Human Respiratory Syncytial Virus Infections (HRSV)

Respiratory syncytial virus infection is an acute respiratory disease clinically manifested by bronchiolitis and pneumonia, moderate intoxication, but of particular severity in infants and newborns.

ETIOLOGIES.

- HRSV belongs to the Paramyxoviridae family (genus Pneumovirus).
- It contains RNA~90 -120 nm in diameter.
- It is slightly resistant to the external environment and quickly inactivated by water, soap and disinfectants.
- No hemagglutinin and neuraminidase were detected in the RSV structure.
- Two virus serotypes are known to have a common complement-fixing antigen.

- Outbreaks of RSV infections break out each year, affecting a large part of the infant population. RSV is one of the most important causative agents in airway pathology in premature infants and children in the first 6 months of life, with severe forms.
- In infants, RSV causes 45-50% of bronchiolitis and 23% of pneumonia in young children.
- In children up to 5 years this agent causes 25% of pneumonia, 11% of bronchitis and 10% of croup.
- It can affect any segment of the respiratory tract. In 30% of patients, RSV infection is assessed in combination with others ARI (influenza, adenovirus).

Epidemiology

The source of infection is the sick person, less often carriers of RSV. The patient is contagious for 10-14 days. The contagion is very high (the virus can affect 90% of young children in a community).

- **The transmission** is made by air, by drops.
- **The receptivity**, being very high in infants and young children, is gradually replaced by a comparatively higher resistance (but not totally protective) in the older child and the adult. The most severe cases occur in children with pre-existing heart, lung or immune disorders. Other risk factors for severe illness are: prematurity, exposure to cigarette smoke, poor socio-economic living conditions.
- **The increased incidence of RSV** infection is in winter, but it is also attested in spring. Sporadic cases can be year-round.
- **Immunity** is neither complete nor durable, which explains the possibility of reinfections.

Pathogenesis

- The virus penetrates into the human organism through the nasal mucosa and conjunctiva.
- HRSV affects the respiratory tract, from the upper to the lower parts.
- The immunity after infection is short lived and incomplete.
- After multiple reinfections a temporary protections appears, and the disease is milder.
- The mucosal IgA, serum antibodies and cell-mediated immunity have a role in protection.

Clinical manifestations

- **The incubation period** lasts for 3 to 7 days.
- **The onset** is usually gradual, with affections of the upper and lower respiratory tract.
- The affection of the upper airways is manifested by rhinitis, cough, sometimes hoarse voice.
- The general condition is almost unaffected, the temperature is either normal or low fever.

- The lower respiratory tract is very frequently involved in infants.
- Bronchiolitis is characterized by a strong dyspnea of the mixed type with prevalence of difficult expiration.
- The picture of respiratory insufficiency is supplemented by cyanosis. All these symptoms subside completely in 2-6 days.
- Pneumonia (micro focal, segmental) occurs in 25 % of cases on the average.
- Severe forms appear in premature infants, in those with congenital heart disease, or in the immunosuppressed.
- The elderly can develop severe pneumonia.

RSV infection in newborns and infants

- The onset of the disease is gradual, with normal temperature, "clogged" nose, persistent coughing, cyanosis of the skin, vomiting often occurs, regurgitation.
- Difficult nasal breathing leads to the disorder of the general condition, the appearance of agitation, insomnia.
- Pneumonia develops, the number of breaths reaches up to 80-100 per minute, tahicardia, multiple crackling and small bullous wet rales are determined.
- Radiologically in the lungs is detected pulmonary hyperinfiltration, accentuated pulmonary interstitial and allelectases.
- The evolution of RSV infection is long.
- Complications caused by bacterial superinfections aggravate the prognosis.

Diagnosis

- The diagnosis can be suspected on the basis of a suggestive epidemiologic date, clinical manifestations
- The specific diagnosis is established by detection of virus in respiratory secretions by immunofluorescence or ELIZA techniques.
- In addition to isolation of the RSV, serological methods are also used in the laboratory diagnostication: complement-fixation test and the neutralization test.

Treatment and Prevention

- The therapy is symptomatic and pathogenic.
- Antibiotics are used in case of bacterial complications.
- Severe cases need hospitalization.
- There is no vaccine available, general preventive methods should be applied.

- The prognosis is favorable, except in severe cases complicated by pneumonia in infants and newborns.