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Infectious Diseases-Emergence, Diagnosis and Treatment

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Pathogenic organisms like bacteria, viruses, fungi, or parasites cause infectious diseases in Human. Infectious diseases spread from one individual to another. There are Zoonotic diseases where infection is transmitted from animals into humans. During infection, pathogens either interfere with normal body processes or can trigger immune system to generate defense bodies which result in high fever, inflammation or several other symptoms. Infection can happen through contact with body fluids, through aerosol via coughing and sneezing, via vectors like mosquito. Major causes of deaths worldwide are due to deadly infections. When infectious agents evolve and become resisting to drugs being used, it is very difficult to control the infection spread. These infectious agents either mutate their DNA or acquire new genes and become resistant to antibiotics and survive even if drugs used which normally kill them. Scientists across the world are focusing on new approaches for providing treatment to infectious diseases and investigating how pathogens evolve drug resistance.

Viruses are very tiny in size and they replicate or survive only in living cells or organisms. Their structure is simple and contains genetic material (DNA or RNA) inside protein capsule. They are capable of infecting all life forms like bacteria, plants or humans. Viral infections can be prevented using vaccines. Bacteria are single cellular and having structure of a ball, rod or spiral. Most of the bacteria are beneficial and only one percent cause illness. Bacteria cause infection by growing and dividing inside host body and some release toxins. Usually antibiotics are given to treat bacterial infections. Fungi are differentiated with cell wall made up of chitin. Most fungi are not harmful to infections and very few are dangerous, even cause death. Fungal infections commonly affect skin, nails or lungs. Examples include itching on skin, ringworm and thrush. Parasites are dependent on host organism nutrients. They are often seen in digestive system, brain, eyes, blood and liver.

The symptoms of infection range from mild to severe and treatment is given based on cause of illness. People with existing health problems like cancer or diabetes, who underwent organ

transplants, who are not vaccinated, who has suppressed immune response in their body, who travel to high risk virus endemic zones are more prone to infections. Diagnosis is done to identify the cause of symptoms. It include laboratory test where body fluids from patient are collect and checked for presence of any microbe or sometimes scanning images can be suggested. Common body fluids that are collected for diagnosis are blood, urine (painless), throat swabs, stool and spinal tab. imaging techniques like X-ray or computerized tomographic techniques help in more correct diagnosis of cause of infection. Sometimes biopsy can be done where infected body tissue is checked for existence of any pathogen.

Treatment for infectious diseases depends on germs that causing illness. Antibiotics are commonly suggested for bacterial infections. Antiviral drugs have been developed for few diseases like AIDS, Herpes, Hepatitis B, Hepatitis C and Influenza. But for common viral infections, vaccines are administered in to body to prepare immune system for future attacks. Topical antifungals are normally recommended for skin or nail infections and organ infections can be treated with oral antifungal drugs. In more severe conditions, where immune is weak, intravenous antifungal medications will be used. Anti-parasitic are used for parasitic infections like malaria.