
بسم الله الرحمن الرحيم

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قَالُوا سُبْحَانَكَ لا عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

(البقرة:الاية 32)

ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)

By

Staff Members of Tropical Medicine and Gastroenterology

Presented by

Dr. Hammam AbuEl Alameen

Lecturer of Tropical Medicine and Gastroenterology

Sohag Faculty of Medicine

ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)

Agenda:

- Definition
- History
- Types of the virus
- Risk groups
- Modes of transmission
- Pathogenesis
- Clinical picture and stages of HIV infection
- Diagnosis
- Treatment and prevention

ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)

- **Definition** :

  AIDS actually refers to end stage manifestations of a long standing infection with a retrovirus HIV.

- **Cause**:

  It is Caused by infection with Human Immunodeficiency Virus (H.I.V) which is a Lentivirus, a subgroup of retroviruses. These have the ability to transcribe their RNA genome to DNA one.

How did the HIV virus originate?

- Origin of virus is not yet certain.
- Evidence suggest that it existed in **chimpanzees** in West Africa and then infected humans possibly through a bite or scratch from a chimpanzee and from there it may have spread into a wider population.

History:

- **In 1981,** cases of a rare lung infection called **Pneumocystis carinii pneumonia (PCP)** were found in five young, previously healthy gay men in Los Angeles.
- At the same time, there were reports of a group of men in New York and California with an unusually aggressive cancer named ***Kaposi's Sarcoma*.**
- **In December 1981,** the first cases of PCP were reported in people who inject drugs.
- **By the end of the year,** there were 270 reported cases of severe immune deficiency among gay men - 121 of them had died.

- **In June 1982,** a group of cases among gay men in Southern California suggested that the cause of the immune deficiency was sexual and the syndrome was initially called gay-related immune deficiency (or GRID).
- **Later that month,** the disease was reported in haemophiliacs and Haitians leading many to believe it had originated in Haiti.
- **In September,** the CDC used the term 'AIDS' (acquired immune deficiency syndrome) for the first time, describing it as

Types of the virus

- **There are 2 types of HIV**

- **HIV-1 :** predominant in America and Europe and is more aggressive.
- **HIV-2:** predominant in central Africa (carrier rate is about 30%).

Risk groups

1. **Homosexuals and heterosexuals**
2. **IV drug abusers,**
3. **addicts**
4. **Hemophilics**
5. **Blood transfusion recipients**

Modes of transmission :

1. **Sexual intercourse**: homosexual or heterosexual intercourse (anal, vaginal)
2. **Contaminated blood and blood products: -** Blood transfusion. Blood products e.g. factor VIII.
3. **Contaminated needles and syringes.**

Modes of transmission :

4. Mother to Child (vertical transmission):

- In utero.
- During childbirth.
- Breast milk.

5. Organ and tissue donation:

- Semen.
- Kidney, skin, and corneas.
- Bone marrow.

- **Sweat, urine, saliva and tears** are non-infectious under ordinary circumstances because the virus is hardly detected in these fluids.
- There is no evidence that HIV is spread by social or household contact nor by blood-sucking insects such as mosquitoes and bed bugs.

Pathogenesis:

The manifestations of HIV disease are related to progressive destruction of the immune system (mainly T-helper cell or CD4) or direct viral effect (CNS).

The virus has a characteristic cytopathic tropism for lymphocytes (mainly T-helper cells).

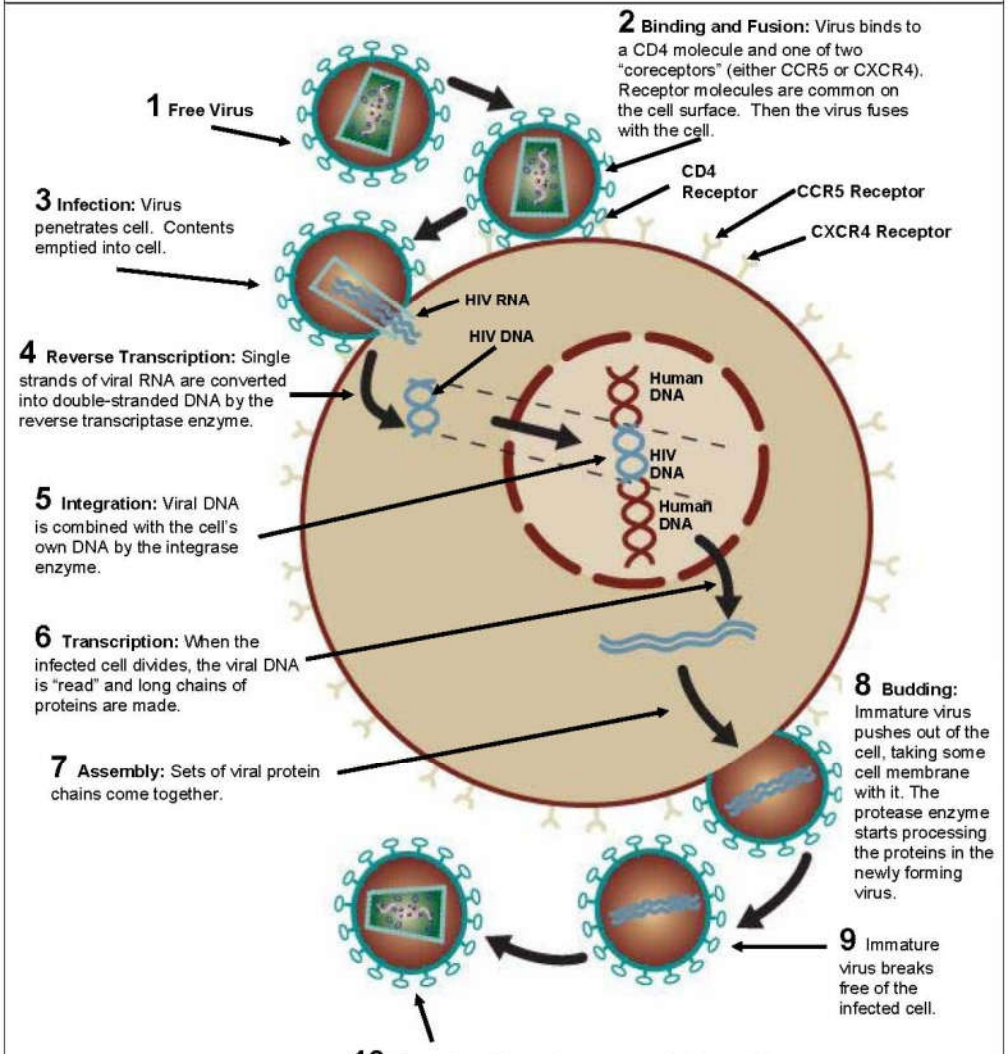
- Once the virus enters a cell, HIV can replicate & cause cell fusion or death by unknown mechanism .

Pathogenesis:

- In many cases, a latent state is established with integration of the HIV genome into the host cell genome .
- With increasing duration of infection, The number of CD4 Lymphocytes fall and with abnormal function.
- Other defects in the immune system includes infection of B-lymphocytes & macrophages .

AIDS InfoNet www.aidsinfonet.org Fact Sheet Number 106

HIV LIFE CYCLE



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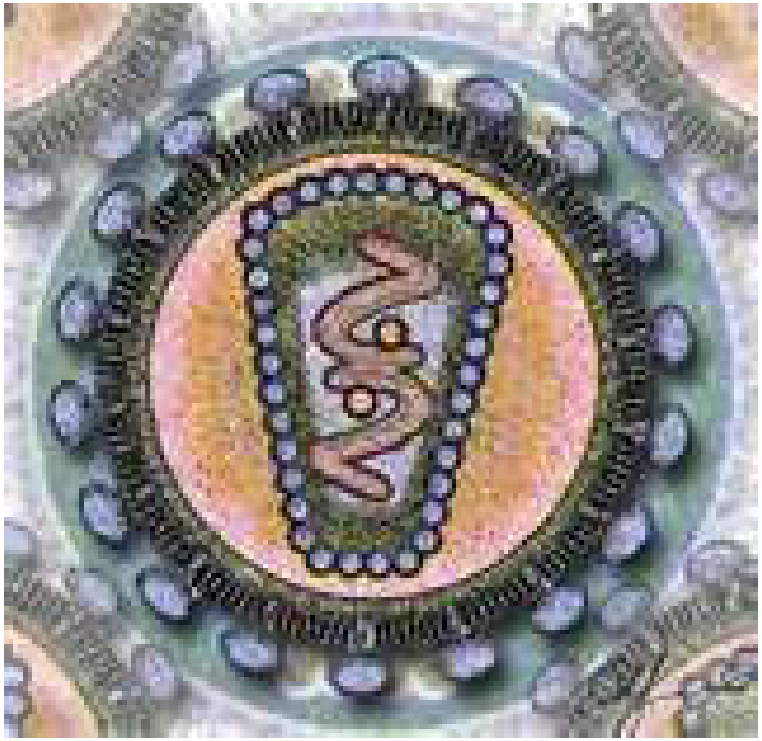
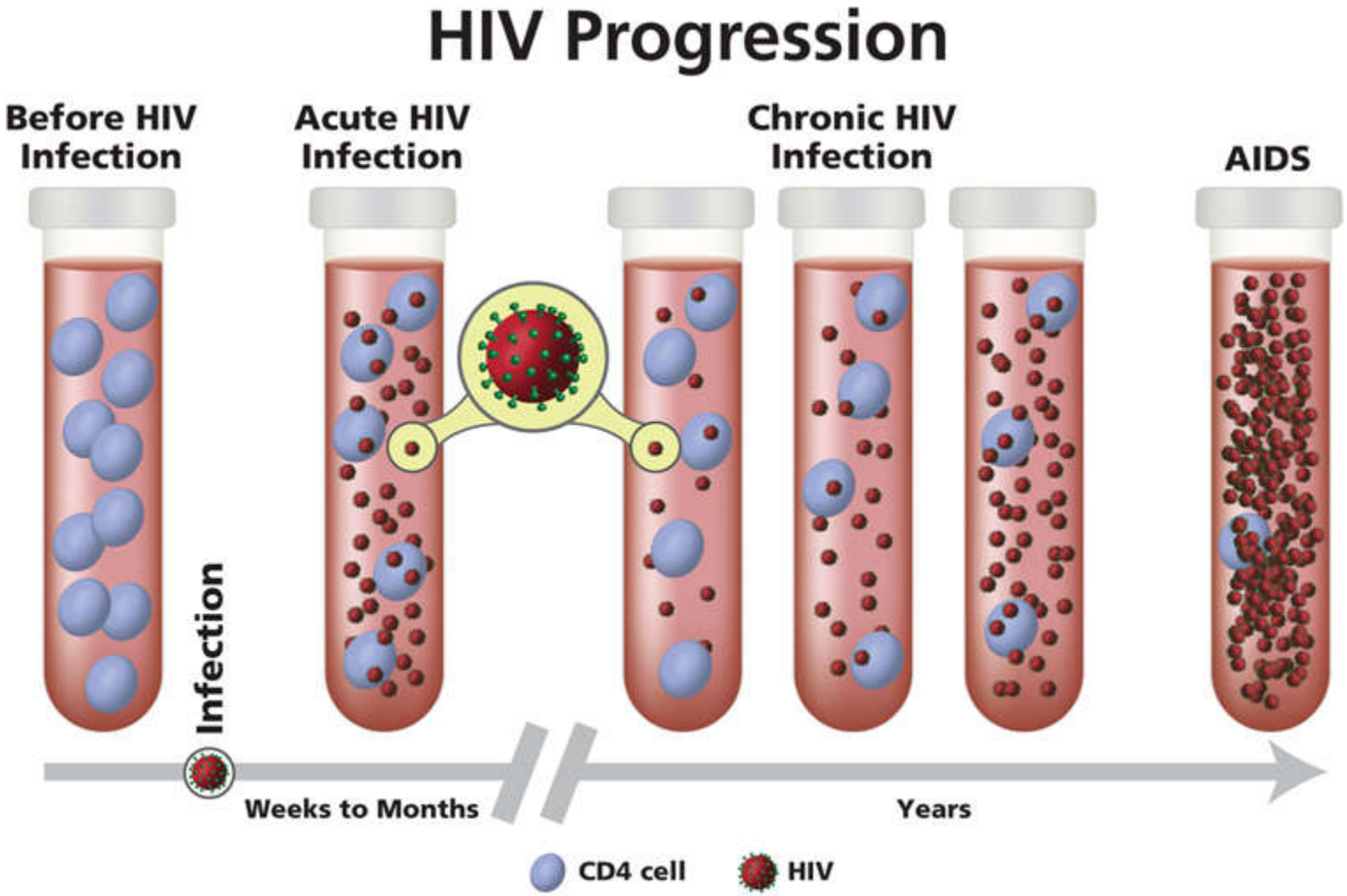
Fact Sheets can be downloaded from the Internet at http://www.aidsinfonet.org



The mature virus

Stages of HIV infection

- There are three stages of HIV infection:
- (1) acute HIV infection, (2) chronic HIV infection, and (3) acquired immunodeficiency syndrome (AIDS).


HIV Progression
Before HIV Infection
Acute HIV Infection
Chronic HIV Infection
AIDS
Infection
Weeks to Months
Years
CD4 cell
HIV

Clinical picture

Early stage infection

1- (Group I): Acute infection after 3-6 weeks incubation period. usually transient.

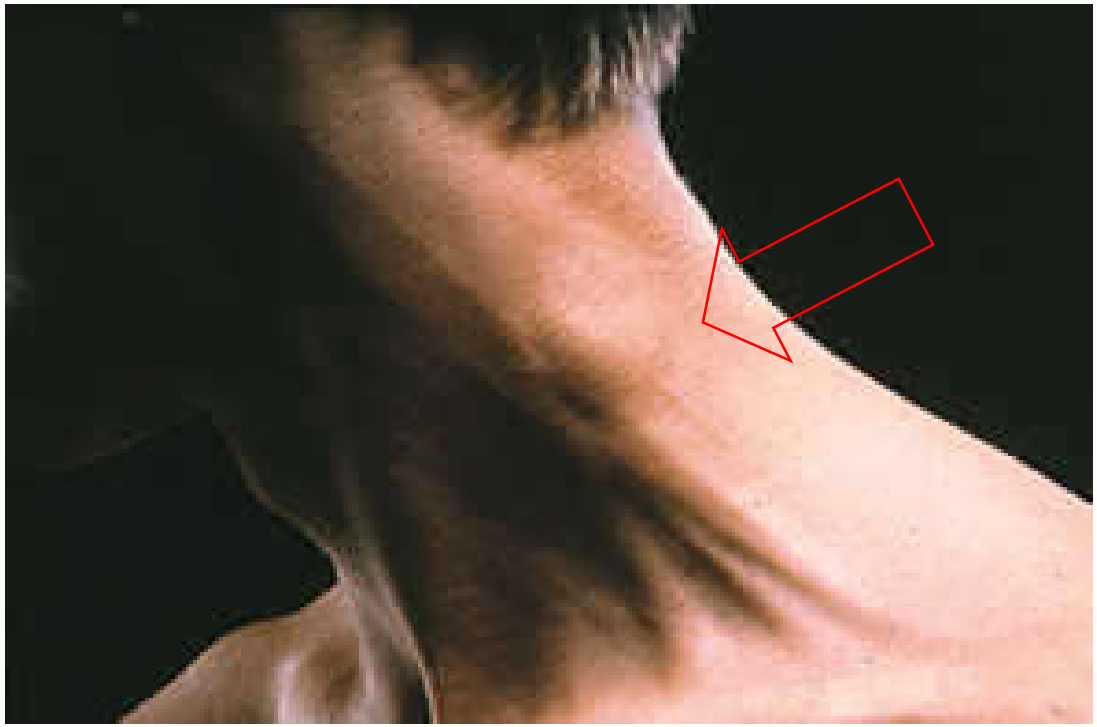
- The earliest clinical presentation may be symptoms are of **a glandular fever or flu-like illness** with a sore throat, malaise, fever, maculo-papular rash.
- Lymph node enlargement, diarrhoea, arthralgia
- Occasionally encephalopathy, neuropathy or meningitis.

2- Group II: Asymptomatic infection.

Symptoms and signs usually resolve, and patients enter a prolonged phase in which they may remain asymptomatic but are potentially infectious.

3- Group III: Persistent generalized lymphadenopathy; after 3 to 10 years.

There is an insidious and variable progression, in which there is lymph node enlargement, tonsillar enlargement, episodes of unexplained fever.



Painless lymph node enlargement in HIV infection.

Advanced HIV diseases

4- Group IV: Other diseases, usually after 11 years.

- **Conistitutional:**

  Major constitutional symptom complexes

  These include malaise, fever, night sweats, arthralgia, diarrhoea and weight loss

- **Neurological involvement:**

  Myelopathy and peripheral neuropathy, for which the only explanation is HIV infection.

- **Opportunistic infections**

Opportunistic infections

- *Pneumocystis* pneumonia (PCP)
- Chronic cryptosporidiosis
- Toxoplasmosis
- Extra-intestinal strongyloidiasis
- Isosporiasis
- Cryptococcosis
- Candidiasis (oesophageal, bronchial, pulmonary)
- Histoplasmosis
- Mycobacterium avium intracellulare or M kansasii
- Cytomegalovirus
- Herpes simplex

- Secondary cancers:

- Kaposi’s sarcoma.
- Non-Hodjkin’s lymphoma.
- Primary cerebral lymphoma.

HIV-Related Malignancy

Kaposi's Sarcoma

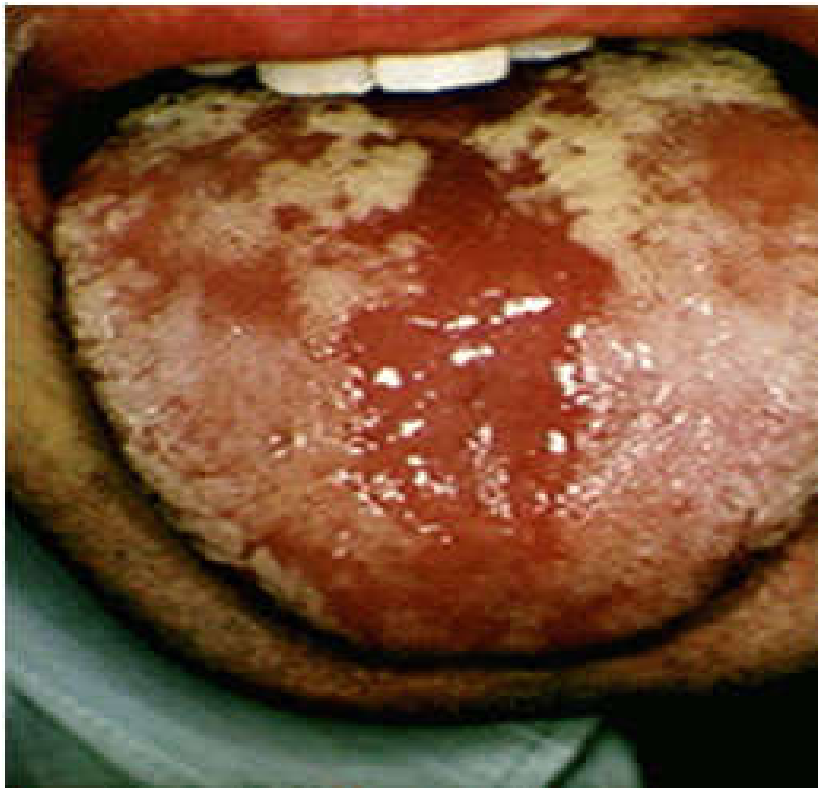
Non-Hodgkin's lymphomas

Primary cerebral lymphoma

Manifestations and effect of HIV on different body systems

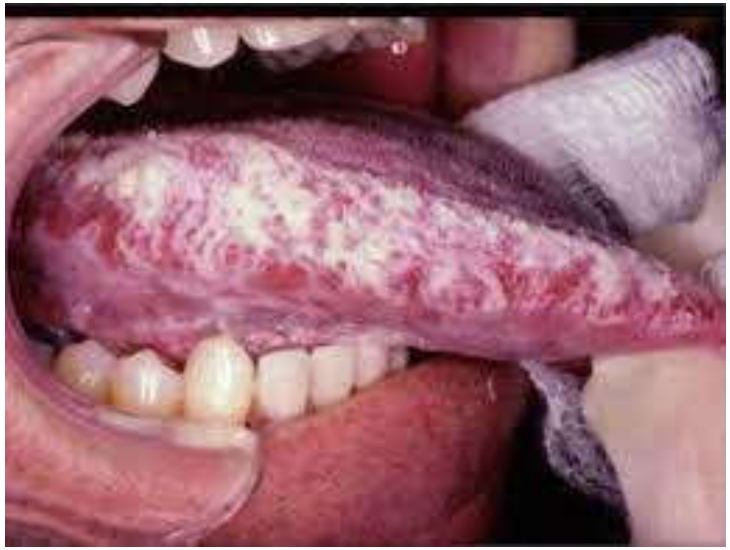
1- GIT manifestations:

- **Mouth:**
  - Oral candidiasis.
  - Hairy leukoplakia:
  - Recurrent painful oral ulcers (due to Herpes simplex virus).
  - Papilloma and condylomata (due to Human paiplloma virus).
  - Kaposi's sarcoma.
  - Lymphoma.

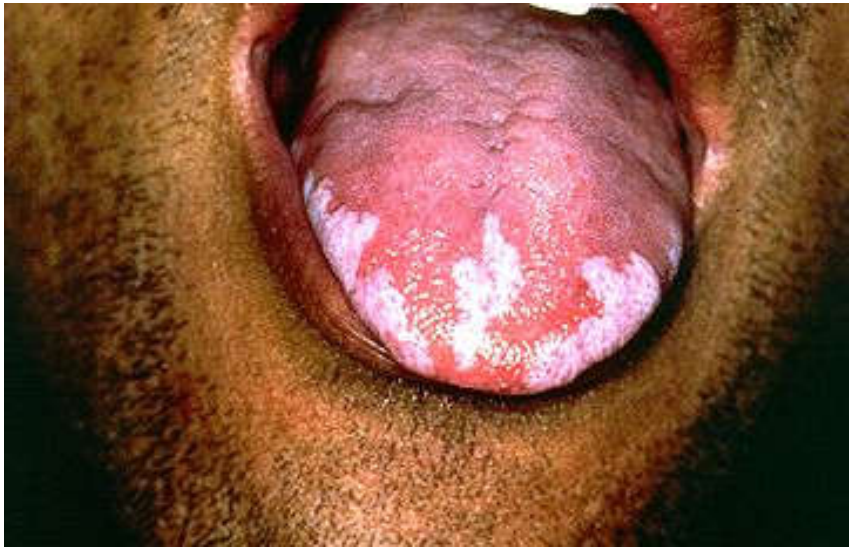


Extensive oral infection with Candida albican in a patient with HIV infection.

Hairy leukoplakia in HIV



Hairy leukoplakia in HIV



Hairy leukoplakia is specific for HIV. It is asymptomatic whitish lesions found on lateral margin of the tongue.

1- GIT manifestations:

- **Oesophageal:**

  -Infectious esophagitis (Candidiasis, Herpes infection, CMV infection.) dysphagia and odynophagia

- Ulceration.
- Leukoplakia.
- Kaposi's sarcoma.
- Lymphoma.

1- **GIT manifestations:**

- **Gastric:**

  - Reduced acid secretion.
  - Reduced gastric juice volume.
  - Reduced pepsin output.

The cause of gastric lesions may be **infections** as cytomegalovirus, campylobacter pylorides, cryptosporidium **or neoplasms** as Kaposi;s sarcoma.

1- GIT manifestations:

- **Intestinal manifestations: (**AIDS enteropathy):

- Direct HIV infection to intestinal immune system leading to secretory diarrhea.
  - Partial villous atrophy.
  - Autonomic neuropathy.
  - Bacterial colonisation
  - Parasitic infestation (cryptosporidium, Giardia lamblia, Isospora belli, E. Histolytica).

2- Chest manifestations:

- **Pneomcystis pneumonia (PCP):**
- Pneumocystis pneumonia (PCP) is caused by Pneumocystis jirovecii.
- The taxonomy of the organism has been changed; Pneumocystis carinii now refers only to the Pneumocystis that infects rats, and P. jirovecii refers to the distinct species that infects humans.
- It is a ubiquitous fungus widely distributed in animals.

2- Chest manifestations:

- **Pneomcystis pneumonia (PCP):**

The presenting feature in 50% of HIV cases.

- Fever, malaise, fatigue, non productive cough, dyspnea.
- Auscultation of the chest often normal.
- X-ray shows bilateral diffuse shadows.
- The diagnosis is by transbronchial biopsy or lavage and examination using silver staining technique.
-

- **Polymerase chain reaction (PCR)** is an alternative method for diagnosing PCP.
- Trimethoprim-sulfamethoxazole (TMP-SMX) (also named **Co-trimoxazole**) is the recommended prophylactic agent for PCP and also for treatment.

2- Chest manifestations:

- **Bacterial pneumonia:**

Caused by streptococcus, staphyococcus aureus,

Mycobacterium tuberculosis,

Mycobacterium avium intracellulare.

- **Others:** as cytomegalovirus, candida, Kaposi's sarcoma, and lymphoma.

2- Chest manifestations:

- **Mycobacterium tuberculosis:**

Main features of TB in HIV:

- Most cases are due to reactivation.
- Extra pulmonary TB is common.
- TB may accelerate HIV disease.
- Tuberculin test is mostly negative (anergy).
- 6-9 months therapy is recommended but INH prophylaxis should continue for life to prevent relapse.

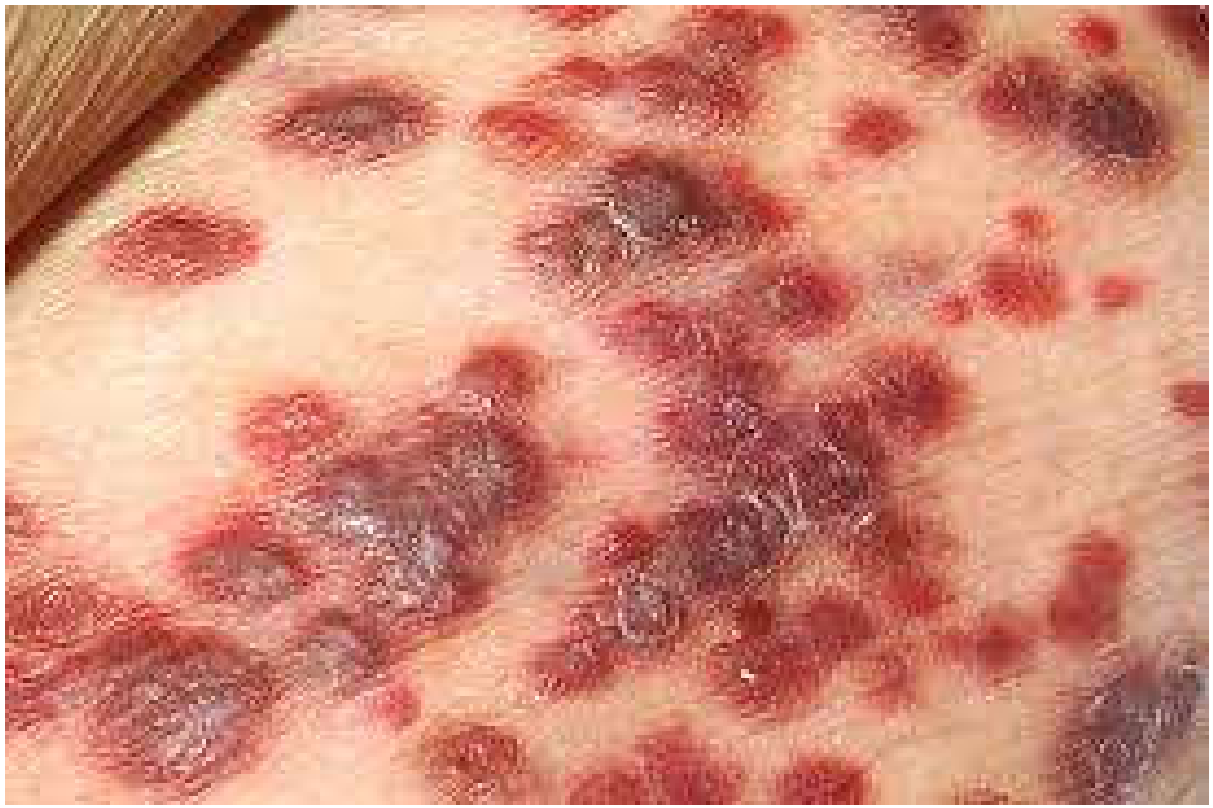
3- Neurological manifestations:

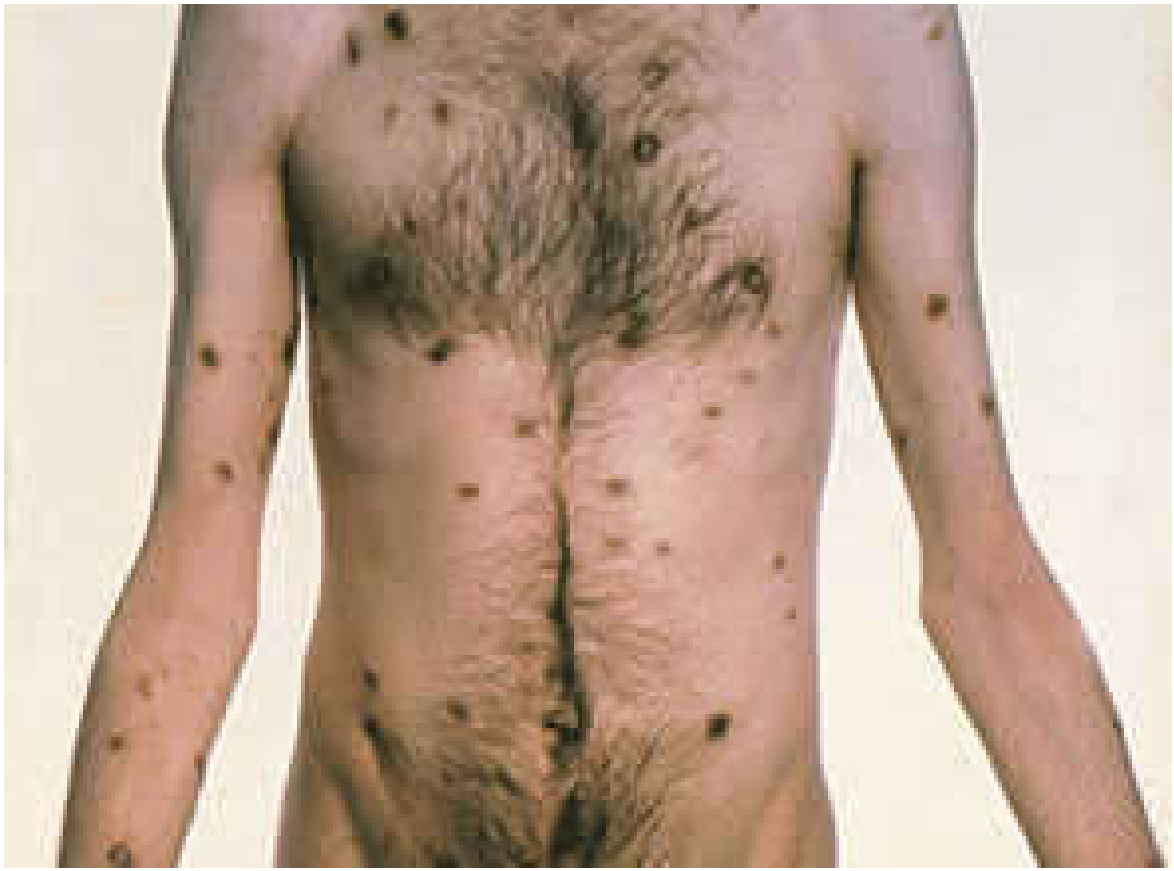
-Encephalopathy: caused by direct HIV infection of the brain).

- Myelopathy and acute transverse myelitis.
- Neuropathy: mostly peripheral sensory neuropathy.
- Encephalitis
- Meningitis: most commonly caused by cryptococcus neophormans.
- Toxoplasmosis.
- CNS lymphoma.

Kaposi's sarcoma

- Kaposi's sarcoma: Common tumor in AIDS patients. It develops as multiple, small dusky purple-red or purple nodular, painless lesions of the skin or buccal mucosa, but may also be found anywhere in the gastrointestinal tract or bronchial mucosa.

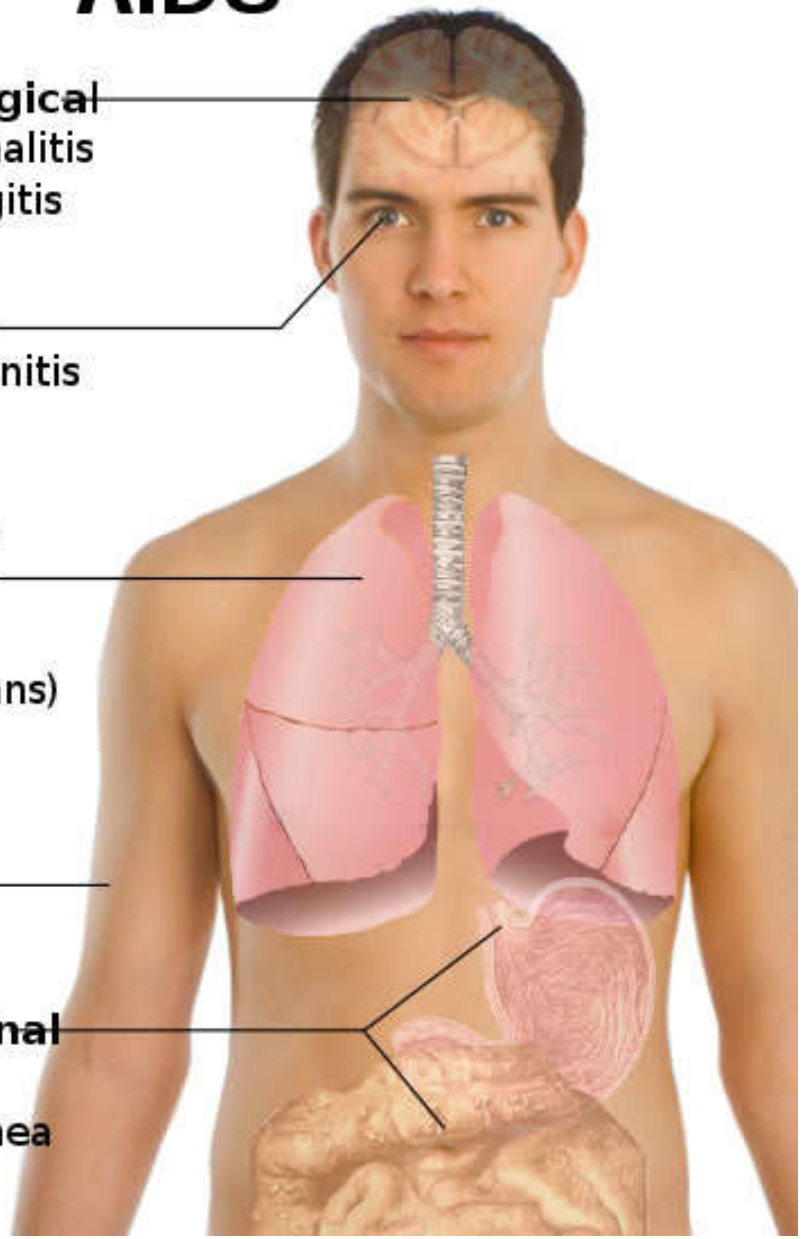




Kaposi's sarcoma is a common complication in patients with AIDS (25% of cases).

Main symptoms of

AIDS



Neurological
- Encephalitis
- Meningitis

Eyes
- Retinitis

Lungs
- Pneumocystis pneumonia
- Tuberculosis (multiple organs)
- Tumors

Skin
- Tumors

Gastrointestinal
- Esophagitis
- Chronic diarrhea
- Tumors

Diagnosis:

A) Clinical suspicion:

- The presence of at least 2 major symptoms and at least 1 minor symptom
- **Major symptoms include:**

1- Unexplained fever for more than 1 month.

2- Unexplained diarrhea for more than 1 month.

3- Unexplained weight loss greater than 10% of previous weight.

- **Minor symptoms include:**

1- Presence of maculopapular rash.

2- Persistent oral candidiasis.

3- Herpes zoster.

4- Aggressive uncontrolled herpes simplex.

5- Unexplained cough for more than 1 month

6- Enlarged lymph nodes in more than one extra-inguinal site.

B) Laboratory

- **CBC which shows** anaemia, neutropenia,

  thrombocytopenia are common with advanced HIV infection, lymphopenia especially T cells, ↓CD4 /CD8 ratio. Decrease CD 4 count less than 400/mm^3. Patients with count less than 200 /mm^3 are at very high risk.

- **HIV ELISA : a screening test for HIV**

  Sensitivity > 99.9%. To avoid false positive results repeatedly reactive results must be confirmed by **Western blot technique.**

- **Polymerase chain reaction (PCR):** is very specific for DNA replication and confirm the infection by HIV.

Treatment :

- Anti retro viral drugs:

- **reverse transcriptase inhibi**tors

 - Nucleoside analogues as →Zidovudine (AZT), Lamivudine.

 - Nonnucleoside analogues as nevirapine

- **Protease inhibitors** as saquinavir, indinavir.

- Ganciclovir: is the drug of choice for CMV infection.

- **Acyclovir:** for herpes simplex virus infection topically, orally or intravenously.
- **Desciclovir** (acyclovir analogue) for therapy of hairy leukoplakia.
- **Anti protozoal.**
- **Anti fungal.**
- **Anti TB.**

Prevention:

Prevention of the spread of HIV infection involves:

1- Screening of blood donors,

2- Advice on safer sexual practices,

3- Measures to curtail intravenous drug abuse and the provision of sterile syringe and needle


Thank You