



COMMENTARY

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Diagnosis and the Pathophysiology of Influenza

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Description

Influenza, usually known as “the flu,” is an infectious sickness caused by influenza viruses. Among the symptoms include fever, runny nose, sore throat, headache, coughing, and tiredness, which can range in severity from mild to severe. These symptoms start one to four days after being infected to the virus and last for about 2 to 8 days. Vomiting and diarrhea are rather common, particularly in young children. Pneumonia can occur as a result of influenza, either from the virus itself or from a subsequent bacterial infection. Other complications of infection include acute respiratory distress syndrome, meningitis, encephalitis, and the worsening of pre-existing medical disorders such as asthma and cardiovascular disease.

Pathophysiology

Epithelial cells in the respiratory tract are the first targets of infection for influenza viruses in people. Sickness during infection is mostly caused through lung inflammation and weakness caused by epithelial cell infection and death, combined with inflammation caused by the immune system's responses to infection.

Although non-respiratory organs can be affected, it is unknown how influenza is causing these cases. The bronchoconstriction, loss of alveolar structure, loss of lung epithelial integrity due to epithelial cell infection and death, and degradation of the extracellular matrix that preserves lung structure are just a few of the many, non-exclusive mechanisms that can result in severe respiratory illness. As reduced gas exchange and the ability for viruses to infect endothelium cells, which generate a high amount of pro-inflammatory cytokines, are caused by alveolar cell infection, severe symptoms in particular seem to be the cause of this.

High levels of viral replication in the lower respiratory tract and a potent pro-inflammatory response known as a cytokine storm are characteristics of influenza-related pneumonia.

Since these white blood cells are crucial in the body's response to bacterial infection, early depletion of macrophages during influenza produces a favorable environment in the lungs for bacterial development in bacterial infections. It's possible for host processes to promote tissue regeneration to unintentionally promote bacterial infection. The development of systemic glucocorticoids, which can lessen inflammation and maintain tissue integrity but promote faster bacterial growth, is also triggered by infection.

Immunology

Viral RNA can be detected by sensors in cells, which can subsequently trigger the synthesis of interferon. The production of antiviral proteins and proteins that draw immune cells to the site of infection is mediated by interferon, which also alerts neighboring uninfected cells to the presence of infection.

Pro-inflammatory cytokines are released by some infected cells, which take immune cells to the infection site. Immune cells prevent viral infection by phagocytosing viral particles and apoptotic cells as well as destroying infected cells. A cytokine storm caused by an aggravated immune response, however, can be harmful to the host organism. The non-structural proteins NS1, NEP, PB1-F2, and PA-X, which are involved in inhibiting interferon production and host gene expression, are produced by influenza viruses as a means of delaying the immune response.

Diagnosis

In otherwise healthy individuals during seasonal ep-

idemics, symptom-based diagnosis is often reliable. Sepsis, acute respiratory distress syndrome (ARDS), pneumonia, encephalitis, myocarditis, and the breakdown of muscle tissue should all raise suspicions, however. While other viral respiratory tract infections and influenza have similarities, a laboratory diagnosis is required to confirm the diagnosis. Nasal and throat swabs are frequent methods of obtaining samples for testing. If an illness has cleared the upper respiratory tract but

not the lower, samples from the lower respiratory tract may be collected. Anybody hospitalized with flu-like symptoms during flu season or who is associated with an influenza case should get tested for influenza. Early diagnosis enhances patient outcome in severe circumstances. Viral cultures, tests that detect antibodies and antigens, and tests based on nucleic acids are all diagnostic techniques that can detect influenza.