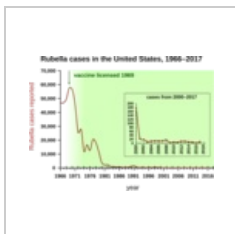
Treatment is only symptomatic, i.e. based on alleviating difficulties. There is no causal treatment. It is important to isolate the sick from the susceptible population.<sup>[2]</sup>

## Vaccination

As part of regular vaccination, the **MMR vaccine**' is given, which contains ``weakened viruses *of measles, mumps and rubella* (**m**easles, **m**umps, **r**ubella). *The first dose is given after the child is fifteen months old. Re-vaccination is carried out **6 to 10 months'** after the basic vaccination has been carried out.* = *Vakcíny.net/year = 2009/revision\_date = 23/03/2009/cited = 20/07/2009/url = [http://www.vakciny.net/pravidelne\\_ockovani/MMR.htm](http://www.vakciny.net/pravidelne_ockovani/MMR.htm)}}* </ref>

## History window

Congenital rubella syndrome was first described by the Australian ophthalmologist Sir Norman McAlister Gregg in the early 1940s, when he related the increased incidence of congenital cataracts in children of mothers who had rubella during pregnancy. The rubella virus was isolated in the early 1960s. This discovery enabled the development of laboratory diagnostics of rubella. In the years 1963 - 1965, there was a rubella epidemic in Europe and subsequently in the USA, accompanied by a high incidence of congenital rubella syndrome. These devastating consequences of the rubella epidemic were the motivation for the development of a vaccine. As early as the late 1960s, a rubella vaccine (live, attenuated) was developed and registered, which subsequently became part of the MMR vaccine. Rubella vaccination was started in the US for young children, while in Britain it was for teenage girls. Neither strategy led to a sufficient reduction in the circulation of the virus in the population, so both countries proceeded to general vaccination of children and targeted vaccination of teenage girls and adult women.<sup>[5]</sup>



Development of the incidence of rubella in the US and the impact of vaccination.

## Source

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5. PLOTKIN, Stanley A.. The History of Rubella and Rubella Vaccination Leading to Elimination. *Clinical Infectious Diseases*. 2006, y. Supplement\_3, vol. 43, p. S164-S168, ISSN 1537-6591. DOI: 10.1086/505950 (<http://dx.doi.org/10.1086%2F505950>).

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