

Biology

Disease 09.3

In whom the god of this world hath blinded the minds of them which believe not, lest the light of the glorious gospel of Christ, who is the image of God, should shine unto them. —Second Corinthians 4:4

Suffering

1. Sin is the cause of disease, suffering, misery, and death.
2. God allows suffering: 1) to show us the consequences of sin and 2) because we are responsible for choosing sin.
3. Rejecting God is choosing sin and its consequences.
4. Satan is the father of sin because he is the first to sin.
5. God gives everyone the freewill to choose to follow Satan and receive the consequences of sin or to follow Christ and be delivered from sin and condemnation.
6. Suffering inflicted on the innocent demonstrates that evil is cruel and has no mercy.
7. A world of sin and suffering is the consequence of choosing to sin and to follow the rebellion of Satan.

Causes of disease

1. **Disease** is a disorder in an organism that compromises its well-being.
2. **Pathologist** is specialist in identifying diseased tissues.
3. Noninfectious diseases include: most cancers, kidney stones, strokes, miscarriages.
 - a. Injuries caused by colliding, stretching, running, twisting, etc.
 - b. Organic disorders: nourishment, poisoning, radiation, tumors, clots, strokes, kidney stones
 - c. Genetic disorders
4. Infectious diseases include: polio, typhoid fever, HIV, flu, tuberculosis

Infectious diseases

1. Infectious agents causing diseases are called **pathogens**.
2. Infectious agents such as bacteria, viruses and prions can cause disease.
3. Some **infections** do not cause disease. These include both **commensal** and **mutualistic** gut microflora, skin colonies, other normal microflora that grow in organisms.
4. Normal microflora can cause disease if the body's immune system is weakened. These are called **opportunistic infections**.
5. **Epidemiologist** identifies the causes and source of infectious diseases.

Germ theory of disease

1. One germ-one disease. Every germ causes a unique disease.
2. Diseases were previously thought to be caused by bad air called **miasma**.
3. 1670 Anton van Leeuwenhoek observed microscopic organisms.
4. 1847 Ignaz Semmelweis required doctors to wash their hands with chlorinated water before delivering babies. Puerperal fever (childbed fever) was reduced from 18% to 2%.
5. 1854 John Snow determines the source of cholera outbreak in England by mapping incidences of disease and events leading up to the disease. Founder of epidemiology.

6. 1860 Louis Pasteur identifies the pathogens (origin of suffering) of puerperal fever and cholera and other diseases, and proposed decontamination procedures.
7. 1870 John Lister implements aseptic technique for surgeries.
8. 1880 Robert Koch, the father of bacteriological techniques, publishes article on the importance of isolating pure cultures to identify pathogens.
 - a. He isolated and purified the Anthrax pathogen that caused "wool sorter's disease".

Koch's postulates

1. Identify an organism present in diseased organism but not in healthy.
2. Grow pure culture.
3. Reproduce the disease.
4. Recover and identify the pathogen from the deliberately infected host.

Transmission

1. Diseases are spread from person to person or by vectors (mosquitoes)
2. Vector-carried infection: insects, arthropods, (flies, roaches, ticks, fleas)
4. Droplet infections: sneezing, coughing, etc
5. Contact infections: chicken pox, tuberculosis, venereal
6. Contamination infections: food, water, Cholera
7. Wound infections: Staph, Strep, from environment
8. Immune carriers: Typhoid Mary

Disease progression

1. Contraction. Exposure to a pathogen.
2. Incubation. The period of time between contraction and symptoms of disease is called the prodromal stage. This is characterized by generalized symptoms.
3. Disease symptoms are specific to that disease. Some diseases have the same symptoms.

Mechanisms of disease

1. Tissue destruction (Pathology)
 - a. Typhoid bacilli. Fecal-oral contamination. Attached to tips of villi, multiply, then penetrate into the mucosa to enter the lymph and blood. High fever, internal scarring, ulceration, and necrosis result.
 - b. Tuberculosis. 'Consumption'. One third of world population. Commonly in lungs, but can be found anywhere. Tissues die and scarring results.
 - c. HIV suppresses or kills T4 cells of the immune system rendering the patient immunologically deficient.
2. Toxin formation
 1. Exotoxins: secreted by pathogens
 - some produced **in** the host
 - some produced in the food before ingestion (food poisoning)
 2. Endotoxins: The pathogen's cell surface is the toxic to the host.
3. Inflammation is the host's response to injury. It initiates a series of steps resulting in swelling of tissues which can sometimes cause more injury.

Tumors

1. An abnormal growth of tissue.

2. Benign tumors: slow and localized growth (moles, warts). Can obstruct or put pressure on delicate areas.
3. Malignant tumors: rapid and spreading growth
4. Biopsy: sample of tissue for examination. diagnose

Cancer

1. Uncontrolled growth. larger and faster metabolism and reproduction.
2. Causes of cancer
 - a) viruses: Hodgkins associated with Epstein-Barr virus.
 - b) carcinogens: smoking, benzene, saccharin
 - c) radiation: sun bathing,
 - d) genetic: oncogenes turn healthy cells into cancer cells.

Aging

1. Gerontology: the study of old age
2. Wearing out of the body, bones, organs, etc.
3. Everyone has cancer at some time: body usually destroys rogue cells, contributes to age
4. Accumulation of wastes in cells
5. Genetic

Death

1. Heart beat, breathing, brain waves
2. EEG: electroencephalogram
3. Clinical death: no brain waves for 24 to 48 hours
4. Heb 9:27 it is appointed unto man to die once and after that the judgment.
5. Separation of soul and body

Reduce risk of disease

1. Wash your hands
2. Keep your hands away from your mouth and eyes.
3. Avoid exposure to infectious people.
4. Disinfect 'hot zones' in your house.
5. Avoid contaminated food prepared incorrectly.
6. Don't share personal items. (Common sense not personal rejection)
7. Get vaccinated
8. Follow instructions when using antibiotics