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## AIDS AND THE SURGEON

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#### **Etiological agent**

HIV disease results from infection with the human immunodeficiency virus type I (HIV-I) which is a member of the slow virus (Lentovirus) family of retroviruses. Lentovirus family consists of 2 subtypes, namely: HIV-1 (most common cause of the disease throughout the world) and HIV-2. They are RNA-coded viruses and consist of an RNA core adjacent to an enzyme (reverse transcriptase) that produces RNA-coded DNA in the host cell. The cell surface receptor (gp-120) recognizes CD4 helper T lymphocytes. HIV infection produces a functional impairment of CD4 lymphocytes creating disorder of antibody production, delayed hypersensitivity and macrophage dysfunction.

#### **Stability of HIV:**

- The virus is fragile and susceptible to physical and chemical agents.
- It is inactivated by heat and gets destroyed after 30 minutes of exposure to heat.
- It is stable at low temperature and may last up to 7-10 days at 4°C.

#### **Natural history of HIV disease.**

Following infection by HIV I virus, there is an initial acute rise in the level of viable virus in the circulation reaching the top nearly at 5 months after exposure which is characterized by acute illness, flu like symptoms and lymphadenopathy which is followed by a sharp fall in viral level reaching the lowest at 12 months after exposure. Then the level remain steady until 36 months, at that time the patient feels well but has a progressive decline in the CD4 lymphocyte count. After that, the viral level start to increase reaching maximum level at 84 months when the patient passes from a subclinical immune dysfunction until reaching a state of complete systemic immune deficiency with all signs of clinical phases of the disease. It is expected that 25-35% of infected patients will develop aids within 2 years if left untreated and the mortality rate is thought to be 100%.

Knowing the life cycle help to eliminate the virus

- Each point in the life cycle is a potential target for treatment.
- Unless the HIV life cycle is interrupted by treatment, the infection spreads throughout the body.

Presently available medicines are blocking the multiplication at two enzyme level, reverse transcriptase and protease. Such therapy is capable of inhibiting all detectable viral replication and clearing the virus from blood and lymph nodes.

The likelihood at developing AIDS has been reduced by (HAAT) therapy- (highly active antiviral therapy). A low CD4 count is the best guide to early clinical events or death within the new future, whereas the plasma viral lad is the best long term guide to prognosis which is likely to be related to whether the patient has a further antiviral treatment options available.

The progress of the disease has been classified by the US centres for disease control (CDC) as shown in table I.

Group	Description
I	Acute infection
II	Asymptomatic infection
III	Persistent generalized lymphadenopathy
IV	Constitutional disease.
Sub group	
A	Neurological disease
B	Secondary infectious diseases.
C	Specified secondary infectious disease listed in the CDC surveillance definition of Aids
Category C-1	Other specified secondary infectious diseases
Category C-2	Secondary cancers, including these within the CDC surveillance definition of aids.
D	Other diseases
E	Other conditions

Table I: CDC classification of HIV disease.

### Prevalence

More than 40 million people world wide have been infected by HIV-1 by 2001, and 3 million deaths in the same year, 0.3-0.6% of population of Asia, Europe & America, 2.2% Caribbean, 8.8% Africa are affected.

### Route of transmission

1. Sexual transmission, homosexual and heterosexuals in anoreceptive intercourse.
2. Blood & blood product transfusion especially hemophiliac receiving factor VIII prepared from HIV infected patient.
3. Maternal fetal transmission: infected mother to fetus during pregnancy and during child birth.
4. Drug addicts when using contaminated needles.
5. Transmission by other body fluid. The body wastes of the patients should be handled universal precaution.
6. Occupational transmission: Mainly the risk of transmission of HIV disease from the patient to the surgeon and health care workers:

A- Surgeon: Blood is the most infective media for HIV transmission; the surgeon has greater risk than other doctors. Infectious patient includes: 1. Unknown cases; recent seroconversion cases which are unknown to have the disease and they are the most dangerous. 2. Proved HIV positive patients. 3. High risk patients which includes; homosexual life style, IV drug abusers, hemophiliac patients, Sahara Africa residency and their partners.

The extent of transmission to the surgeon depends on: 1. The prevalence of HIV infection in the patient population. 2. Number of procedures carried by the surgeon. 3. Length of the period at risk.

The main sources of infection to the surgeon are; contaminated needles, instruments and pack of blood.

B- Health care workers; are usually infected by skin perforation with a hollow needle contains HIV infected blood.

## Precautions

A. The risk of cross infection to the surgical team can be reduced by the use of universal precautions:

1. All staff must be aware of the high risk patients.
2. Keeping invasive tests to minimum.
3. Keeping assistants to minimum.
4. The use of disposable endotracheal tube & anesthetic circuit.
5. Wearing safety spectacles or face mask ( eye protection goggles).
6. Disposable water proof gown & special boots.
7. Two pairs of gloves.
8. Vaccination against hepatitis B.

B. The most important operative precaution is to carry out the procedure in orderly manner:

1. Less assistants.
2. Less movements.
3. Slow handling of instruments.
4. Meticulous haemostasis.
5. Avoid sharp instruments.
6. Using the dishes for passing the surgical instruments.
7. Using forceps & non touch technique.
8. Using staplers whenever possible.
9. Cutting needles before tying sutures.
10. All disposable sheets, cloth, gloves, sanitary towels, tooth brushes & razors must be incinerated.
11. Contaminated tables & floors must be cleaned with house-hold bleach freshly diluted & applied for 30 minutes.
12. Preferring laparoscopic surgery to open one whenever possible.
13. Patient should be first on the operation list.

### Surgeon contamination

If contamination occurred with contaminated blood the procedure should be:

1. Clean contaminated area by running water & soap immediately.
2. One hour post injury prophylaxis by zidovudine 250 mg b.d., lamivudine 150 mg b.d and indinavir 800mg t.d.s.
3. Hepatitis prophylaxis.
4. HIV test-base line test, and repeated every twelve week. If HIV positive test occurred, They should change the work & duties.

\* Infection of the patients by the surgeons: during dental procedure / and other minor surgical procedures.

## Laboratory diagnosis

The disease is diagnosed by either by direct detection of HIV or demonstrating HIV antibodies in the plasma which consist of two types of tests:

- 1- Screening test like EIISA test which is sensitive & specific.

The result can be positive, Indeterminate & Negative.

False positive result may occur in cases of Influenza vaccination, chronic liver disease and the presence of auto antibodies in the serum.

- 2- Confirmatory test like Western blot which is very specific for HIV antibodies. It's a gold standard for the diagnosis of HIV infection.

