

Summary

MERS-CoV & other viruses transmitted by respiratory system

- **Coronavirus:** (*reminder*)
 - **Enveloped** virus with **+ve** polarity **ss-RNA** genome.
 - Transmission: Inhalation of infectious aerosol droplets.
 - Clinical symptoms: The **2nd** cause of common cold.
 - Coronavirus also causes zoonotic disease
- **SARS-CoV: Severe Acute Respiratory Syndrome :**
 - (SARS) emerged in China after a new mutation of coronavirus.
 - The animal reservoir may be **cats**.
 - SARS starts with **high fever** followed by cough with difficulty in breathing (**atypical pneumonia**). It is associated with high mortality due to respiratory failure.
 - SARS-CoV is more **aggressive** than MERS-CoV.
- **MERS-CoV: Middle East Respiratory Syndrome Coronavirus :**
 - MERS-CoV infected several human cells , including **lower** but **NOT upper respiratory tract**, *also kidney, intestinal, and liver cells* .
 - **Epidemiology:** Highly infectious, peak in winter, incubation period: **2-14 days**.
 - **Transmission:** through **close contact** with ill people, and can be acquired from **close contact** with animals (bats + camels). However, there is **no evidence** of sustained spreading in community settings. (*no epidemic, no pandemic*)
 - **Dromedary camels** are the primary animal host for MERS-CoV.
 - MERS-CoV is closely related to several **bat** coronaviruses. using a **PCR** assay, Coronavirus **RNA sequences** are found frequently in bat fecal samples.
 - **Clinical Features:** Most people developed severe **acute respiratory illness**. They have **fever**, cough, and shortness of breath. Some people also have **gastrointestinal** symptoms. Some infected people have **mild symptoms** or **no symptoms** at all and they recover completely.
 - **Complications:** Severe complications include **pneumonia** and **kidney failure**. A percentage of people with MERS-CoV **died**. Individuals with weakened immune systems and people with comorbidities are also at higher risk for getting MERS or having a severe case.

- **Lab diagnosis:** Detection of the viral nucleic acid by **PCR**, **serology** by detection of **IgM** , and by isolation of the virus from **Nasopharyngeal aspiration (NPA)**.
- **Treatment:** **No** specific antiviral treatment.
- **Prevention:** By taking **everyday preventive actions**.
- **Measles Virus:**
 - **Enveloped** virus with **-ve** polarity **ss-RNA** genome.
 - Measles virus infects **human only**.
 - **Transmission:** Inhalation of infectious **aerosol droplets**.
 - **Epidemiology and pathogenesis:** Most cases in **preschool children**, **very infectious** cases mainly in **winter** and **spring**. Virus infects first epithelial cells of **respiratory tract**, then virus spread to the **blood** causing viremia (**high fever**), the virus widely disseminated to the **skin** with **maculopapular** rash.
 - **Clinical features:**
 - → incubation period: **7- 14 days**.
 - → **Koplik's spot:** **Small white** papule appear in **buccal** mucosa.
 - → **Rash:** **Maculopapular** rash first on **face**, **trunk**, then **extremities**.
 - → **Recovery complete** in normal children with **life long immunity**.
 - **Complication:**
 - 1- **Encephalitis:** **Acute** or **Subacute sclerosing pan encephalitis (SSPE)**
 - 2- **Giant cell pneumonia:** in immunocompromised children. (*rare condition*)
 - **Lab diagnosis:** **Serology** by detection of **IgM** , and in case of **SSPE** detection of measles antibodies in **CSF**.
 - **Treatment and prevention:** **No** specific treatment, Prevention by giving the **live attenuated** vaccine (**MMR**) for Measles, Mumps and Rubella (given to all children at **15 months** and as **booster dose** at school entry).
- **Mumps Virus:**
 - **Enveloped** virus with **-ve** polarity **ss-RNA** genome.
 - **Transmission:** Inhalation of infectious **aerosol droplets**.
 - Mumps virus infects **human only**.
 - **Epidemiology:** **Highly infectious**, peak in **winter**, **long** incubation period: **18-21 days**.
 - Mumps: is an **acute benign viral parotids**. Parotids (painful **inflammation** and **swelling** of **salivary** gland), it is a disease of children (**5-15 years**), but also can be seen in **young adult** with **more complicated** feature.

- Infection started in the epithelial cells of **upper respiratory tract**, then virus spread by **Viraemia** to **parotid gland** mainly and to other organs as: testis, ovary, pancreas and CNS.
- **Clinical Features:** Classic mumps, Sudden onset of **fever** and **painful swelling of parotid gland**. **Self-limiting** disease resolve within one week. Solid and long life immunity occurs.
- **Complications:** Seen mainly if infection occur in **young adult** as: **Orchitis** bilateral can lead to sterility and Oophoritis, Thyroiditis, Meningitis.
- **Lab diagnosis:** **Serology** by detection of **IgM**.
- **Treatment and prevention:** **No** specific antiviral treatment. **MMR:** *live attenuated* vaccine.
- **Parvovirus B19:**
 - Small **Non** enveloped **ss-DNA** (*single strand DNA*).
 - Incubation period: **4-10 days**.
 - **Transmission:** Inhalation of respiratory droplets, blood transfusion, also by blood transfusion can occur from mother to baby.
 - **Epidemiology and target group:** Worldwide and mostly in winter and spring, Children (**5-10 years**). The virus causes **slapped cheek**, erythema infectiosum (*fifth disease*).
 - Recovery: is **complete**.
 - **Complications:**
 - → **Aplastic crisis** sudden and temporary disappearance of **erythroblasts** from the **bone marrow**, seen in patients with **hemolytic anemia**. The bone marrow does **not** produce RBC.
 - → **Chronic anemia** occurs in the immunocompromised when the immune system is unable to produce antibodies to neutralize the virus.
 - → **Hydrops fetalis** occurs during pregnancy when the **mother** become infected with parvovirus B19.
 - **Lab diagnosis:** detection of **IgM** antibody by **ELISA** or **PCR**.
 - **Prevention:** There is **no** vaccine available.
 - **Treatment:** There is **no** specific antiviral drug therapy.