

Orthomyxoviridae (Influenza viruses) الإنفلونزا

Negative sense, single-stranded RNA, enveloped viruses with a SEGMENTED GENOME that replicate in the NUCLEUS. جينوم الإنفلونزا عبارة عن عدة قطع، كل قطعة بتعطي بروتين مختلف

Based on the differences in the nucleoprotein, influenza viruses are classified into types:

Type A, Type B and Type C.

Based on the differences in the hemagglutinin protein (H) and neuraminidase protein (N), only Type A is classified into subtypes (e.g., subtype H1N1 الإنفلونزا الإسبانية، الإنفلونزا الخنازير، subtype H5N1 إنفلونزا الطيور، subtype H3N2).

Type A can cause pandemics if exchange of influenza gene segments occurs between human and animal/bird strains (the result is antigenic shift (تحول مفاجئ)). Type A and type B can cause outbreaks (epidemics), through mutations (antigenic drift (انحراف طفيف)).

Type C causes common cold.

Transmission: respiratory secretions, aerosols.

Tropism: epithelial cells of the respiratory tract.

Clinical features:

- A. High fever and chills.
- B. Frontal headache.
- C. Generalized weakness.
- D. Myalgia, arthralgia (أوجاع في العضلات والمفاصل).
- E. Sore throat.
- F. Dry cough.
- G. Pneumonia (children, elderly, those with chronic disease). Secondary bacterial pneumonia can also occur (*Staphylococcus aureus*, *Streptococcus pneumoniae*, *Haemophilus influenzae*, Gram-negative bacilli).

Diagnosis:

Rapid antigen detection.

PCR.

Treatment: Supportive, antivirals (oseltamivir (Tamiflu), zanamivir (Relenza)).

Prevention: Live attenuated, inactivated and recombinant vaccines are available. Trivalent (2 A strains and 1 B strain) or quadrivalent (2 A strains and 2 B strains) are available.

Epidemiology: Seasonal outbreaks occur in winter as a result of declining immunity and antigenic drift with types A and B as the causative agents. Pandemics occur only with type A as a result of antigenic shift.

Coronaviridae

Positive sense, single-stranded RNA, enveloped viruses with a large genome that replicate in the cytoplasm.

Four types cause common cold: 229E, OC43, HKU1 and NL63

Two types caused severe acute respiratory distress syndrome: SARS-CoV-1 and MERS-CoV (Middle East respiratory distress syndrome coronavirus).

Mortality of SARS: about 10%

Mortality of MERS: 36%

Diagnosis:

PCR.

Treatment: Supportive.

Vaccination: Not available so far.

SARS-CoV-2 and COVID-19 are not required for the exam.