

Short Note on Influenza Persistence

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DESCRIPTION

In the US, influenza (flu) causes 9 to 45 million illnesses, leading to 12,000 to 61,000 deaths annually. World Health Organization estimates that worldwide annually there are about one billion infections, 3-5 million severe illnesses and 300,000-500,000 deaths. Influenza is caused primarily by influenza A and influenza B viruses. Influenza A is the cause of pandemics. Influenza will continue to be prevalent because its current vaccines are safe but only 30%-60% efficacious. In contradistinction, COVID-19 vaccines have an efficacy of about 90%. Additionally, new zoonotic influenza strains intermittently migrate to humans. Influenza is a major part of "The New Normal."

Co-infection

Since the start of COVID-19 pandemic, influenza is of greater concern. Overlapping spread of both diseases is a major strain on the health care system. Their Co-infection is not common but may cause more severe disease. Influenza vaccination and therapy are important in addition to COVID-19 vaccination and therapy, especially in persons at increased risk.

Incubation

Influenza's median incubation period is 2 days. Patients are infectious for a day before and 5 to 7 days after symptoms. COVID-19 has an incubation period of 4-12 days, a median of about 5 days. Patients are most infectious from 2 days before symptom onset. Influenza symptoms peak in 3-7 days.

Transmission

About one-half of influenza a cases is due to aerosol transmission. Adequate ventilation can reduce it. Precautions utilized during the COVID-19 pandemic reduced the incidence of influenza in 2020. Used appropriately, surgical masks reduce the concentration of aerosolized influenza virus by about ten-fold and are adequate for prophylaxis against influenza. Transmission by respiratory droplets can also be reduced by

masking. Transmission by direct contact can be reduced by hand and general hygiene. COVID-19 is transmitted in a similar manner.

Influenza-Like Illness (ILI)

The Centers for Disease Control define ILI as fever or greater and cough or sore throat that is not due to another known cause including streptococcal pharyngitis. ILI's causes can be benign such as common cold or severe including sepsis, meningitis, COVID-19, and SARS. Often there is an abrupt onset. SARS leads to severe disease in most of the infected.

Diagnostics tests

These include nucleic acid amplification via Polymerase Chain Reaction (PCR) and antigen-based immunological assays. A PCR test can be performed even at the point-of-care with results available within an hour. A single test can detect Influenza A, Influenza B, respiratory syncytial virus, and SARS-CoV-2. This can facilitate infection control and utilization of antiviral therapeutics. It is especially useful for patients who have severe symptoms or are hospitalized.

Influenza vaccine

It is the best preventive measure. Although not very efficacious, it substantially reduces morbidity and mortality because of high prevalence of influenza. It is recommended for anyone over 6 months of age. The T cell response vaccines elicit is substantially weaker than the antibody response. Children may need two doses of vaccine, at least four weeks apart. The vaccine should be administered at least one week before surgery.

Available vaccines

The influenza virus mutates frequently. Quadrivalent vaccines protect against four of the currently most prevalent strains of influenza. The vaccines are altered every year for the predicted prevalent strains. Nine vaccines from four manufacturers are available in the US. Inactivated influenza vaccine is most

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commonly used. It is approved for persons above 6 months of age. The vaccine is usually administered intramuscular, but a lower dose intradermal vaccine is non-inferior.

Future vaccines

Universal vaccines that provide durable response against all influenza strains are in human trials. These vaccines generate antibodies against the viral hemagglutinin protein stem domain. Current vaccines generate antibodies against the globular head domain, which is variable and mutates much more frequently. Vaccines utilizing mRNA are also in human trials.

Influenza therapeutics

However, their efficacy is limited, especially in patients with serious illness. They are expensive and not widely utilized. Although influenza and COVID-19 have similar initial symptoms, their therapeutics is different. Thus, dexamethasone reduces mortality for hospitalized COVID-19 patients on respiratory support but may increase mortality for hospitalized influenza patients. Overlapping occurrence of influenza pandemic and COVID-19 will be devastating.