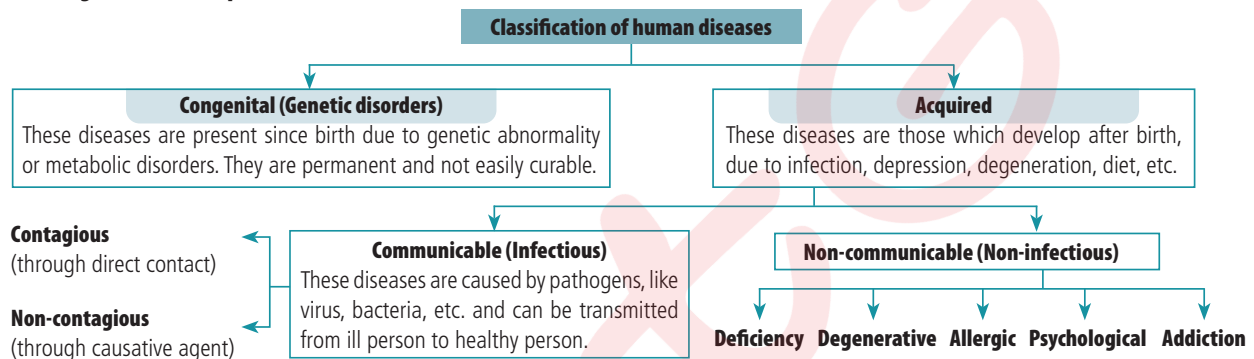


HUMAN HEALTH AND DISEASES

Let Us Enhance Our Learning

COMMON DISEASES IN HUMANS

- The word disease (dis-ease) literally means disturbed ease or discomfort. Diseases that occurs suddenly and last for only short period of time are called **acute diseases**, e.g., cold, typhoid, cholera, etc. **Chronic diseases** last for long period of time even as much as lifetime, e.g. elephantiasis, diabetes, atherosclerosis, arthritis, etc.
- Genetic disorders, infections and lifestyle are some factors which directly affect health and cause diseases.
- Human beings are prone to a wide variety of diseases. These diseases can be broadly grouped into two types : **congenital** and **acquired**.



COMMUNICABLE DISEASES

- Communicable (infectious) diseases are those caused by some biological agents or **pathogens**. These may be viruses, bacteria, protozoans, fungi, helminths, etc. Various communicable diseases are listed in the given tables:

Table : Viral diseases

Disease	Pathogen	Symptoms	Mode of spread	Vaccine/Treatment
Poliomyelitis	<i>Enterovirus</i> (Poliovirus)	Paralysis of skeletal muscle	Faecal oral route	Salk vaccine, OPV (Oral polio vaccine)
Chikungunya	Chikungunya virus	Sudden onset of fever, crippling, joint pain	By bite of <i>Aedes aegypti</i> mosquito	Paracetamol, aspirin
Dengue or break bone fever	<i>Flavi-ribo</i> virus	Sudden onset of high fever, frontal headache, pain behind eyes, muscles and joint pains	By bite of <i>Aedes aegypti</i> mosquito	Bed rest, analgesic and antipyretic medicines, platelet transfusion
Rhinitis (Common cold)	<i>Rhino</i> viruses	Nasal congestion, sore throat, cough, headache, slight fever, etc.	Droplet infection	Antihistamines and decongestants

Table : Bacterial diseases

Disease	Pathogen	Symptoms	Mode of spread	Vaccine/Treatment
Typhoid	<i>Salmonella typhi</i>	High fever, low pulse rate, abdominal pain, frequent stools	Faecal oral route	Terramycin, chloromycetin Detection : Widal test
Pneumonia	<i>Streptococcus pneumoniae</i> and <i>Haemophilus influenzae</i>	High fever, difficulty in breathing due to collection of mucus in alveoli and bronchioles of lungs	Sputum of patient	Penicillin, streptomycin, ampicillin

Cholera	<i>Vibrio cholerae</i>	Frequent stools like rice water, vomiting	Faecal oral route	Oral rehydration therapy, tetracycline, chloramphenicol
Tuberculosis (Koch's disease)	<i>Mycobacterium tuberculosis</i>	Cough, blood containing sputum, pain in chest, loss of appetite, excessive fatigue	Droplet infection	BCG vaccine, isoniazid, streptomycin, rifampicin
Diphtheria	<i>Corynebacterium diphtheriae</i>	Sore throat, hoarseness, difficulty in breathing	Droplet infection	DPT (Diphtheria, Pertussis and Tetanus) vaccine
Whooping cough (Pertussis)	<i>Bordetella pertussis</i>	Whooping sound, face becomes red during coughing, convulsions	Droplet infection	DPT vaccine
Tetanus (Lock jaw)	<i>Clostridium tetani</i>	Spasms of muscles of jaw and face, severe pain	Wound infection	DPT vaccine

MALARIA

- **Malaria** is a fatal disease of human beings caused by a protozoan parasite, *Plasmodium*. It is digenetic; i.e., it has two hosts : **mosquito (*Anopheles*)** is **primary** or **definitive host** where **sexual** stages of the parasite occurs whereas **human being** is intermediate or secondary host where asexual phase of malarial parasite occurs.
- Sir Ronald Ross, a doctor who was born at Almora in India established that malarial parasite is transmitted by bite of female *Anopheles* mosquito. In 1902, he got Nobel prize for this discovery.

LIFE CYCLE OF PLASMODIUM

- Plasmodium* enters the human body as sporozoites through the bite of infected female *Anopheles* mosquito.
- The sporozoites reach the liver through blood where, they reproduce asexually and attack the red blood cells (RBCs) resulting in their rupture.
- The rupture of RBCs is associated with the release of a toxin known as haemozoin, which is responsible for the high recurring fever and the chill/shivering recurring every 3/4 days.

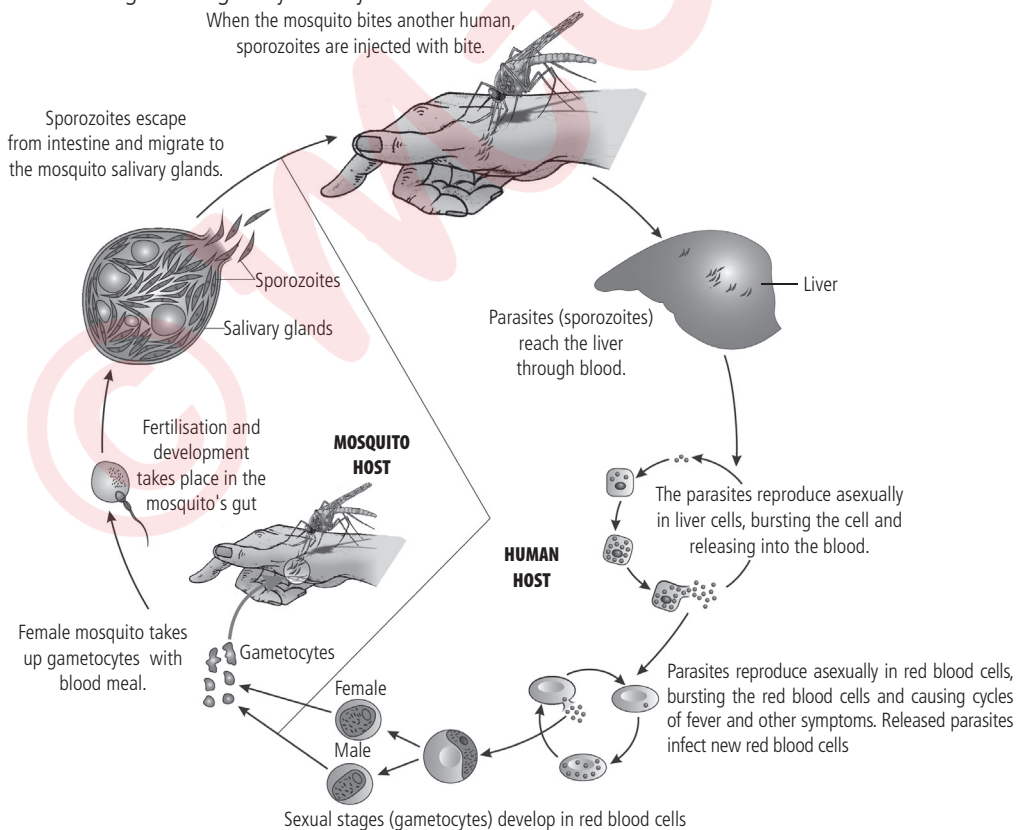


Fig.: Stages in the life cycle of *Plasmodium*

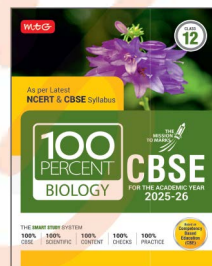
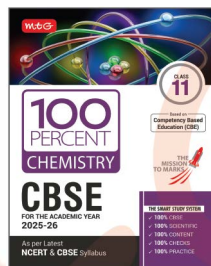
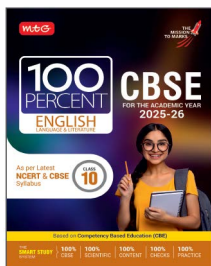
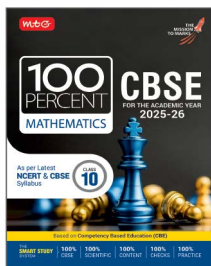
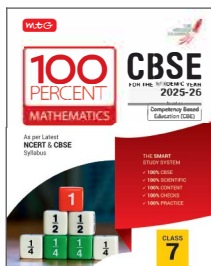
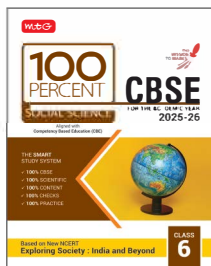
- (iv) Gametocytes (sexual stages) develop in the RBCs of female *Anopheles*.
- (v) The female parasite then enters the mosquito's body along with the blood when it bites the infected person.
- (vi) Further development occurs in stomach wall of mosquito and gamete fuse to form a zygote.
- (vii) Thus, the zygote undergoes further development in the body of the mosquito to form sporozoites.
- (viii) These sporozoites are then transported and stored in salivary glands of mosquito and are transferred into a human body during the bite of the mosquito.

- ➔ **Symptoms :** Influenza like illness, shaking, chills, headache, nausea, diarrhoea and anaemia may occur.
 - ➔ **Treatment :** Drug obtained from *Cinchona* tree bark called **quinine** and its derivatives like chloroquine, primaquine, camoquine, artemisinin from *Artemisia annua* are used to cure malaria.
 - ➔ **Prevention :** Malaria can be prevented by killing mosquitoes by spraying DDT, BHC, etc., and also by using mosquito repellents, mosquito nets, etc.
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