Basic General Information

Editor: This general article has been in a very easy language for us to understand clearly as also to explain to our patients so they understand.

HIV stands for Human Immuno-deficiency Virus and this HIV causes a disease complex known as AIDS (Acquired Immuno Deficiency Syndrome). Thus, HIV is the virus and AIDS is the disease caused. They are not synonyms. To understand them better, let us dissect them out

HIV: Self explanatory – a Virus that affects Humans causing Deficiency of Immune system. HIV is highly infectious.
AIDS: Acquired: because it is not an inborn condition, but acquired during or after birth. Immune – Deficiency: deficiency in the body's natural defense mechanism or the immune system Syndrome: a group of symptoms affecting multiple systems, all of which are due to the body's diminished ability to fight diseases.

It is important to remember that everyone who has contracted HIV infection will develop full blown AIDS over a period of time (max 10 yrs) depending upon their general health and natural defence mechanism of the body.

What does HIV look like?
Just as all viruses, the HIV is also very small and can only be seen through an electron microscope. It is so small that about 10,000 viruses can be placed in circle, having a diameter of one mm. (pic right side ➔)

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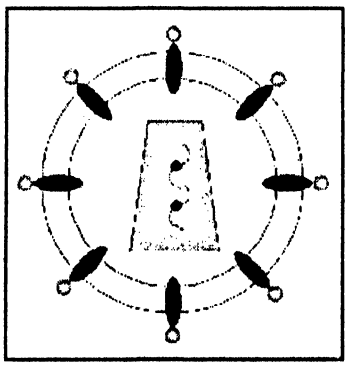
How does HIV affect the body?
HIV destroys our lymphocytes - 25% of the total white blood cells, essential for destroying disease-causing organisms. These lymphocytes normally multiply in response to any infection. There are two types of lymphocytes: B cells & T cells. B cells secrete large amounts of antibodies when they come in contact with bacteria or viruses. T cells on the other hand destroy the specific disease causing organisms. They are also called "killer cells" because of their killer action.
How does HIV spread?
HIV infection spreads through 3 main routes:
Direct - sexual intercourse or deep kissing. Oral or anal sex also leads to transmission of virus from one partner to the other. More than 75% people are estimated to get it through sexual transmission.
Indirect – body fluids of the infected person like blood, vomit, excreta etc and infected syringes. HIV is present in all body fluids of an infected person. It is however more in number in blood, semen and vaginal fluids.
Vertical – mother to child transmission during pregnancy or delivery.

The probability of getting the infection, with one encounter, is not the same by all routes.
What then decides the fate of transmission?
Four main conditions must be fulfilled if HIV is to be transmitted through any one of the three routes mentioned above. These include:



1. HIV must be present in the body fluids, especially the semen, vaginal fluids, blood or blood products.
2. HIV must live during the period it is out of the body. It can live for a long time in blood, stored at

cold temperatures for transfusion but lives for a short time in all other situations as the body fluids dry very easily. HIV cannot survive in dried body fluids.

3. There must be convenient portal for entry. The normal skin forms a very effective barrier and HIV will find it difficult to enter through intact skin. The virus can easily enter the body from wherever there is damage to the skin or the skin is more delicate (such as vagina or anus).
4. The number of viruses in the body fluids must be adequate to infect others after it is transferred to contact with body fluids. If the number of viruses that enter another person is less, then the infection may not occur.

SEXUAL TRANSMISSION:

The most common (75%) route of the spread of HIV infection is through unprotected sex (without condom) between two people, one of whom already has HIV infection. Unprotected vaginal sex, is a more common source of infection in India as compared to unprotected anal sex. HIV is present in the sperms as well as the seminal fluids. Even one episode of unprotected sex with an infected partner can transmit HIV. Multiple such episodes increase the risk of infection.

Women are at greater risk of developing HIV infection through unprotected sex. This means that the risk of transmission of HIV from man to woman is higher than that from woman to man, for the following reasons:

- The semen from the infected male sexual partner remains in the woman's vagina for a longer time. Longer contact between infected semen and delicate wall of the vagina increases the risk of HIV infection.
- The surface area of the vagina is very large compared to the urethra in men. Larger surface area provides greater opportunity for the virus to enter the body.
- A large number of women who have sexually transmitted infections of their reproductive tract, may not themselves have any symptoms at all. In the absence of any symptoms, they will not know they have the infections and will therefore not take appropriate treatment. These STDs allow greater opportunity for the HIV to enter the body and cause infection.

FACTORS THAT AFFECT TRANSMISSION OF HIV INFECTION

1. Sexually transmitted diseases increase the risk of HIV infection because they allow easy entry for the HIV.
2. Anal Sex. Irrespective of whether it is hetero or homo sexual, it increases their risk of HIV. This is because the delicate skin inside the anus gets damaged more easily during sexual act.
3. Sex during menstruation with a woman having HIV infection increases the risk of transmitting HIV to the male partner.
4. Oral Sex has low risk of transmission of HIV. The risk is higher in case there are wounds, cuts or injuries in the mouth.
5. Blood transfusion has a small risk of transmitting HIV. Although the government has made testing the blood for HIV before transmission compulsory, the test may be negative during window period (up to 3 – 6 months).
6. Intravenous drug injections have a very high risk of transmission of HIV especially among drug abusers who share needles to inject addictive drugs. Intravenous injections with sterilized needles and syringes have no risk of transmitting HIV.
7. Injections in the muscles or below the skin have very low risk of transmitting HIV. Pricking the skin for tattooing, piercing ears, nose etc. have low risk of transmitting HIV infection if sterilized needles are used.
8. Pregnant women can transmit the HIV infection to their unborn child either during pregnancy or during childbirth.
9. Breast-feeding has low risk of transmitting HIV infection to the baby. The risks of bottle-feeding are higher than the risks of HIV infection due to breast-feeding. This is why it is recommended that

women with HIV infection continue to breast feed their baby.

WAYS IN WHICH HIV DOES not TRANSMIT:

1. Hugging, Kissing, Shaking hands, Kissing on the cheeks, hands etc.
2. Coughing or sneezing
3. Insect or mosquito bites
4. Sharing clothes or towels
5. Using the same equipments such as telephones.
6. Eating from the same utensils
7. Swimming pools
8. Sharing the same toilets
9. Being with infected people in crowds or public places
10. Nursing People with HIV infection
11. Washing clothes, bed sheets etc. used by people with HIV infection.

WHAT ARE THE SYMPTOMS OF HIV/AIDS?

NO SYMPTOMS: A person infected with HIV may not have any symptoms for about three to ten years, depending on the natural defence mechanism of the body. He/she can still spread the infection to others. This is the reason why practice of safe sex is recommended when one is involved with multiple partners. This means using condoms correctly for every sexual act.

To understand why HIV infection does not cause immediate symptoms, it is important to understand what happens in the body, soon after the entry of HIV. As mentioned earlier, HIV infects a large number of T (killer) lymphocytes soon after it enters the body. It multiplies rapidly in the T4 (CD4) cells. During the early or acute stage of the infection, the blood will contain a large number of viral particles. These particles rapidly spread through various organs and infect them. They particularly infect the organs of the lymphatic system. People with HIV infection do not develop persistent severe symptoms for up to 10 years after the virus enters the body. Children born with HIV infection may however develop the symptoms within two years. The symptoms appear because of the gradually diminishing defence mechanism of the body. This is the stage when AIDS develops.

Most symptoms or AIDS are due to opportunistic infections that occur, taking advantage of the body's poor defence mechanism. The symptoms of AIDS are divided into major and minor symptoms. As per the definition of AIDS given by WHO, a person is said to have full blown AIDS if he/she has at least two major signs and at least one minor sign and there is no other cause of poor immune mechanism. The term "AIDS related illness" is used when a person has some signs and symptoms, has antibodies to HIV in the blood but does not have two major and one minor sign.

SIGNS AND SYMPTOMS OF AIDS

MINOR SIGNS:

a. Cough for more than one month, not responding to routine treatment
b. Enlargement of the lymph nodes in the various parts of the body.
c. One of the common symptoms of AIDS is an infection of the mouth called candidiasis (due to candida albicans). Candidiasis results in thick, white, fur like coating on the tongue and rarely on the roof of the mouth. It can cause dryness of the mouth, difficulty in swallowing and altered sense of taste. This infection is not common among people with normal defence mechanism because their body is able to fight the infection successfully. Candidiasis may also be present in the elderly with poor defence mechanism, sick children and babies who are bottle fed. It can also affect the vagina in women. Candidiasis in people with AIDS can also spread to the lungs and digestive tract.
d. Dermatitis: itchy skin lesions all over the body.
e. Infection due to Herpes viruses: Herpes simplex and Herpes zoster are the two common infections in AIDS. Though Herpes can affect anyone, it is severe in people with AIDS. The painful sores usu-

ally occur inside or around the mouth, genital area or area around the anus. Chronic herpes simplex, another viral infection that affects the nervous system. It results in small irritating or painful fluid filled blisters on the skin and inner lining of body cavities that open outside, such as mouth, respiratory tract, urinary tract, etc. More than one attack of Herpes of any part of the body should make one suspect HIV/AIDS or some other condition destroying the immune system.

MAJOR SIGNS:

a. Unexplained loss of weight, greater than 10% of the total body weight during one month.
b. Chronic fever that lasts for more than one month.
c. Chronic diarrhoea that lasts for more than one month. Diarrhoea is very common in people with AIDS. It is normally clear and watery and may be associated with cramp like pain in the abdomen and vomiting. Chronic diarrhoea with excessive loss of weight is an important feature of AIDS and in most cases the first point of suspicion. There may also be continuous fever and increased sweating at nights.

WHAT ARE THE OPPORTUNISTIC INFECTIONS IN AIDS?

Due to poor defence mechanism of the body, several organisms that otherwise would not have been able to, infect people with AIDS. Detailed below are some of the common opportunistic infections seen in people with AIDS.

a. **Tuberculosis**: Tb is already one of the major health problems in India, people with HIV infection are at higher risk of getting it. With upsurge of HIV, the looming spectre of Tuberculosis has become horrifying. Many Indians have latent tuberculosis, meaning they have neither signs/symptoms nor are they able to spread the disease to others. They can however become sick and get infected with active tuberculosis at the later stage. With defence mechanism at a low, these get active infection very fast and to add to misery, do not respond to treatment. Resistant tuberculosis is one of the important causes of the early death in people with HIV infection. Tuberculosis often occurs in the early stages of HIV infection. Very often, resistant Tuberculosis is the first indication that a person has HIV infection. Although tuberculosis largely affects the lungs, it can also affect other organs of the body. People with AIDS are more likely to get infection in other organs of the body. Common symptoms of tuberculosis include cough, fever, increased sweating at nights, loss of weight and excessive fatigue.
b. **Fungal infection of the lungs**: Pneumocystis carinii pneumonia is the fungal infection of the lungs that results in symptom similar to pneumonia due to bacterial infection. It results in persistent dry cough and death can occur when it spreads to other organs of the body.
c. **AIDS dementia complex**: This is not a true opportunistic infection. It is one of few conditions caused directly by the HIV virus. HIV can cross the blood brain barrier present all around the brain. It can damage not only the brain but also the spinal cord– the extension of the brain that emerges from the base of the neck and passes through the backbone – and the nerves. Common symptoms of AIDS dementia complex include confusion, depression and a strange unusual behaviour. There may be general loss of interest in the surroundings, indifference, etc. In later stages, it causes loss of memory, uncoordinated movements, or paralysis.
d. **Kaposi's sarcoma**: This is a most common cancer seen in people with AIDS. Some studies have indicated that this is due to infection by one of the herpes group of viruses. Although exact cause is not known, its presence is a definite indication of AIDS. Common symptoms of include red or purple raised areas on the skin. They may also be present in internal organs of the body such as mouth, lymph nodes, digestive tract and lungs. Recent advances in management of Kaposi's sarcoma have increased the chances of complete recovery.

e. **Cryptococcal meningitis:** This infection is caused by yeast like fungus called cryptococcal neoformins. It is found in the soil in most parts of the world, especially the soil that is contaminated with bird droppings. In the early stages of the infection, the fungus affects the brain and the lungs. In later stages, it can affect any part of the body. Cryptococcal meningitis is more common among people with CD4 count less than fifty. Common symptoms of cryptococcal meningitis include fever, mild headache followed by nausea, vomiting, severe headache and blurring of vision.

Kaposi's sarcoma and Cryptococcal Meningitis are the two diseases that are a definite indication of AIDS.

HIV: DIAGNOSIS? LABORATORY INVESTIGATIONS:
ELISA TESTS – to detect antibodies. The most common test to detect HIV antibodies is the ELISA test, which is abbreviation of ENZYME LINKED IMMUNO SORBENT ASSAY. ELISA is a preferred initial test for HIV testing mainly because it is simple and sensitive. It is therefore suitable for testing large number of blood samples. It is important to remember that there are several ELISA kits available commercially and not all of them confirm to recommended guidelines. It is therefore recommended that the ELISA test is performed in laboratories approved or supported by the National AIDS Control Organisation.
The Government of India has recommended that only if two consecutive and separate ELISA test have indicated the presence of antibodies, further tests to confirm HIV infection are recommended. These tests are expensive and therefore many medical practitioners recommend three consecutive ELISA tests to be done instead of doing a confirmatory test.
If each of the tests indicates the presence of HIV antibodies, the tested person is said to have HIV infection. As mentioned earlier, a person infected with HIV develops antibodies only after about 3 to 6 weeks. The period between contracting the actual infection and the time when antibodies appear in the blood is called the **window period**. ELISA test will be negative if the blood is tested in the **window period.**
THE STRIP TEST: The validity of it is useful only for mass screening, but the second should be followed by Elisa. There are very few available which use whole blood. Most strips use serum, so one has to be careful while buying strips. If the serum is being separated than might as well do Elisa.

WESTERN BLOT: Most common test used to confirm HIV infection is the Western Blot test. This test also detects antibodies to HIV. A western blot test is said to be positive if the test shows reactivity to at least two components of the virus. A negative test is one, which does not indicate antibodies to any of the components of the virus. In case there is reactivity to one or more antigens only, or if there is weak reaction, the test results is said to be doubtful. It is important to remember that about 15% people who are not infected with HIV can also have doubtful test result. This is why Western Blot test is recommended only after two consecutive ELISA tests have been positive.
VIRAL LOAD - to identify the virus and estimate its number in the body. The most common test to detect HIV itself is called polymerase chain reaction or PCR test. These tests indicate the presence of the virus in newborn babies or adults within a week of their getting HIV infection. The PCR test can also estimate the number of viruses in the blood and therefore are used to assess the progress of the disease.
CD4 (T4) COUNT – to estimate the number of T cells in the blood. Estimating the number of T cells in the blood or the total CD-4 count in the blood is used for identifying the stage of HIV infection, plan the most suited treatment option and establish the diagnosis of AIDS. It can also be used to decide whether specific preventive measures are desirable for opportunistic infections or not. This is because a decline in CD4 cells indicates increased risk of getting infections. A CD4

count of less than 200 is diagnostic of full blown AIDS. It is also used as marker for response to treatment given.

When is a blood test for HIV recommended?

The HIV test results can have major impact on the psychological status of the person tested, family, relationships with other members, employment opportunities, etc. This is why HIV testing should not be done without informed consent. This means that the person being tested should understand the consequences of the test results. It is also important to keep the test results confidential.

HIV testing without consent is done for all blood samples collected for transfusion and during sentinel surveillance. The test results are however confidential and anonymous. Testing the blood for HIV without informed consent is ethically wrong and is strongly discouraged by the Govt of India and all agencies involved in prevention and control of HIV/AIDS in India.

HIV tests: Interpretation

Negative test result:

- The person tested does not have HIV infection, or
- The person tested has HIV infection but is in Window Period.

Positive test result in a person above 15 months of age:

- The person tested has antibodies against HIV in his/her blood.
- Presence of antibodies indicates that the person has HIV infection. He/she can therefore spread the virus to others.

Positive test result in a person under 15 months of age:

- The child has received antibodies to HIV from his/her mother.
- The HIV antibodies acquired by a child from the mother normally disappear by 15 months.
- HIV test needs to be repeated after the child is 15 months old in order to find out if the child has got HIV infection or not.

SUMMARY OF TESTS FOR DIAGNOSIS FOR HIV INFECTION

Test	Primary Illness	Early Disease	Inter Disease	Late Disease	Advantages	Disadvantages
ELISA	+/-	+ve	+ve	+ve	Inexpensive, suited for large no. of samples	False positive or negative occurs in 1%
WB	+/-	+	+ve	+ve	Diagnostic if positive	False negative common in early infections, expensive
P24	++	+/-	+/-	+ve	Becomes +ve earlier than ELISA, used for diagnosis of intial infections.	False negative common in intermediate & early stage
Qualitative PCR	+	+	+	+	Diagnostic most sensitive for diagnosis of intial infections.	Gives no information about severity of viremia
Viral Load	+++	+	++	+++	Quantitative, used for prognosis or for monitoring therapy.	Very expensive
Viral Culture	+	+/-	+/-	+	Positive early, Used for prognosis	Very expensive, not easily available. False negative common.
Spot tests (eg Latex aggl.)	-	+	+	+	Inexpensive, suited for small no. of samples, Rapid test	High (1-5%) false positive and false negative rates.

DISINFECTION

Just as it is extremely difficult to destroy HIV virus in the body, it is extremely easy to do so outside the body. HIV virus can easily be killed by heat and by drying. Once the body secretions dry out or it is left in the sunlight for a few minutes, it gets easily destroyed.

For domiciliary disinfection of suspect discharges, just add 2 tsf of ordinary bleaching powder to half a bucket of water and use it to disnfect.

GUIDELINES for UNIVERSAL PRECAUTIONS

As it is difficult to say who has HIV infection, just by looking at them, it is necessary to deploy Universal precautions at all times. Guidelines given below are same for doctors, para medical workers and people looking after suspected or confirmed HIV/ AIDS patients

a. Wear gloves if there is a risk of contact with blood and body fluids either while examining a person or doing any procedures.
b. Wear eyeglasses or goggles, mask and gown if there is a risk of body fluids or blood splashing on you.
c. Always wash hands before and after physical contact with a patient.
d. Always wash hands after removing gloves.
e. For washing hands, use running water for at least half a minute.
f. Liquid soap is preferable to solid soap for washing hands.
g. Use 0.5-1% sodium hypochlorite solution (2 tsf of domestic bleaching powder in half a bucket of water) to disinfect surfaces that have come in contact with body fluids or blood.
h. Use water proof dressings to cover cuts and abrasions during physical contact with patient.
i. Do not pass sharp instruments hand to hand. Place them in a flat surface so that the other person can pick it up.
j. Do not use hand needles
k. Do not guide needle into the body of the patient with the fingers.
l. Do not resheath used needles.

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HIV Counselling: Its Nature & Purpose

In counselling, two people, not related to each other, meet to resolve a crisis, solve a problem, or make decisions involving highly personal and intimate matters. Promoting the well-being and problem solving skills requires continuous gradation between detachment and closeness, within which the counsellor must find the correct balance; of the client.

HIV /AIDS counselling has two general objectives: (I) To provide psychological support to those already affected; and (2) to prevent HIV infection by changing lifestyles and life style behaviour.

The Counseling process can:

1. Ensure passing on of correct information
2. Provide support at times of crisis
3. Encourage change when change is needed for the prevention or control of infection.
4. Help clients focus and identify for themselves their immediate and long term needs.
5. Propose realistic action suitably adapted to the different clients and circumstances.
6. Assist clients to accept and act on information on health and well-being; and
7. Help clients to be well-informed and appreciate the technical, social, ethical and legal implication of HIV testing.
8. Give psychological support.

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