they start multiplying. Patients have relatively few or no signs and symptoms during this initial stage.

- Once the number of bacteria reaches a critical stage, they invade bloodstream and rest of the body. At this stage, signs and symptoms, such as fever and abdominal pain appear. Peyer's patches can get enlarged and necrosed due to mononuclear cell infiltration. Bacteria also reach gallbladder via bloodstream and multiply there. From the gallbladder, bacteria reach the intestine and are excreted in the stool which can spread to others via contaminated foods. Some patients become chronic carriers carrying the bacteria in their gallbladder and are responsible for much of the transmission of the organism. While asymptomatic, they may continue to shed bacteria in their stool for decades.

Clinical Features

- The incubation period averages 10 to 14 days.
- The onset of the disease is insidious, with headache, malaise, anorexia and fever. The fever is continuous (does not touch the baseline) sometimes increasing in a step-like manner (step ladder fever) to reach a peak towards the end of the first week. Thereafter it plateaus and remains for two to three weeks. Accompanying chills are common but frank rigors are rare. Headache is often present.
- Abdominal discomfort with mild bloating and constipation usually occurs, but diarrhea can also occur. Stools may have a 'pea soup' appearance.
- Hepatosplenomegaly may develop by the end of the first week. Mild jaundice may be present.
- The typical rash of typhoid (rose spots) develops in the second week but is seldom seen in Indian patients. 'Rose spots' are macules, 2–3 mm in size, occur in small crops on the chest and abdomen, blanch on pressure and last for 2–3 days.

Investigations

- The diagnostic 'gold standard' for enteric fever is culture of *S. typhi* or *S. paratyphi*. Blood cultures are usually positive in the first week of infection. Cultures of stool and urine may also be positive. Bone marrow culture is highly sensitive and may remain positive even with up to 5 days of antibiotic therapy.
- The Widal test is very helpful in diagnosis. The test is positive, if O antigen titer is more than 1:160. Titres against the flagellar (H) antigen are less specific. Usually it becomes positive after the 1st week of illness.
- Relative bradycardia and leukopenia may be present.
- LFT may show mild elevation of AST and ALT.

Treatment

- Third generation cephalosporins are currently the drugs of choice. Ceftriaxone (1 to 2 g intravenously or intramuscularly) for 10 to 14 days is the treatment of choice in severe typhoid.
- Other antibiotics effective against typoid are ofloxacin, levofloxacin and azithromycin.
- Paracetamol is given to control fever, headache and myalgia.
- Other supportive measures include good nutrition and hydration. Soft and bland diet should be given because of inflamed intestines.
- Some patients become chronic carriers of typhoid bacilli. They can be a source of infection to others. Carrier state can be treated with oral amoxicillin or trimethoprim-sulphamethoxazole or ciprofloxacin. Antibiotics should be given for 6 weeks.

Complications

- Complications are uncommon now due to availability of effective antibiotics.
- *Intestinal bleeding:* Erosion of blood vessels in necrotic Peyer's patches or in the intestinal wall can initiate bleeding.

- ***Latent syphilis:*** Early latent syphilis is treated in the same way as primary syphilis. Late latent syphilis is treated with 2.4 million units of benzathine penicillin given IM once a week for three weeks.
- ***Tertiary syphilis:*** Treatment for gummatous and cardiovascular syphilis is the same as that of late latent syphilis. Neurosyphilis should be treated with intravenous penicillin G (3 to 4 million units IV Q 4h for 10 to 14 days) followed by benzathine penicillin 2.5 million units deep IM once a week for 3 weeks. Cetriaxone 2 g daily IV or IM for 10–14 days is an alternative.
- ***Congenital syphilis:*** A single dose of 50,000 units of penicillin per kg should be given.

Q. VDRL (venereal disease research laboratory) test.

- VDRL is a nontreponemal antibody test to diagnose syphilis. It is quite sensitive but not very specific for syphilis. VDRL is reactive in 78% of patients with primary syphilis. It becomes positive within 4 to 6 weeks after infection or 1 to 3 weeks after the appearance of the primary lesion. Thus, these tests can be negative in early syphilis. VDRL can also be negative in some untreated patients in late syphilis. Hence, VDRL cannot be relied on for diagnosis in very early or late stage of syphilis.
- False positive VDRL test can occur in infections (TB, HIV, Lyme disease, infectious mononucleosis, malaria), pregnancy, connective tissue diseases, liver disease, and malignancy.
- Because of frequent false positive and false negative VDRL test, all positive tests and and all negative tests in patients in whom syphilis is strongly suspected clinically, should be verified by a specific treponemal test.
- The nontreponemal tests are quite useful for monitoring the patient's response to treatment, because the titers reflect disease activity.

Q. Discuss the transmission, pathogenesis, clinical features, investigations and management of human immunodeficiency virus (HIV) infection (AIDS).

Q. Enumerate the AIDS (acquired immunodeficiency syndrome) indicator conditions.

Q. Opportunistic infections in AIDS.

- Human immunodeficiency virus (HIV) is a single-stranded RNA virus belonging to retroviridae family. It is spherical in shape and has a lipid membrane lined by a matrix protein that is studded with glycoprotein (gp)120 and gp41 spikes surrounding a cone-shaped protein core. The core contains two copies of the single-stranded RNA genome and viral enzymes.

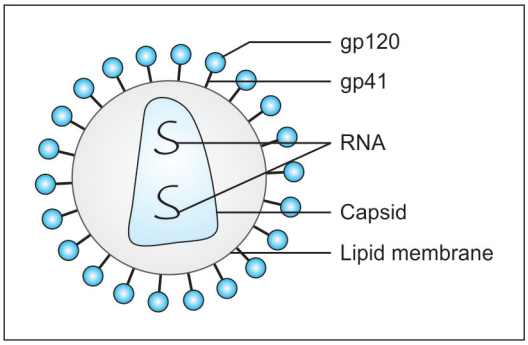

Fig. 1.3: HIV

- HIV infection leads to AIDS (acquired immunodeficiency syndrome), a condition in which the immune system begins to fail, leading to life-threatening opportunistic infections. Immune deficiency is due to destruction of CD4 lymphocytes. Most of the AIDS cases are caused by HIV-1. HIV-2 causes a similar illness to HIV-1 but is less aggressive and is seen mainly to western Africa.
- AIDS was first recognized in the United States in 1981 in male homosexuals. Since

should be given 2 mg/kg ZDV syrup orally four times daily for the first 6 weeks of life, beginning at 8–12 hours after birth.

Prevention of Person-to-Person Transmission

- Precautions regarding sexual practices and injection drug use.
- Universal screening of donor blood and blood products for HIV.
- Infection control practices in the health care setting.
- Vaccines are under development.
- Post-exposure prophylaxis, if there is accidental exposure to a known source of HIV.

Q. Post-exposure prophylaxis (PEP) for HIV.

- *Immediate decontamination*: Wash the area with soap and water. Small wounds and punctures may be cleansed with an antiseptic such as alcohol, iodophors, or chlorhexidine. For mucous membrane exposure, irrigate the area with water or sterile saline.
- *Testing of source of exposure:* Voluntary testing for HIV antibody, hepatitis C virus antibody, and hepatitis B surface antigen (HBsAg); if HIV test is positive, confirmatory Western blot and CD4 count. If the source patient's rapid HIV test is negative but there has been a risk for HIV exposure in the previous 6 weeks, plasma HIV RNA testing is recommended.
- *Testing of exposed person*: Testing for HIV antibody, HCV antibody, HbsAg, and hepatitis B surface antibody (HBsAb); in females of child-bearing age, pregnancy testing.
- *Recommended regimen*: Three-drug PEP regimens are now the recommended regimens for all exposures due to the safety and tolerability of new HIV drugs. The preferred 3-drug PEP regimen is as follows: **Tenofovir (TDF)** combined with either **lamivudine (3TC)** or **emtricitabine (FTC)** as preferred backbone drugs. The recommended third drug is **raltegravir** 400 mg PO twice daily. The duration of treatment is 28 days.
- PEP should be initiated as soon as possible, ideally within 2 hours of exposure; a first dose of PEP should be offered to the exposed worker while the evaluation is underway.
- Repeat HIV testing should be done at 4 and 12 weeks post-exposure.

Q. Herpes simplex.

Herpes simplex viruses are ubiquitous and cause a wide variety of diseases. There are two types: Herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2). HSV-1 usually causes gingivostomatitis, herpes labialis, and herpes keratitis. HSV-2 usually causes genital lesions.

Pathogenesis

- Transmission of HSV results from close contact with a person who is actively shedding virus.
- After the initial infection, HSV remains dormant in nerve ganglia, and can get activated during stress such as febrile illness, overexposure to sunlight, physical or emotional stress, immunosuppression, etc.

Diseases Caused by Herpes Simplex

- **Herpetic gingivostomatitis:** It is usually caused by HSV-1, typically in children. Rarely HSV-2 can also involve gingiva and oral cavity through oral-genital contact. Lesions consists of clusters of small vesicles on an erythematous base. Leisons are usually painful and after a few days, rupture leaving behind yellowish crust. Healing occurs 8 to 12 days after onset. Local infection can spread systemically in immunocompromised patients. After resolution, the virus resides dormant in the trigeminal ganglion and can get reactivated later.
- **Herpes labialis:** It is usually a secondary outbreak of HSV. It develops as ulcers (cold sores) on the lip or as ulcerations of the mucosa of the hard palate.

Other Laboratory Findings

There may be anemia, increased WBC count, neutrophilia, and increased ESR. In severe falciparum malaria, there may be metabolic acidosis, increased bilirubin, elevated liver enzymes, thrombocytopenia, increased urea, creatinine, and hypoglycemia.

Treatment

Chloroquine-sensitive Strains

- Chloroquine **or** Amodiaquine for 3 days.
- In addition to above, primaquine should be given for 14 days to prevent relapse in vivax malaria.

Severe Falciparum Malaria

Artesunate **or** artemether **or** quinine injection.

Supportive Measures

Include IV fluids, antipyretics, blood transfusion to correct severe anemia, and bed rest.

Prevention of Malaria

Decreasing the Mosquito Population

- Spraying of insecticides
- Biological methods such as use of mosquito larva eating fish in water reservoirs.

Personal Protection

Use of clothes extending up to the wrists and ankles when outdoors and mosquito nets when indoors to avoid mosquito bites. Application of insect-repellant creams on the exposed body surfaces like legs and hands.

Chemoprophylaxis

- Recommended for nonimmune visitors to endemic areas and to pregnant women living in endemic areas.
- Travelers should start taking antimalarial drugs at least 1 week before visiting the area and continue for 4 weeks after returning from the endemic area.
- Chloroquine 500 mg per week or mefloquine 250 mg orally per week or doxycycline 100 mg orally once daily can be used for prophylaxis.

Malaria Vaccine

Efforts are under way to develop a vaccine against *P. falciparum*.

Complications of Malaria

Complications usually happen in severe falciparum malaria. These are:

- Cerebral malaria
- Renal failure
- Acute respiratory distress syndrome (ARDS), and respiratory failure
- DIC (disseminated intravascular coagulation)
- Hemoglobinuria
- Jaundice