Chapter – 13

Why Do We Fall Ill?

Health and its Failure

⇒ The state of complete physical, mental and social well-being is term as health.

⇒ To maintain a healthy life, a person needs to have a balanced diet, need to exercise, and get enough sleep. Maintaining good hygiene also reduces the chances of developing an infection.

⇒ The word disease means 'lack of ease' or disturbed ease.

⇒ A healthy person will be disease-free. But a disease-free person can be healthy or unhealthy.

⇒ A doctor is able to diagnose a disease by identifying the symptoms which may be physical, mental, or both.

Disease and its Causes

A disease is a disorder in a human, animal, or plant caused by infection, diet, or by faulty functioning of a process.

♦ *Acute Diseases*:

The diseases which last only for a short period of time are called acute diseases. Their symptoms are quickly visible in the body. Example: Common cold and cough, typhoid, cholera.

♦ *Chronic Diseases*:

The diseases which last for a long time (months, years, or lifelong) are called chronic diseases. Example: Cardiovascular disease, elephantiasis, diabetes, arthritis, tuberculosis, and cancer.

*Note: Acute disease does not cause a major effect on our health while chronic disease causes drastic and long-term effects on our health.

⇒ Types of disease-causing factors:

(a) *Intrinsic Factors*:

The disease-causing factors which exist within the human body are called intrinsic factors. Diseases caused by intrinsic factors are Cardiac failure, kidney failure, sickle cell anemia, diabetes, myopia, cataract, allegories, cancer, arthritis.

(b) *Extrinsic Factors:*

The disease-causing external agents which enter the human body from outside are referred to as extrinsic factors. The important extrinsic factors which affect human health are the following:

- Unbalanced diet and environmental pollutants
- Disease-causing microorganisms such as viruses, bacteria, fungi, protozoans, helminths, worms, etc.

♦ *Congenital disease*:

The disease which is present from birth is called are a congenital disease. They are caused due to genetic abnormalities or metabolic disorders or malfunctioning of any organs. They are permanent, not easily curable, and may be passed on to the children.

♦ *Acquired disease*:

The disease which develops after birth is called acquired disease. It can be broadly classified into two types:

- Infectious or communicable diseases
- Non-infectious or non-communicable disease

Infectious Diseases

⇒ An infectious disease is caused by pathogens (disease-causing microorganisms) such as bacteria, fungi, viruses, protozoans, worms, etc.

⇒ This is also called a communicable disease because it can pass from a diseased person to a healthy person through direct contact or some medium like air, water food, or vectors (insects).

⇒ Some common diseases caused by infectious agents are:

Infectious agents	Diseases
Viruses	Common cold, dengue fever, AIDS, Hepatitis-B, influenza, chicken pox, etc.
Bacteria	Tuberculosis, typhoid, cholera, tetanus, anthrax, etc.
Fungi	Skin infection like ring worms, athlete's foot, etc.
Protozoans	Malaria, Kala-azar, sleeping sickness, etc.
Worms	Intestinal worm infections and elephantiasis.

⇒ Means of the spread of infectious diseases:

(a) Through air – When an infected person coughs or sneezes the droplets are thrown out and when another person breathes in, the microbes may enter into his body. Ex: Common cold, pneumonia, etc.

(b) Through water - These occur when a stool from an infected person gets mixed with the drinking water. Ex: cholera, hepatitis-B.

(c) Through sexual contact - AIDS and syphilis are transmitted by sexual contact from one person to the other. So, they called sexually transmitted diseases. It is not spread by casual physical contact such as handshakes and hugs. AIDS virus can be transmitted through:

- Unprotected sex with an infected person.
- Use of infected needles for injection.
- Blood transfusion contaminated with an AIDS virus.
- From infected pregnant mother to her child.

(d) Through vectors – The animals which spread the disease from an infected person to a healthy person is called a vector. Ex: Malaria, Brain fever, and dengue are transmitted by mosquitoes. Malaria is caused by protozoans which spread through the bite of a female Anopheles mosquito.

Rabies is a deadly virus spread to people from the saliva of infected animals (dogs, cats, monkeys) through a bite.

⇒ The microbes enter from the air via the nose, they are likely to go to the lungs and affect it.

⇒ Influenza is a viral disease of the respiratory tract. It is caused by influenza virus (Mycovirus influenza). The inhaled virus attacks the epithelial cells in the mucous membrane of the nose, throat, and upper respiratory tract. It is spread from one person to another person via sneezing, coughing, and talking.

⇒ Japanese encephalitis is a viral disease that spread through a mosquito bite. It infects the brain and is also known as brain fever.

♦ *Epidemic disease*:

An epidemic disease is the rapid and extensive spread of disease that affects many individuals simultaneously in a particular area. It is generally an infectious disease. Some examples of epidemic diseases are cholera, plague, and Ebola.

Treatment and Prevention

♦ *Antibiotics*:

Antibiotic blocks the bacterial processes that build the cell-wall. As a result, the growing bacteria become unable to make cell walls and die easily. But viruses do not have cell walls so they do not use this pathway that is the reason why antibiotics do not work against viral infections. This is why it is difficult to make anti-viral drugs.

The first antibiotic was penicillin which was developed in 1940 by Alexander Fleming to treat soldiers in Second World War.

*Note: To fight against viral diseases our body secretes an antiviral protein called interferon.

♦ *Immunity*:

The ability of organism to resist a particular infection is called immunity. When our body gets infected, an active immune system recruits many cells to the affected tissue to kill off the disease-causing microbes. This recruitment

process is called inflammation. The effects of inflammation are shown in the form of swelling, pain, and fever.

♦ *Immunisation*:

When the immune system, first encounters an infectious microbe, it responds against it and then remembers it specifically. So, the next time that particular microbe or its close relatives enter the body, the immune system responds with greater vigor. This eliminates the infection even more quickly than the first occurrence of the disease. This is the basis of the principle of immunization.

♦ *Vaccination*:

Vaccination is a technique to develop immunity in individuals without infection. Vaccination is the process of injection of killed or inactivated microbe to trigger the immune system to produce antibodies against a particular disease. Vaccination is available for Tetanus, Diphtheria, Measles, Polio, Cholera, Hepatitis-B, Tuberculosis, Mumps, etc.