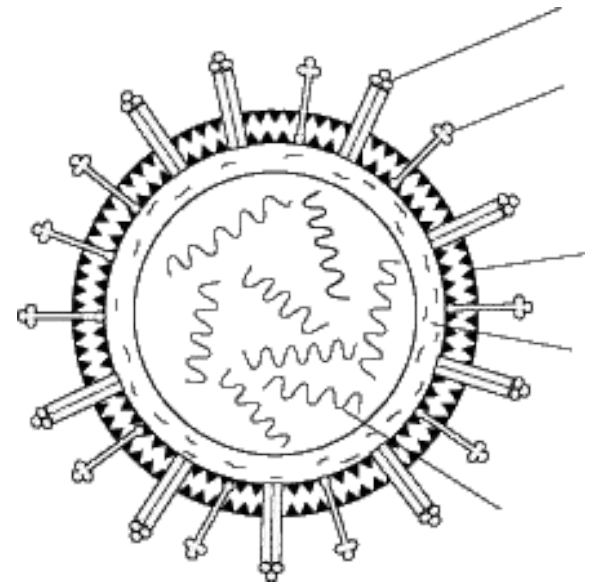


The diseases with the
exanthemas syndromes

**Measles (Morbilli), Rubella ,
Scarlet Fever**

Measles (Morbilli)

- The **pathogenic agent** causing measles is the paramyxoviruses.
- The measles virus is **very unstable** and is soon destroyed outside the human body.



Epidemiology

- The *source of infection* - a sick person
- *Infectivity* is greatest in the initial catarrhal stage and during the fourth days after the appearance of the rash
- *With complications* pneumonia infectivity during the tenth days after the rash
- The *aerial-droplet route* usually conveys infection

Epidemiology

- The virus is *expelled* from the organism in the secretion of the mucous membranes
- The *susceptibility* of humans to measles is very high (**susceptibility index 0.96**)
- *Infants* under three months of age are immune to measles

Pathogenesis

- The *portal* of entry is the mucous membrane of the respiratory tract, and the conjunctiva
- The *principal pathological changes* attending measles are inflammatory processes in the nasopharynx, respiratory organs, intestinal, and skin
- The *Belsky-Filatov-Koplik spots* are the result of an inflammatory process with small foci of degeneration of the epithelium buccal and labial mucosa

Pathogenesis

- The process in the bronchitis and bronchiolitis has a tendency to penetrate and format *interstitial pneumonia*
- In the *central nervous system* format serous meningitis and encephalitis
- The reactivity of the child's organism during measles is expressed in the condition known as *measles anergy*: positive tuberculin reaction disappears, the immune body's falls, the complement decreases

Clinical manifestations

- **The period of measles**
 - incubation period
 - catarrhal period
 - eruptive period
 - period of pigmentation
- The *incubation period* of measles is usually from 9 to 17 days. In children who have been vaccinated, or were given blood or plasma transfusions, the incubation period may even be as long as 21 days

Catarrhal period

- *a rise in temperature, headache, rhinitis, and cough*
- general malaise, *adynamia*, loss of appetite, and insomnia
- *conjunctivitis* expresses itself in conjunctiva hyperemia and photophobia and blepharospasm
- *enanthema* - red irregular spots varying in size can be seen on the mucosa of the soft, and in part of the hard, palate

Belsky-Filatov-Koplik's spots



- on the *buccal mucosa* on the line of opposition of the molar teeth, and less commonly on the lip inner surfaces and on the gums, occasionally on the conjunctiva
- *element looks* like a whitish papule, the size of a poppy-seed, surrounded by a narrow band of hyperemia, or areola

stage *begins* with a new rise of temperature

The eruptive period

first elements of the rash are found behind the ears and in the centre of the face

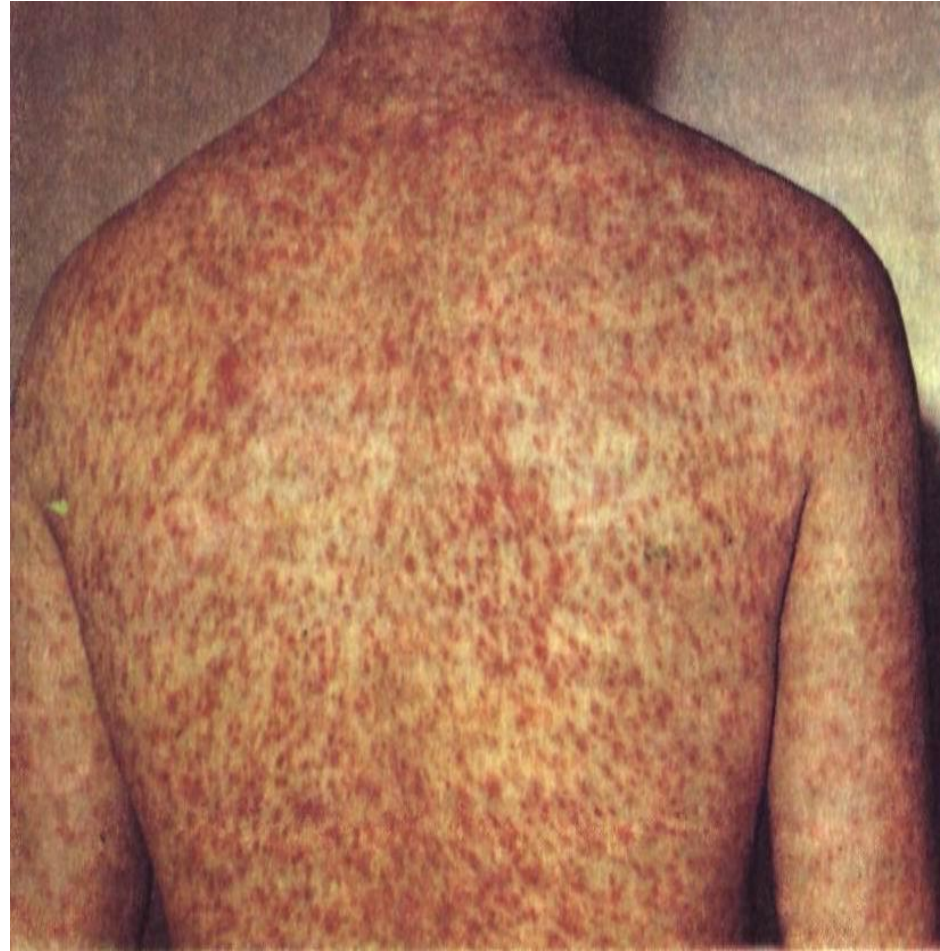
it spreads rapidly over the whole face, neck, and upper part of the chest.

On the second day, the exanthem rapidly spreads over the trunk and the proximal parts of the limbs, and *on the third* day covers the limbs



Elements of the rash

- look like *pink papules* of a soft consistency, the size of a grain of millet
- soon adjacent *maculopapules* become confluent, forming large blotches of irregular outline
- maculopapular elements have a *tendency to fuse further*
- rash exanthem *persists for three days*



Period of pigmentation

- the *rash* on the face fades on the third day when it appears on the extremities

- subsiding *rash* becomes less prominent and assumes a *cyanotic tinge*; its elements, gradually fading, leave spots of a *light-brown pigmentation* persists for *one or two weeks*



Blood

- *at the end of the incubation period*, the blood picture shows mild leukocytosis and neutrophilosis
- *at the end of the catarrhal stage* leukopenia and neutropenia,
- and *at the eruptive stage* leukopenia, often with a relative neutropenia, eosinopenia and thrombopenia

Classification

- *Typical form:*

- mild
- moderately severe
- severe.

- *Atypical forms:*

- measles with a toxic
- abortive
- rudimentary course
- mitigated

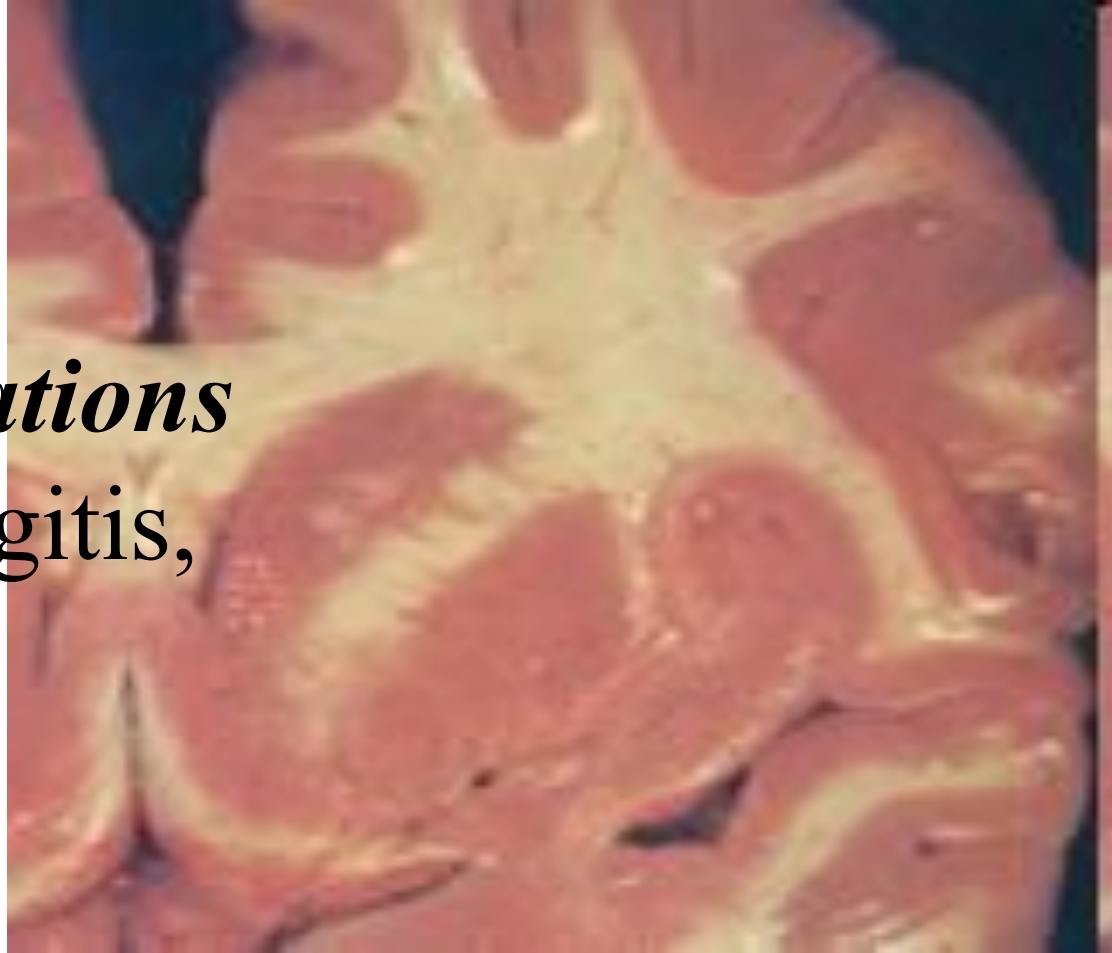
Mitigated form

- is in children who underwent *serum prophylactic* immunization
- the *incubation period* is protracted to a maximum of 21 days
- the *initial and eruptive* periods are shortened
- *catarrhal symptoms* in the mucous membrane are usually mild or absent
- the *enanthea and Belsky-Filatov-Koplik's* spots may not appear
- *rash* is usually sparse and sometimes is represented by few macularpupular elements
- *no complications* issues

Complications

- *Laryngitis* - of measles croup
- *Pneumonia* is one of the most common complications in measles: early pneumonia (in the catarrhal stage), secondary infection (pneumococcal, staphylococcal and streptococcal)
- *Complications of the alimentary tract* are stomatitis (gangrenous stomatitis or noma), dyspepsia is common, colitis
- Catarrhal *otitis*, purulent otitis, blepharitis and *keratitis*

Nervous complications
are serous meningitis,
encephalitis



Diagnosis

- Measles must be identified *as early* as possible.
- The diagnosis is based on *clinical symptoms*, taking into account the *epidemiological anamnesis*

In the catarrhal stage can resemble influenza and other respiratory viral infections

During the eruptive stage – Rubella; Scarlet fever, Serum rash, Drug rash

Specific diagnosis

- The diagnosis is *verified by a serological test* - hemagglutination-inhibition test, neutralization and the complement-fixation test. The increasing titer (4 times and over), as determined during a repeated test in 7-10 days, is a more reliable diagnostic sign

Treatment

- organized *hygienic conditions*, nursing care of the patient and protection from secondary infections
- *hospitalized* when they are severe and complicated; home conditions are unsatisfactory, or it is impossible to arrange due nursing care; when epidemiological signs are present
- *fresh and clean air* is very important for the patient
- *diet* should be nourishing, easily digestible, and have a minimum of solid particles; liquids and soups should be preferred

Treatment

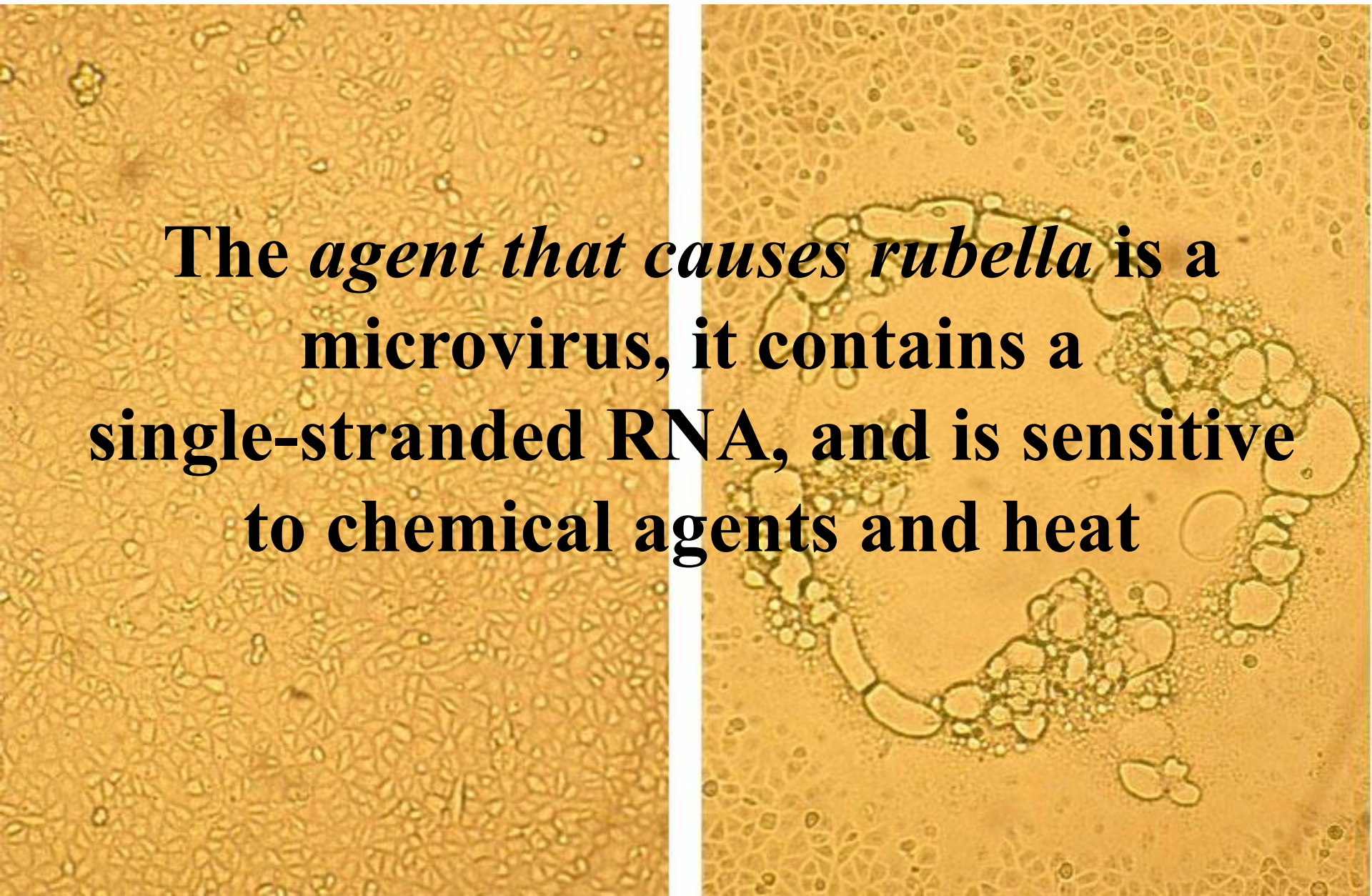
- *hospitalized* when they are severe and complicated;
home conditions are unsatisfactory, or it is impossible to arrange due nursing care;
when epidemiological signs are present
- *antibiotics* are given in case of complications, which are usually of bacterial nature

Prophylaxis

- *Carantin* is during 21 days after contact
- *Gamma-globulin* is only used for prophylactic purposes in a small number of children who were in contact with the measles patients and are 3-months to one year of age dose of 1.5 ml
- Patient should be *isolated* until the 5th day from the outbreak of eruption

Vaccine strategy is to immunize all infants at 12 to 15 months of age with measles-mumps-rubella (MMR) vaccine

Rubella



The *agent that causes rubella* is a microvirus, it contains a single-stranded RNA, and is sensitive to chemical agents and heat

Epidemiology

- The *source* of infection is a sick person, who probably becomes infective a few days before the disease becomes manifest
- *Contagiousness* does not probably disappear two weeks (and over) after the rash resolves
- The *aerial-droplet route transmits* the infection
- *Pregnant women* with manifest or symptomless rubella may become the source of intrauterine infection of the fetus
- *Susceptibility* to rubella is high
- Life-long stable *immunity* develops as a rule

Clinical Manifestations

- *incubation period* lasts 15-21 days, sometimes up to 24 days
- slight *rise in temperature* is noted
- occasionally slight malaise, *cough*, and reddening of the conjunctiva (*conjunctivitis*)
- *the typical symptom* is swelling of the post-auricular cervical, sub-occipital, and other lymph nodes, which develops 1-3 days before the eruption and disappears several days after it subsides

Rash

- the *rash* invades the face and neck, and covers the whole body within a few hours
- *localized* mainly on the extensor surface of the limbs
- *elements* are pale red, round or oval spots, with no tendency to coalesce
- rash lasts 2 or 3 days and disappears rapidly *without* leaving any *pigmentation* and desquamation



- **Blood counts**

demonstrate

leukopenia,

lympho, and

numerous plasma

cells (10-15 %)

Complications are

exceptionally rare :

- arthropathy,

- otitis,

- pneumonia,

- nephritis, polyneuritis

- encephalitis and

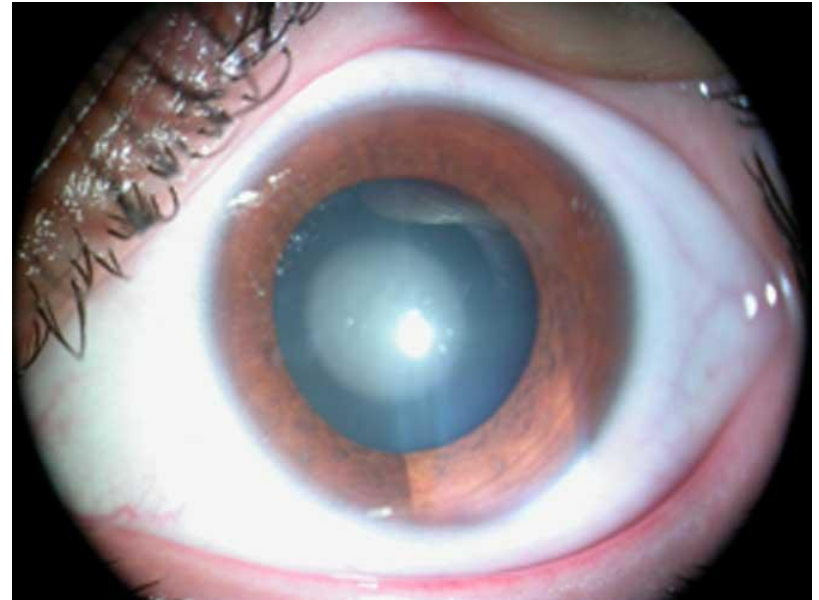
encephalomyelitis cases have

been reported

Clinical manifestations of congenital rubella:

“Congenital rubella syndrome” are :

- cataract,
- cardiac defects,
- deafness



Congenital rubella

- microcephalic hydrocephalus, deafness, cataract, retinopathy, microphthalmia, glaucoma, cardiac defects

A risk of various embryopathies arises in women with rubella:

- cataracts in the 5th-6th week,
- deafness in the 9th week,
- and cardiopathy in the 5th-10th week

Treatment

- no treatment is required
- patient should be isolated until the 5th day from the outbreak of eruption

Prophylaxis

- current vaccine strategy is to immunize all infants at 12 to 15 months of age with measles-mumps-rubella (MMR) vaccine and to administer a second dose of MMR during childhood

Scarlet Fever



Scarlet fever is an acute infectious disease, characterized by lesions of oropharynx with submaxillary lymphadenitis, fever toxemia, rash and then desquamation

Etiology

- *pathogen* of scarlet fever is a β -hemolytic *Streptococcus group A*
- have considerable *stability* to the influence of physical factors
- streptococcus produces *exotoxins* (Erythrogenous exotoxin)
- *stable antitoxic immunity* is acquired against erythrogenous toxin
- *bacterial antigens* of streptococcus and *antibodies* against them are typospecific and antibacterial immunity is not stable

Epidemiology

- Scarlet fever is **anthroponozic**
- The *source of infection* is a child with scarlet fever or with other forms of streptococcal infection (tonsillitis, nasopharyngitis).
- *Duration of infectious period* may fluctuate from some days to several weeks or sometimes months
- The principal *route* of scarlet fever infection is an *air-droplet one*. Alimentary route plays insignificant
- The *contagious index* is about 40 %.

Pathogenesis

- The principal *portal of entry* in scarlet fever is mucous membrane of oropharynx
- The infection may *penetrate* through damaged skin (in burns or injuries) or mucous membranes of the genitals (*extrabuccal scarlet fever*)
- complex pathologic process, which may be presented in the form of *three lines of pathogenesis*: toxic, septic and allergic ones

The toxic syndrome is the result of influence of the toxic substances produced by the hemolytic streptococcus

- the signs of toxemia in the form of **fever**,
- **rash**,
- **headache**, and **vomiting**,
- lesions of the **vegetative nervous system**

The septic syndrome

includes primary inflammation in the portal of entry and microbial streptococcal complications

- **purulent** one and spreading of hemolytic **streptococcus from the primary focus** to the surrounding tissue and through lymphatic and blood vessels

The allergic syndrome

- is *caused* by the sensitizing substances of hemolytic streptococcus, which are proteins
- *reaches* its peak on the 2nd -3rd week of illness
- allergic syndrome is *manifested* by various eruptions on the skin, myocarditis, glomerulonephritis, synovitis and "Allergic waves"

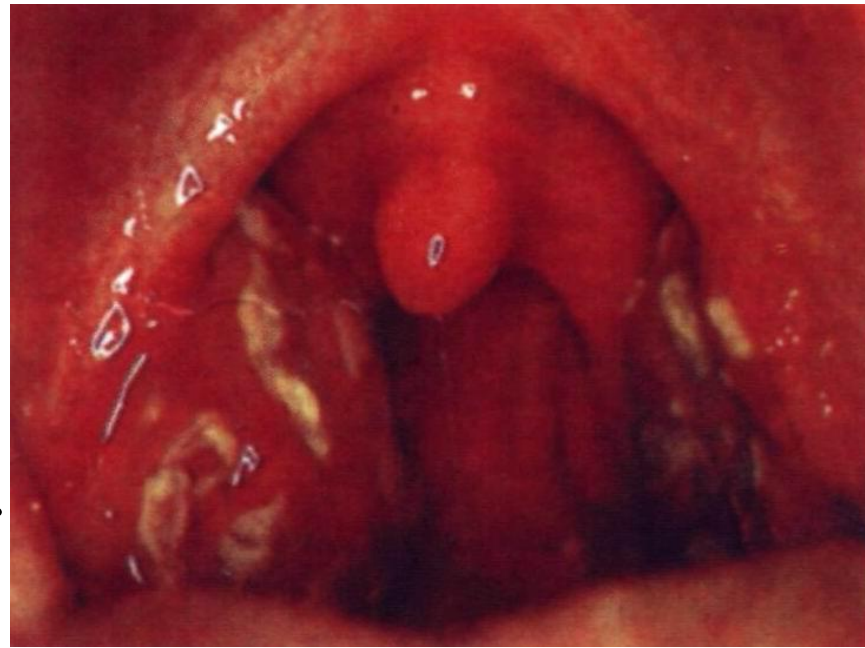
Clinical Manifestations

- The *incubation period* for scarlet fever is 2 to 7 days
- The disease is *started* in fever, vomiting, sore throat and toxic symptoms such as headache and malaise

Tonsillitis

is a typical sign of scarlet fever

- *Scarlatinal tonsillitis* may be catarrhal, follicular or necrotic
- *Tonsillitis* is accompanied by regional lymphadenitis
- The upper border of *hyperemia* is on the anterior palatal arches and on the base of the uvula (delimited hyperemia)



Tongue

- During the first 1 or 2 days the dorsum has a white "*fur coat*", and the tip and edges are reddened



- By the fourth or fifth day the white coat has *peeled off*
- The red, glistening tongue, studded with prominent papillae, presents the appearance of raspberry ("*raspberry tongue*")

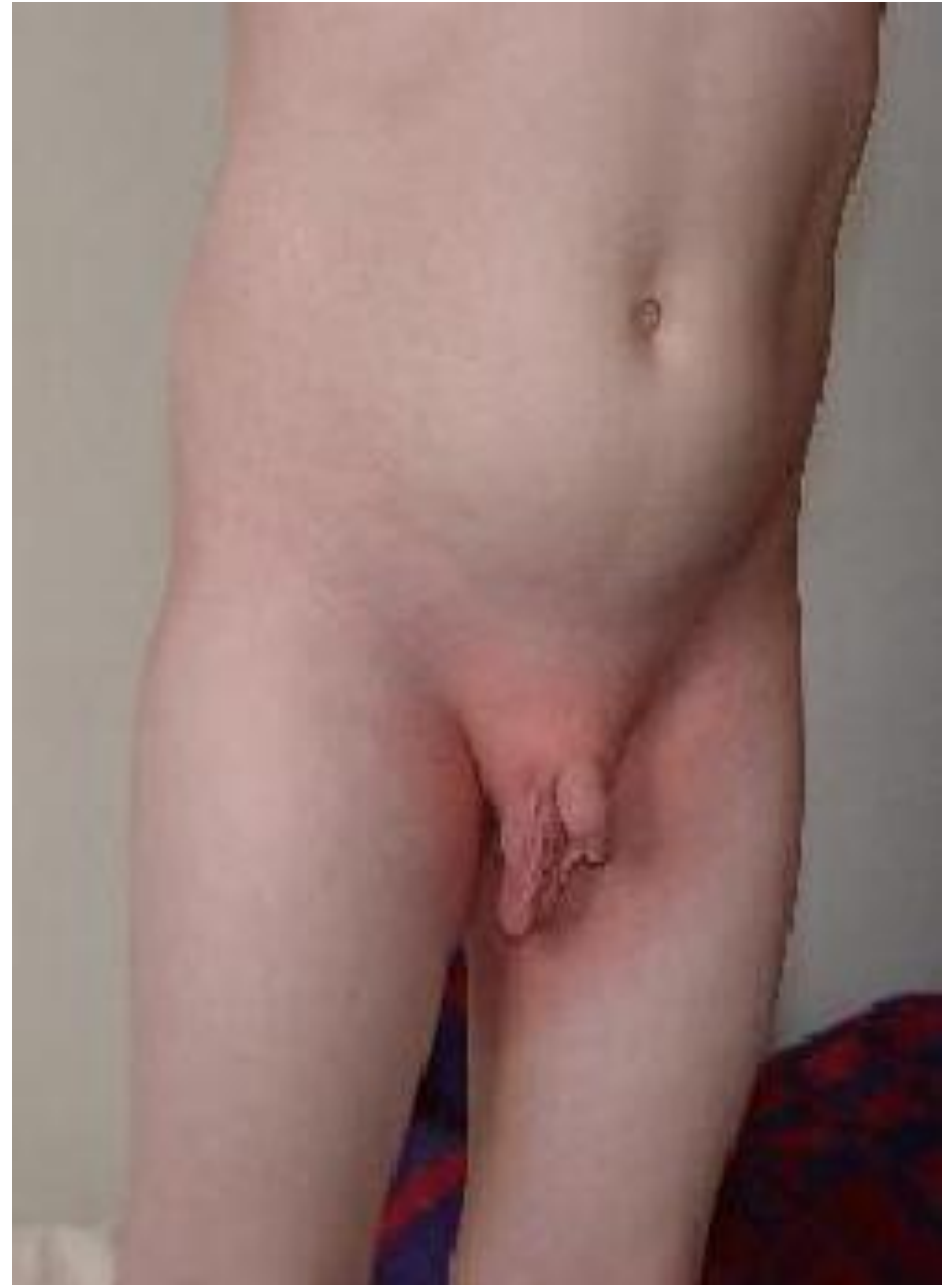


Exanthema

- It becomes *generalized very rapidly*.
- Patient *face is typical* in scarlet fever - cheeks are red, smooth and flushed, and the area around the mouth is pale, lips are crimson.

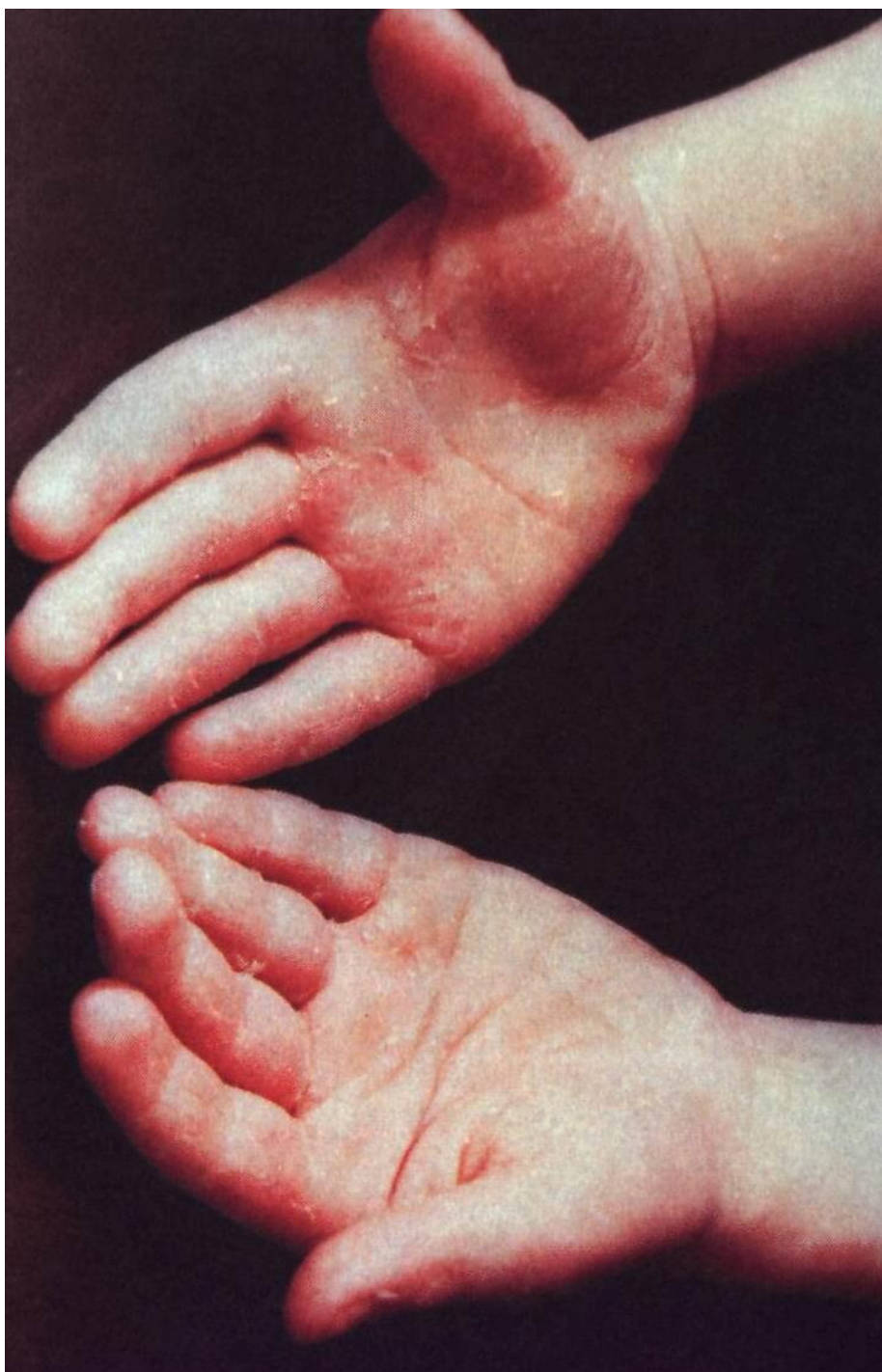


- Rash is more *intense in skin folds* such as the axillae, cubital, inguinal, popliteal, and also on skin of the neck, breast, abdomen, buttocks.



- Tiny petechiae occur in the creases of the folds of the joints and form transverse lines (*Pastia's sign*) that persist after the rash has faded.
- Rash usually *remains* for 4-5 days





Desquamation

- *initially* on the face on the second week as fine branny flakes
- *desquamation skin* of the trunk comes off in larger, thicker flakes
- sometimes a *retrospective diagnosis*

Cardiovascular changes

- *In acute period* of scarlet fever tachycardia, increased blood pressure
- Bradycardia, arrhythmia, decreasing of blood pressure, dull heart sounds, systolic murmur occur **the 4th-5th day of illness**
- N. F. Filatov has described the so-called “*scarlatinal heart*”
- The bases of these changes are extracardiac disorders of *vegetative nervous system*

There is *leukocytosis, neutrophilia, increased ESR* in the acute period of scarlet fever

Classification

- *Typical*: mild, moderate, severe
- *Atypical* (extrabuccal forms) - they are characterized by a short-term incubation period, absence of mild tonsillitis, rash appears near the portal of entry, it is more intensive there: burn, injury, puerperal
- The forms with *aggravated signs* are atypical too; they are hypertoxic and septic ones

Complications

- early one (first week) - *septic complications* are tonsillitis, lymphadenitis, otitis media
- allergic ones the late one (2nd-3rd week) - *allergic complications* include lesions of kidneys (nephritis), heart (myocarditis) and joints (synovitis)

Treatment

Hospitalization takes

- Severe course of scarlet fever with various complications.
- Children from boarding schools and other institutions

Antibiotics should be

administered

- Penicillin should be given in the dosage of 100 000/kg/ day for 7-10 days

Prophylaxis

- *Specific prevention* of scarlet fever has not been devised.
- The patients with scarlet fever are *isolated* for 22 days.
- The children who had *contacts* with the patient should be observed for 7 days