

The Transmission, Prevention and Impact of Human Immuno-Deficiency Virus (HIV) Inhibition

Michael Oppenheimer*

Department of Microbiology, University of UCSI, Federal Territory of Kuala Lumpur, Malaysia

DESCRIPTION

Human Immunodeficiency Virus (HIV) remains a global health challenge, affecting millions of people worldwide. Despite significant advancements in treatment and prevention, HIV continues to pose serious risks to public health. This study, explores into the intricacies of HIV, exploring its origins, transmission, impact, treatment and the ongoing efforts to combat this virus.

Origins and structure

HIV belongs to the retrovirus family, characterized by its ability to convert its Ribo Nucleic Acid (RNA) genome into Deoxy Ribo Nucleic Acid (DNA) upon infecting host cells. There are two main types of HIV: HIV-1 and HIV-2. HIV-1 is the most prevalent and virulent strain globally, responsible for the majority of HIV infections. HIV-2 is less common and primarily found in West Africa.

The structure of HIV consists of an outer envelope derived from the host cell membrane, surrounding a protein capsid enclosing the viral RNA genome and enzymes necessary for replication. The virus primarily targets Clusters of Differentiation 4+ (CD4+) T cells, a crucial component of the immune system, leading to their destruction and impairment of immune function.

Transmission

HIV transmission occurs through contact with certain bodily fluids, including blood, semen, vaginal fluids and breast milk. The most common modes of transmission include:

Unprotected sexual contact: Sexual intercourse, especially unprotected anal or vaginal sex, poses a significant risk of HIV transmission, particularly if one partner is infected and not receiving treatment [1].

Sharing needles: Injection drug use involving the sharing of needles and syringes can facilitate HIV transmission.

Vertical transmission: HIV can be passed from an infected mother to her child during pregnancy, childbirth or breastfeeding.

Blood transfusion: While rare in regions with stringent screening measures, HIV transmission through blood transfusions or organ transplants from infected donors remains a concern in some parts of the world.

Impact

HIV infection progresses through various stages, ultimately leading to Acquired Immunodeficiency Syndrome (AIDS) if left untreated. The impact of HIV/AIDS extends beyond physical health, encompassing social, economic, and psychological dimensions. Key impacts include:

Immune suppression: HIV targets and depletes CD4+ T cells, weakening the immune system and rendering individuals more susceptible to opportunistic infections and malignancies.

Stigma and discrimination: HIV/AIDS is often accompanied by stigma and discrimination, leading to social isolation, rejection and even violence against affected individuals and communities [2].

Economic burden: HIV/AIDS places a significant economic burden on individuals, families and healthcare systems due to the costs associated with treatment, care and loss of productivity.

Psychological effects: Living with HIV/AIDS can cause psychological distress, including depression, anxiety and trauma, which may further impact overall well-being and quality of life.

Treatment and prevention

Advances in HIV treatment have revolutionized the management of the virus, transforming it from a life-threatening illness to a manageable chronic condition. Antiretroviral Therapy (ART) is the cornerstone of HIV treatment, consisting of combinations of medications that suppress viral replication, restore immune function and prevent disease progression.

Correspondence to: Michael Oppenheimer, Department of Microbiology, University of UCSI, Federal Territory of Kuala Lumpur, Malaysia, Email: oppenheimer_m@medu.com

Received: 23-Feb-2024, Manuscript No. VMID-24-30455; **Editor assigned:** 27-Feb-2024, PreQC No.VMID-24-30455 (PQ); **Reviewed:** 12-Mar-2024, QC No.VMID-24-30455; **Revised:**19-Mar-2024, Manuscript No. VMID-24-30455 (R); **Published:** 26-Mar-2024, DOI: 10.35248/2161-0517.24.13.284

Citation: Oppenheimer M (2024) The Transmission, Prevention and Impact of Human Immuno-Deficiency Virus (HIV) Inhibition. Virol Myco. 13:284.

Copyright: © 2024 Oppenheimer M. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Additionally, Pre Exposure Prophylaxis (PrEP) and Post Exposure Prophylaxis (PEP) are preventive measures that significantly reduce the risk of HIV transmission in high-risk individuals [3].

Challenges and ongoing efforts

Despite progress in HIV prevention and treatment, significant challenges remain in the global fight against the virus. These challenges include:

Access to treatment: Many individuals living with HIV lack access to adequate healthcare services, including HIV testing, treatment and care, particularly in resource-limited settings [4].

Stigma and discrimination: Persistent stigma and discrimination hinder efforts to address HIV/AIDS effectively, discouraging individuals from seeking testing, treatment and support services.

Vulnerability and risk factors: Socioeconomic factors, such as poverty, lack of education, gender inequality and marginalization, contribute to increased vulnerability to HIV infection and hinder prevention efforts.

Emerging challenges: New challenges, such as the emergence of drug-resistant HIV strains, co-infections with other pathogens (e.g., tuberculosis, hepatitis) and the impact of Corona Virus-2019 (COVID-19) on HIV services, require ongoing study and intervention strategies.

CONCLUSION

HIV remains a complex and multifaceted global health issue, requiring a comprehensive and coordinated response from governments, healthcare providers, civil society and affected communities. Continued investment in research, prevention, treatment and support services is essential to achieve the goal of ending the HIV/AIDS epidemic and ensuring the health and well-being of all individuals affected by the virus.

REFERENCES

1. Swendeman D, Rotheram-Borus MJ, Arnold EM, Fernández MI, Comulada WS, Lee SJ, et al. Optimal strategies to improve uptake of and adherence to HIV prevention among young people at risk for HIV acquisition in the USA (ATN 149): a randomised, controlled, factorial trial. *Lancet Digit Health*. 2024;6(3):187-200.
2. Li WY, Yin S, Huang SW, Yang MH, Chen PM, Wu SR, et al. The trajectory patterns of single HIV-1 virus-like particle in live CD4 cells: a real time three-dimensional multi-resolution microscopy study using encapsulated nonblinking giant quantum dot. *J Microbiol, Immunol Infect*. 2023;56(2):257-266.
3. Real LM, Sáez ME, Corma-Gómez A, Gonzalez-Pérez A, Thorball C, Ruiz R, et al. A metagenome-wide association study of HIV disease progression in HIV controllers. *Iscience*. 2023;26(7).
4. Caceres GA, Scambray KA, Malee K, Smith R, Williams PL, Wang L, et al. Relationship between brain structural network integrity and emotional symptoms in youth with perinatally-acquired HIV. *Brain Behav Immun*. 2024;116:101-113.