

## AN EXAMINATION ON HIV AIDS: A SUBSTANTIAL THREAT TO MANKIND

Dr. Ruchi Choudhary\*; Dr. Vishvanayak\*\*

\*Associate Professor,  
Department of Pharmacology, Teerthanker Mahaveer University,  
Moradabad, Uttar Pradesh, INDIA  
Email id: ruchi.upmanyu@gmail.com

\*\*Professor,  
Department of General Medicine, Teerthanker Mahaveer University,  
Moradabad, Uttar Pradesh, INDIA  
Email id: vishvanayak@gmail.com

DOI: **10.5958/2249-7137.2021.02500.3**

---

### ABSTRACT

*HIV/AIDS has long been one of the world's most widespread illnesses. HIV infection and AIDS are caused by the human immunodeficiency virus (HIV), which is a lent virus. AIDS is a human disease in which the immune system gradually fails, allowing life-threatening infections and malignancies to flourish. HIV infection is spread via the transmission of blood, sperm, vaginal fluid, and breast milk. HIV is found in various body fluids as free virus particles as well as virus inside infected immune cells. HIV infects important immune cells such as helper CD4 T cells and macrophages. Through a variety of processes, including pyro ptosis of contaminated T cells, HIV infection causes low numbers of T cells. The manifestations of AIDS are mainly caused by diseases that do not occur in people who have a sound immune system. The majority of these infection caused by bacteria, viruses, fungi, and parasites that are usually regulated by immune system components that HIV destroys. When a couple with one infected partner uses condoms on a regular basis, the risk of HIV infection is less than 1% per year. Female condoms may offer an equal degree of protection, according to some research.*

**KEYWORDS:** AIDS, HIV, HIV Infection, Highly Active Antiretroviral Therapy (HAART), Antiretroviral Therapy (ART).

---

### 1. INTRODUCTION

AIDS (acquired immunodeficiency syndrome) is a disease acquired immune deficiency syndrome virus (HIV). Infection with HIV is a contemporary danger that may easily be described as a curse on humanity. Following an upsurge in the frequency of extremely uncommon opportunistic infections and malignancies among apparently healthy gay men, the research community first observed and acknowledged the existence of AIDS as a disease. Soon after the first formal identification of HIV patients in the United States, HIV-1 was recognized as the pathogenic organism. HIV-2 was originally discovered in Africa in 1985, and it differs significantly from HIV-1. It looks a lot like a simian virus that infects captive macaques. Simian

---

viruses, which normally infect African monkeys, are thought to have transmitted HIV 1 and HIV-2 to humans through numerous cross-species transmissions. Despite improvements in antiretroviral therapy, the worldwide incidence of HIV has increased since its discovery and has already spread throughout the globe (ART). Because of food poverty and malnutrition, the mortality and morbidity rates associated with HIV infections keep rising in developing nations. Other factors contributing to the widespread spread of HIV in the general population include long-term concurrent sexual partnerships and high pathogenicity during the early stages of HIV infections. [1], [2]

1.1 The Disease:

The immune system, particularly CD4 T-lymphocytes, is the primary target of the assault (CD4 cells). Once infected, the virus gradually and quietly overpowers the host's defensive systems, causing opportunistic infections and malignancies that would otherwise be uncommon. CD4 cells that have been activated and differentiated play a critical role in the activation of both the cell-mediated and humoral immune systems. CD4 cells in the peripheral blood are depleted as a consequence of HIV infection. The depletion persists in untreated patients for many years until the patient finally succumbing to AIDS.

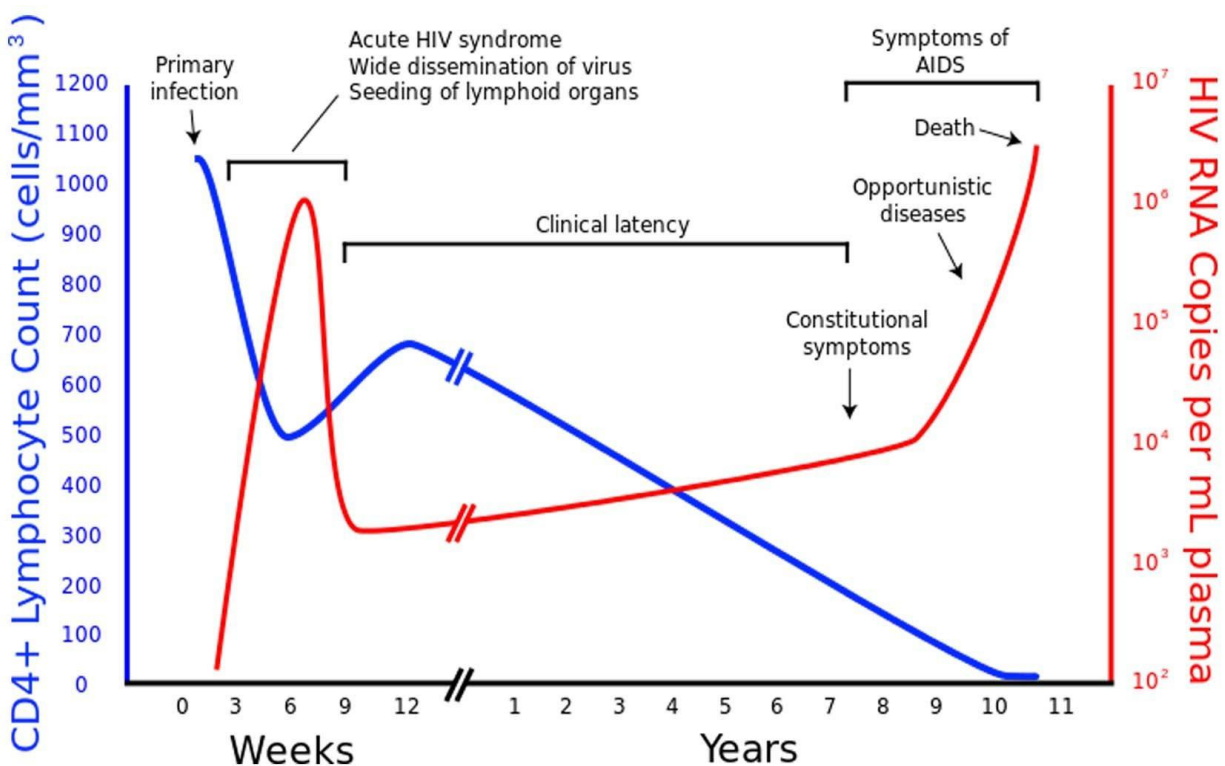


Figure 1: HIV time course.

The following Figure 1 represents the timeline of HIV infection from the initial infection to the expression of AIDS defining symptoms. (Figure 1)It is the last stage of HIV infection, and it may appear at between two and fifteen years after infection.[3], [4]

1.2 HIV subgroups:

## *1.2.1 HIV-1:*

The wide genetic diversity of HIV-1 is well-known. HIV-1 is divided into four distinct lineages: M, N, O, and P. Group M is the most frequently reported HIV virus worldwide. Group N is less common and has only been recorded from Cameroon. Group O is responsible for 1% of all HIV-1 infections and is mostly prevalent in Cameroon and Gabon. Group P is the rarest of all, having been discovered in a pregnant Cameroonian lady in France. It accounts for just 0.06 percent of all HIV infections.

## *1.2.2 HIV-2:*

HIV-2 is most frequently recorded in West Africa, with the greatest rates in Guinea-Bissau and Senegal. There are eight distinct kinds of HIV-2, referred to as HIV-A through HIV-H. Group A has been detected all across Sub-Saharan Africa. In the Ivory Coast, Group B is more frequently recorded. C to H transmissions are classified as "dead-end" transmissions because they generate no following infections due to the irregular nature of the illness and frequency. [5], [6]

## *1.3 Current HIV infection status and death rate:*

### *1.3.1 Western, Central, and North American regions:*

In this area, about 2.4 million people are HIV-positive. In 2014, an estimate 85,000 new HIV transmissions were recorded, with the United States accounting for more than half of all infections. During the same time period, about 26,000 AIDS-related fatalities were recorded.

### *1.3.2 Asia and the Pacific:*

In Asia and the Pacific, about five million people had already been infected, with up to 340,000 new HIV diagnoses occurring that year. With approximately 240,000 fatalities, China, Indonesia, and India account for about 78 percent of the overall new global burden of disease in Asia and the Pacific. Patients taking antiretroviral therapy (ART) account for around 36% of HIV patients, with 3.2 million HIV patients without access to ART.

### *1.3.3 Pakistan:*

The first incidence of HIV infection in Pakistan was recorded in 1987. The prevalence of HIV has been rising since it was first recorded, according to the Pakistan National AIDS Control Program's yearly report. According to UNAIDS, the joint United Nations program on HIV/AIDS, there are about 94,000 people living with HIV infection. Adults have a prevalence rate of between 0.1 percent and 0.2 percent. Roughly 26,000 women, ages 15 and up, and about 2,100 children, ages 14 and up, are presently living with HIV. In the year 2014, there were 2,800 AIDS-related fatalities in this area [7]–[9].

## **2. DISCUSSION**

### *2.1 Treatments options for HIV:*

HIV infection has a complicated etiology that differs greatly across individuals. As a result, it's easy to classify it as a highly host-specific infection. Various combinations of available medicines may be used to effectively control HIV infection. Antiretroviral therapy is the name given to this kind of treatment (ART). HAART (highly active antiretroviral treatment) is a combination of at least three medications used in standard antiretroviral therapy. Effective

antiretroviral therapy (ART) may help limit HIV multiplication and raise CD4 cell counts in infected individuals, extending the asymptomatic period of infection, delaying disease development, and lowering the risk of dissemination [10].

### *2.2 Invasion of human cells:*

HIV is the only virus capable of replicating itself inside human cells. This process starts when the virus infects a cell that has the cd4 protein on its surface. The HIV virus binds to the cd4 receptor, allowing it to merge with it. HIV primarily affects immunological cells, such as T-helper cells, which make up the body's immune system. As HIV infects more cells, the immune system weakens.

### *2.3 Reverse transcription:*

Reverse transcription is aided by the enzyme reverse transcriptase. Reverse transcriptase is responsible for converting viral RNA into DNA. After that, DNA is carried to the nucleus of the cell, where it is inserted by the enzyme integrase.

### *2.4 Transcription and translation are two of the most important aspects of any project:*

The transcribing process is now underway. The HIV virus transforms itself into messenger RNA.

### *2.5 Constructing, budding, and maturing:*

Copies of HIV combine with freshly synthesized HIV protein and enzymes to create new viral particles that bud out from the original CD4 cell. Protease is an enzyme that breaks down large chains of HIV protein into smaller chunks. The newly discovered virus has the capacity to infect and target additional CD4 cells [11]. While there is a growing corpus of research on HIV and how it affects individuals with disabilities, there are still many gaps in our understanding. According to studies, the level of HIV awareness among individuals with disabilities is usually poor. We do, however, need to learn more about how this information is used in practice. Although several studies have looked at the incidence of unsafe sex and other risk factors, there are major gaps in understanding the various HIV risk factors across different handicap groups. We need to learn more about HIV risk in people with all kinds of disabilities, as well as the problems and obstacles that come with them.

The bulk of current research has focused on individuals who have mental health issues, learning/intellectual disabilities, or who are deaf or hard of hearing. The wide spectrum of HIV risk among individuals with physical disabilities, such as those who are blind or have visual problems, albinism, or who are physically handicapped, is much less well understood. More data is required not just on the incidence of unsafe sex, but also on how disability interacts with the many variables that promote sexual risk, such as poverty, drug addiction, and gender inequality. We also need to learn more about how disability, gender, stigma, social isolation, and risk behaviors interact. While there is research on similar topics including susceptibility to violence and sexual abuse (e.g., Groce, 2005b; Grossman & Lundy, 2008; Sullivan & Knutson, 2000), these studies do not explicitly connect these problems to HIV risk. Furthermore, there are vast areas of the globe, such as South America, Asia, and Europe, where there is little or no data on these problems.

On the prevalence and habits, good statistical data is required. Antenatal clinic monitoring or population-based surveys are often used in national HIV and AIDS prevalence research (usually

household surveys). However, the same barriers that prevent persons with disabilities from receiving HIV and AIDS care also prevent them from being included in prevalence studies. According to studies, females with impairments encounter many physical and psychological obstacles to obtaining fertility and prenatal care.

### 3. CONCLUSION

Historically, HIV prevention efforts have mainly focused on creating risk reduction strategies for those who are at high risk of contracting the virus. Only 18 (32.7 percent) of 55 state and municipal submissions to the CDC for funding for HIV prevention programs identified HIV-infected people as a target group for HIV prevention initiatives, according to a 1999 study. Despite the fact that millions of individuals in the United States are at "behavioral risk" for HIV infection, the virus can only be transmitted between infected persons. As the number of people living with HIV continues to rise as a result of antiretroviral therapy (ART), so does the need for lifetime preventive measures tailored to them.

The nature and course of HIV/AIDS have changed significantly as a result of recent breakthroughs in HIV therapy. If infected individuals get appropriate ART, it may be safely classified as a "chronic" illness. Unfortunately, current HIV burden data reveal a different story: one of a constant incidence of HIV-related fatalities. When antiretroviral therapy (ART) is administered correctly, more individuals died due to complications and the progression of HIV to AIDS than should be the case. The most significant challenge a physician confronts with ART is the occurrence of negative side effects, which cause patients to stop taking the medication. Poverty, a lack of knowledge, and the social stigma associated with the illness all add to the complexity of an already difficult situation. Appropriate adjustments in treatment regimens and medicines may assist patients in overcoming the disease's negative symptoms and possible consequences. Additionally, adequate counseling for medication adherence and mental health support should be provided to patients and their close family members.

### REFERENCES:

1. Nasrullah M. et al. Comparison of alternative interpretive criteria for the HIV-1 Western blot and results of the Multispot HIV-1/HIV-2 Rapid Test for classifying HIV-1 and HIV-2 infections. *J. Clin. Virol.*, 2011 Dec;52 Suppl 1:S23-7. doi: 10.1016/j.jcv.2011.09.020.
2. Palmer S, Josefsson L, Coffin JM. HIV reservoirs and the possibility of a cure for HIV infection. 2011;270(6):550–560. doi: 10.1111/j.1365-2796.2011.02457.x.
3. Sevilya Z. et al. Killing of latently HIV-infected CD4 T cells by autologous CD8 T cells is modulated by Nef. *Front. Immunol.*, 2018, doi: 10.3389/fimmu.2018.02068.
4. Douek DC. et al. HIV preferentially infects HIV-specific CD4+ T cells. *Nature*, 2002 May 2;417(6884):95-8. doi: 10.1038/417095a.
5. Vijayan KV, Karthigeyan KP, Tripathi SP, Hanna LE. Pathophysiology of CD4+ T-Cell depletion in HIV-1 and HIV-2 infections. *Frontiers in Immunology*. 2017;8:580. doi: 10.3389/fimmu.2017.00580.
6. Wejse C. et al. Impact of HIV-1, HIV-2, and HIV-1+2 dual infection on the outcome of tuberculosis. *Int. J. Infect. Dis.*, 2015 Mar;32:128-34. doi: 10.1016/j.ijid.2014.12.015.

7. Girum T, Wasie A, Worku A. Trend of HIV/AIDS for the last 26 years and predicting achievement of the 90-90-90 HIV prevention targets by 2020 in Ethiopia: A time series analysis. *BMC Infect. Dis.*, 2018;18: 320. doi: 10.1186/s12879-018-3214-6.
8. Kharsany ABM, Karim QA. HIV Infection and AIDS in Sub-Saharan Africa: Current Status, Challenges and Opportunities. *Open AIDS J.*, 2016, doi: 10.2174/1874613601610010034.
9. K. Hess et al., “Diagnoses of HIV Infection in the United States and Dependent Areas. *HIV Surveill. Rep.*, 2016 Apr 8;10:34-48.
10. Benu RRYP, Rao SHB, Simanchal P, Prasanna K. Predictors of Mortality among HIV Patients on HAART in an ART Centre – A Retrospective Study. *Int. J. Med. Public Heal.*, 2016, doi: 10.5530/ijmedph.2016.4.6.
11. Woodham AW. et al. Human Immunodeficiency Virus Immune Cell Receptors, Coreceptors, and Cofactors: Implications for Prevention and Treatment. *AIDS Patient Care STDS*, 2016 Jul;30(7):291-306. doi: 10.1089/apc.2016.0100.