# Mumps virus

## Important properties

- It belongs to paramyxoviruses.
- ssRNA genome.
- Helical nucleocapsid.
- Enveloped.
- It has spikes: three types of antigens H(for attachment), N(for release) and F (fusion antigen for entry of virus).
- It has one serotype

## Source and transmission

- Humans are natural host.
- Mumps virus is highly contagious. It is transmitted via respiratory droplets, salivary secretion, or urine (viruria is common).

## Pathogenesis

- The virus infects epithelial cells of URT and then spreads through blood to salivary glands , primarily parotid glands , testes, ovaries, pancreas, kidney, and in some cases to CNS(meninges).
- Alternatively the virus may ascend from buccal mucosa up Stensen duct to parotid glands.

## Clinical Finding

- Incubation period is 18-20 days; it causes **mumps** characterized by swelling of parotid gland either unilateral or bilateral, that painful. Parotitis occurs in less than 50% of infection. Fever ,malaise, anorexia are associated with the disease.
- 2 complication; orchitis (testes inflammation) in adults males , if bilateral of testes can result in sterility. Other complication is meningitis.
- It is common disease in school-age children. Most cases occur in winter. 30% of children have sub-clinical infection.
- Lifelong immunity occurs in infected persons.
- Maternal Abs pass the placenta and provides protection during first 6 months of life.

## Laboratory Diagnosis

- Detection of S (soluble)-antigen (NP) by CFT indicate current infection.
- Detection of V( viral)-antigen indicates past infection. Also skin test can be used to detect previous infection.

## Control

- No specific antiviral therapy.
- MMR-vaccine (combined: mumps, measles and rubella) is given for children at 15 months.

---

# Measles virus

## Important properties

- It belongs to paramyxoviruses.
- ssRNA genome.
- Shape of virus is spherical and helical symmetry.
- Enveloped.
- It has spikes: two types of antigens H and F.
- It has single serotype.

## Source and transmission

- Humans are natural host.
- It is transmitted by inhalation of respiratory droplets during coughing.
- It is high communicable with 90% infection rate.

## Pathogenesis

The virus initially infects epithelial cells of trachea and bronchi of respiratory tract and then spread and multiplies in LNs. then the virus enters blood (viremia) and disseminated to distant sites throughout the body , including skin and mucosa.
Maculopapular rash is appear due to cell-mediated immunity attack by cytotoxic T-cells on measles-infected vascular endothelial cells in skin. Antibodies may play role in vasculitis.
Formation of multi-nucleated giant cells, resulting from fusion of infected cells with neighboring uninfected cells (due to F-protien), is characterized pathogenic feature of measles infection.The virus evades neutralizing Abs by H-antigen or it

spreads directly cell to cell by F-protein. It also evade immune recognition by it ability to induce temporary general immuno-suppression.

## Clinical Finding

- Incubation period (10-14 days), It causes **measles**, prodromal phase of disease characterized with fever, runny nose, cough, coryza, and conjunctivitis (photophobia).
- After few days, 2-3 , Small white spots on inflamed buccal mucosa membrane (koplike spots) appear inside cheek, followed by maculopapular rash appearing first on head, and spreading to trunk.
- Most cases occur in children.
- Complication particularly in mal-nutrition children and immuno-compromised patients: like otitis media, pneumonia, deafness and encephalitis. In pregnant women may lead to stillbirth.
- One infection confers lifelong immunity.

## Laboratory Diagnosis

- Serological tests like ELISA.
- Genetic technique like PCR.

## Control

- Non-specific therapy, but sensitive to ribavirin.
- MMR vaccine is given to children at 15 months of age.

**********

Good Luck