

Understanding the Epidemiology, Pathogenesis and Prevention of HIV/AIDS: An Overview

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Abstract: AIDS was first reported in the United States in 1981 and has since become a major worldwide epidemic. AIDS is caused by the human immunodeficiency virus (HIV). By killing or damaging cells of the body's immune system, HIV progressively destroys the body's ability to fight infections and certain cancers. AIDS is caused by HIV infection and is characterized by a severe reduction in CD4+ T cells, which means an infected person develops a very weak immune system and becomes vulnerable to contracting life-threatening infections (such as *Pneumocystis carinii* pneumonia). AIDS occurs late in HIV disease. The HIV-1 pandemic is a complex mix of diverse epidemics within and between countries and regions of the world, and is undoubtedly the defining public-health crisis of our time. Our aim of this study to give an overview about the impacts of AIDS on the world population extracted based on previous studies.

Keywords: HIV, AIDS, virus, body's ability, damaging cells, body's immune system.

1. INTRODUCTION

AIDS or acquired immunodeficiency syndrome, fatal disease caused by a rapidly mutating retrovirus that attacks the immune system and leaves the victim vulnerable to infections, malignancies, and neurological disorders. It was first recognized as a disease in 1981. The virus was isolated in 1983 and was ultimately named the human immunodeficiency virus (HIV). There are two forms of the HIV virus, HIV-1 and HIV-2. The majority of cases worldwide are caused by HIV-1. In 1999 an international team of genetic scientists reported that the strain of HIV-1 responsible for most cases of AIDS.

Early in the U.S. HIV/AIDS pandemic, the role of substance abuse in the spread of AIDS was clearly established. Injection drug use (IDU) was identified as a direct route of HIV infection and transmission among injection drug users. The biggest gathering of right on time AIDS cases included gay and promiscuous men (alluded to as men who engage in sexual relations with men (or MSMs). Early instances of HIV infection that were sexually transmitted often were identified with the utilization of liquor and different substances, and the dominant part of these cases happened in urban, instructed, white MSMs.

At present, infusion drug clients speak to the biggest HIV-contaminated substance-mishandling populace in the United States. HIV/AIDS predominance rates among infusion drug clients differ by geographic area, with the most elevated rates in studied substance misuse treatment focuses in the Northeast, the South, and Puerto Rico. From July 1998 through June 1999, 23 percent of all AIDS cases reported were among men and ladies who reported IDU (Centers for Disease Control and Prevention [CDC], 1999b). Human immunodeficiency virus (HIV) is a noteworthy general wellbeing challenge. Unjustified requires the separation of patients with HIV infection may facilitate compel the potential for development of clinical administrations to manage a more noteworthy number of such patients. HIV/gained safe insufficiency syndrome (AIDS) infectious disease that can evoke irrational emotions and fears in health care providers. HIV/AIDS is a global epidemic; the majority of individuals living with HIV/AIDS are in sub-Saharan Africa. It is a main source of death in that district and a genuine general wellbeing issue, with southern Africa being the most influenced. Sub-Saharan Africa is the main part of the world where HIV pervasiveness and AIDS passing's are higher for ladies than for men. The sexual orientation measurement is in this way basic to seeing how HIV is spread: the idea encourages an examination of how men's and ladies' parts build defenselessness to the malady. In each general public, guys and females, who by nature are naturally distinctive, are required to act in endorsed ways. In a few societies in southern Africa, men are required to have numerous accomplices, while ladies are relied upon to be monogamous; the time of marriage is often lower for females than for guys, and men are relied upon to have more youthful sexual accomplices.

2. METHODOLOGY OF STUDY

Searching for relevant articles and reports for this review covered the period up to 2015 included in the following databases and sources: • The Cochrane Library • Google Scholar • CINAHL • PUBMED • HRH Global Resource Center • USAID Development Experience Clearinghouse • World Health Organization • Human Resources for Health Journal.

To perform as broad a search as possible, we utilized the search term “HIV AND AIDS.” we will be reviewing each of the abstracts identified. Data extracted from each abstract included the study’s objective, methodology, and key findings. The geographic region of the study was also recorded. Then we have developed a set of exclusive and inclusive categories in which to place each of the articles. Categories were created to facilitate summarizing the state of the literature on defining, epidemiology, pathogenesis and preventing of HIV/AIDS.

3. RESULTS

HIV viral infectious pathogenesis:

HIV pervasiveness is expanding overall since individuals on antiretroviral treatment are living longer, albeit new diseases diminished from 3.3 million in 2002, to 2.3 million in 2012. Worldwide AIDS-related passings topped at 2.3 million in 2005, and diminished to 1.6 million by 2012. An expected 9.7 million individuals in low-salary and center pay nations had begun antiretroviral treatment by 2012. New bits of knowledge into the instruments of inert disease and the significance of supplies of contamination may in the long run lead to a cure. The part of resistant actuation in the pathogenesis of non-AIDS clinical occasions (real reasons for grimness and mortality in individuals on antiretroviral treatment) is getting expanded acknowledgment. It is imagined that these cells in this manner come back to the completely tranquil state, in which they are shielded from the cytopathic impacts of monstrous viral replication. All primate lentiviruses (HIV-1, HIV-2, SIV) encode Nef proteins, which are essential for viral replication and pathogenicity in vivo. It is not known how Nef directs these procedures. It has been proposed that Nef shields tainted cells from apoptosis and acknowledgment by cytotoxic T lymphocytes. Different studies propose that Nef impacts the actuation condition of the tainted cell, in this manner improving the capacity of that cell to bolster viral replic. Most HIV replication is thought to take place in activated CD4+ T lymphocytes in lymphoid tissue, other cell populations may become infected and may play important roles in the persistence of HIV infection. Resting T cells constitute a huge store of idle HIV that might be actuated to finish the replication endless supply of the host cell. Toward one side of the range, in the initiated T cell, various cellular components and the viral Tat protein upregulate HIV transcription, bringing about viral creation and eventually obliteration of the host cell. At the flip side of the range, completely tranquil T cells, ie, those in the G0 period of the cell cycle, are unequipped for supporting productive HIV replication, due to blocks in reverse transcription (Stevenson M, et al. 2003) as well as inability to enter the nucleus of the resting cell. early evidence (Unutmaz D, et al. 2004) indicates that, between those extremes, Lentiviral vectors have been supported to be viable vehicles for the conveyance and stable articulation of qualities in nondividing essential cells. On the other hand, certain cell sorts, for example, resting T lymphocytes, are impervious to contamination with HIV-1. Building up parameters for stable quality conveyance into essential human lymphocytes and ways to deal with conquer the resistance of resting T cells to HIV disease might allow potential quality treatment applications, hereditary investigations of essential cells in vitro, and a superior comprehension of the phases of the lentiviral life cycle.

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Role of Immune Activation:

HIV seems to thrive on immune activation. Indeed, chronic immune activation is a hallmark of HIV disease and results in increased viral replication and immune cell depletion, immune cell dysfunction, and aberrant lymphocyte turnover. In addition to endogenous factors, for example, the impacts of proinflammatory cytokines, exogenous elements, including the immediate cooperation between the HIV envelope and different cell sorts and the impacts of other tainting microorganisms, are connected with uplifted cellular enactment and consequently might effectsly affect HIV ailment

pathogenesis (Fauci AS, et al.2005) Treating coinfections that possibly expand safe initiation and give a lenient situation to HIV replication is a promising, pathogenesis-related way to deal with forestalling HIV sickness. Specifically, there is significant epidemiologic confirmation for a connection between the vicinity of other sexually transmitted maladies, especially genital-ulcer ailments, and the danger of HIV transmission (Galvin SR, et al.2004) Recent studies have fortified the proof for this affiliation. For instance, in a 7-year forthcoming partner study of acute HIV infection in Pune, India, (Reynolds et al.2003,2006) reported that subjects with recent or incident syphilis had a >4-fold increased risk for HIV acquisition. This increased risk was strong after controlling for other sexual risk behaviors. In an earlier study in Pune, this team found that recent incident herpes simplex virus-2 (HSV-2) infection was associated with a ~4-fold increased risk of HIV acquisition

Reducing Transmission by Reducing Viral Load:

Many pathogenesis- related preventive measures concentrate on diminishing the viral burden as a way to render a HIV-tainted individual less irresistible. The most direct approach is the treatment of tainted people with blend antiretroviral treatment, which, in a dominant part of people, can diminish plasma levels of infection to imperceptible levels. Convincing proof that diminishing viral burden decreases transmission originates from investigations of maternal-fetal transmission (US Department of Health and Human Services).

Prevention:

Prevention efforts can be divided into four broad categories: those offered to HIV-1–negative subjects, particularly those in high-hazard bunches; those offered to individuals with solid probability of presentation to HIV-1 yet before such introduction; those offered to individuals not long after presentation; and those offered to individuals who are as of now tainted (auxiliary anticipation) (Figure1). Also, powerful anticipation systems have been created to diminish mother-to-youngster transmission of HIV-1 contamination (Dao H., et al. 2007) and to diminish blood transmission of HIV-1 through use of sensitive and reliable screening methods (Stramer S.L., et al.2004).

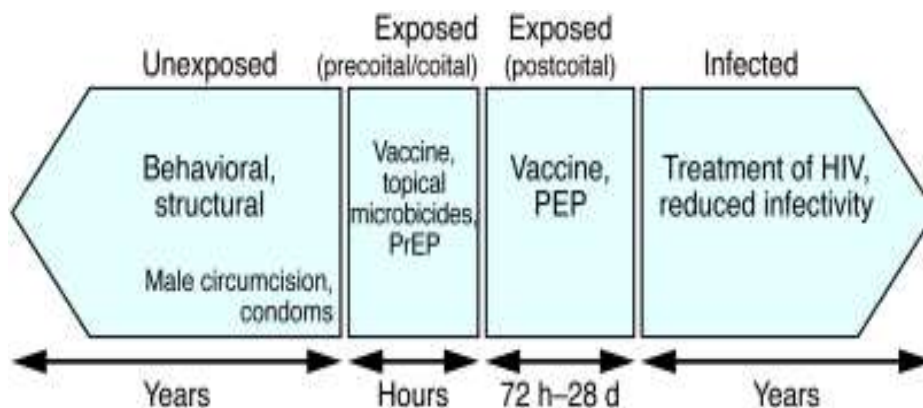


Figure1. Opportunities for preventing infection with HIV-1

Behavioral prevention methods:

Behavioral mediations were the first counteractive action routines to be comprehensively actualized. These intercessions have concentrated on sexual restraint (Underhill K, et al.2004), postponed sexual presentation, diminished quantities of sexual accomplices, routine condom utilize, and lessened needle sharing or clean needle use among infusion drug clients (Des Jarlais D.C, et al. 2007). On the other hand, investigations of some single behavioral intercessions, for example, restraint just projects in high-salary nations, have neglected to indicate generous advantage on HIV-1 hazard practices or organic results (Stoneburner R.L, et al. 2004). Decreases in HIV-1 pervasiveness in numerous nations, including the US, Australia, Brazil, Thailand, Uganda, Kenya, and Zimbabwe, have been credited to blends of behavioral mediation procedures.

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