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Journal of Current Synthetic and Systems Biology

Opinion Article

Pathophysiology and Treatment of Infectious Diseases

Anastasia Dressler*

Department of Pediatrics and Adolescent Health, Medical University, Vienna, Austria

DESCRIPTION

In medicine, infectious disease is a process caused by an agent, usually a type of microorganism that impairs a person's health. In many cases, infectious disease can be passed from person to person, either directly (via skin contact) or indirectly (via inhalation) (e.g., via contaminated food or water). Infectious diseases remain one of the leading causes of death in both developed and developing countries. Infections cause significant morbidity and mortality, especially in individuals who are most vulnerable to illness: the very young, the elderly, the immune compromised, and the disenfranchised. The pathogenesis of infectious diseases reflects the relationship among the human host, the infectious agent, and the external environment. Infection results when an exogenous agent is introduced into a host from the environment or when an endogenous agent overcomes innate host immunity to cause disease. Host susceptibility plays an important role in either of these settings.

Pathophysiology

Infections follow a general sequence of events known as the infection chain. The chain of events includes the infectious agent, reservoir, entry into a susceptible host, exit, and transmission to new hosts.

Colonization

Infection occurs when an organism enters the body, grows, and multiplies. This is known as colonisation. Most people are resistant to infection. Those with compromised or weakened immune systems are more vulnerable to chronic or recurring infections. Individuals with a suppressed immune system are more vulnerable to opportunistic infections. Wound colonisation describes the presence of non-replicating microorganisms inside the wound, whereas infected wounds have replicating organisms and tissue damage. Extrinsic organisms colonise all multicellular organisms to some extent, and the vast majority of these have a mutualistic or commensal relationship with the host.

Disease

Disease can develop once the host's protective immune mechanisms are compromised and the organism causes harm to the host. Microorganisms can cause tissue damage by releasing toxins or damaging enzymes. Some infectious agents are extremely dangerous. The prion that causes mad cow disease and Creutzfeldt-Jakob disease kills all infected animals and human.

Classification

Primary versus opportunistic: Few microbes, despite their numerous kinds, cause disease in otherwise healthy people. Infectious disease is caused by the interaction of a few microorganisms with the antibodies of the hosts they infect. The appearance and severity of disease caused by any pathogen are determined by the infection's ability to harm the host as well as the host's ability to resist the pathogen.

Primary pathogens: Primary pathogens create disease by being present or active within a normal, healthy host, and their intrinsic virulence (the severity of the disease they cause) is a necessary byproduct of their drive to reproduce and spread.

Secondary infection: A primary infection is the root cause of an individual's present health problem, whereas a secondary infection is a sequel or complication of that main cause.

Prevention

Hand cleaning, gowning, and wearing face masks can all help prevent illnesses from spreading from person to person. Other measures of prevention include abstaining from illicit drugs, using a condom, gloves, as well as maintaining a healthy lifestyle that includes a well-balanced diet and regular exercise.

Treatment

Anti-infective medications can inhibit an infection once it infects the body. Depending on the organism addressed, there are several main categories of anti-infective medications available,

Correspondence to: Anastasia Dressler, Department of Pediatrics and Adolescent Health, Medical University, Vienna, Austria, E-mail: dresslerA@gmail.com

Received: 18-Jul-2022, Manuscript No. CSSB-22-19411; **Editor assigned:** 21-Jul-2022, PreQC No. CSSB-22-19411 (PQ); **Reviewed:** 04-Aug-2022, QC No. CSSB-22-19411; **Revised:** 11-Aug-2022, Manuscript No. CSSB-22-19411 (R); **Published:** 19-Aug-2022, DOI:10.35248/2332-0737.22.10.006.

Citation: Dressler A (2022) Pathophysiology and Treatment of Infectious Diseases. J Curr Synth Syst Bio. 10:006.

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including antibacterial (antibiotic; includes antitubercular), antiviral, antifungal, and antiparasitic (including antiprotozoal and antihelminthic) compounds.

Depending on the severity and type of infection, the antibiotic may be administered orally, intravenously, or topically.