Short Communication

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THREE DECADES OF HIV/AIDS EPIDEMIC

Mohammad Yunus Ansari[1] and Asif Ansari[2]*

[1]International Centre for Genetic Engineering & Biotechnology (ICGEB), New Delhi, India
[2]Zuleikhabai Valy Md (ZVM) Unani Medical College & Hospital, Gultekdi, Mukund Nagar, Pune, Maharashtra, India

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Abstract: Human immunodeficiency virus was discovered 30 years ago in 1983. The virus was found to be associated with acquired immunodeficiency syndrome, which is characterized by sharp decrease in CD4+ T cell count, followed by development of cancer, metabolic disorders and opportunistic infection. After few years of its discovery HIV spread all over the globe and became a major threat to public health. Total of 35.3 million people are living with HIV infection across the globe. The purpose of this review is to discuss the HIV/AIDS epidemic, treatment and future prospects.

Key Words: HIV, AIDS, Epidemic

INTRODUCTION

Human immunodeficiency virus (HIV) was discovered in early 1980s when patient having severe immunological problems suddenly started to increase in numbers in some parts of United States and Europe [1, 2]. This new kind of syndrome was characterized by lymphadenopathy, opportunistic infection and certain types of cancers like Kaposi's sarcoma and was named acquired immunodeficiency syndrome (AIDS) [3]. Till now HIV has spread all over the globe and claimed more than 30 millions of lives. HIV/AIDS has no cure, so only awareness among the individuals about the virus, mode of transmission and precaution can stop further infection.

The HIV/AIDS epidemic is worldwide. HIV/AIDS is more prevalent in south and western African countries with HIV prevalence rate as high as 15-28%. According to the 2013 report of world health organization (WHO) a total number of 35.3 million people are living with HIV worldwide with 2.3 million fresh infection cases in 2012. In India alone 2.1 million people are living with HIV infection at the end of 2012 [4]. As per the 2013 guidelines of WHO, about 29 million people are eligible for antiretroviral therapy but almost 19 million do not have access to it [4].

Human immunodeficiency Virus

HIV is a member of genus lentivirus, which belongs to the family retroviridae [3]. HIV contains two copies of single stranded, positive sense RNA genome and an outer envelop. Upon entry into host cells the RNA genome is converted into complementary DNA (cDNA) by a process called reverse transcription by viral encoded enzyme, reverse transcriptase. The free viral genome in the form of cDNA is called as provirus that eventually gets integrated into host genomic DNA by HIV encoded integrase and other host factors. The integrated viral DNA becomes a part of the host cell, undergoes active transcription producing large amount of viral proteins and RNA genome that finally get packaged into progeny viruses. The integrated viral genome may remain silent and the virus becomes latent which poses a bigger threat to HIV clearance. HIV has been classified into two groups, a highly infectious and pathogenic HIV-1 and low pathogenic HIV-2. HIV-2 is less infectious and is restricted to western parts of Africa whereas HIV-1 occurs globally. HIV-1 is further grouped into three main groups: M, O and N. HIV infects the cells of immune system mainly CD4+ T helper cells but it can also infect other cell types including macrophages and dendritic cells [3, 5]. HIV attacks the immune system of the host and weakens the defense system against infections.

AIDS: features

AIDS is the most advanced stage of HIV infection. HIV/AIDS remains one of the most significant public health concern claiming more than 30 million lives since its discovery in 1980s [4]. Hallmark of HIV infection and progression to AIDS is a sharp decrease in CD4+ T cell population in circulation. HIV infection has two phages; acute phage which is characterized by fever, headache, sore throat and flue like symptoms [6]. Followed by acute phage is a long chronic phage with an incubation period of 8-12 years. During chronic phage the virus remains latent and there is a continuous decrease in CD4+ T cell population to below 350 cells/ul. At the later stage of HIV infection the individuals can easily be infected by opportunistic pathogens or develop certain types of cancers, metabolic diseases or other kinds of clinical manifestations which are feature of AIDS [1].

***Corresponding Author:**
Dr. Asif Ansari,
Associate professor,
Z.V.M. Unani Medical College,
Pune, India.

Virus transmission, Prevention and Treatment

Transmission of HIV occurs through blood transfusion from infected individual, through other body fluids like semen, breast milk or vaginal secretion, through injections among drug addicts or sex with infected individual [7]. After the discovery of antiretroviral drugs the number of fresh infection and death due to AIDS has reduced significantly and the life expectancies of individuals infected with HIV has increased. According to UNAIDS-WHO report, 2013, total numbers of individuals living with HIV were 30 million at the end of 2001, 33.2 million at the end of 2007 and 35.3 million at the end of 2012 [4]. The increased number of HIV individual is not because the number of fresh infection cases has increased but because HIV positive individuals on highly active antiretroviral therapy (HAART) have increased life span. The numbers of fresh infection cases have reduced from 3.4 million in 2001 to 2.3 million in at the end of 2012 [4]. The death toll also reduced from 1.9 million in 2001 to 1.6 million in 2012. It has been shown that HAART can prevent further transmission of virus [8, 9]. Testing blood for the presence of HIV before transfusion is helpful in preventing virus transfer [10]. There is no cure of HIV. Once an individual is infected by HIV he/she carries it for whole life. The only available treatment so far is antiretroviral drugs that control the virus production and transmission [7].

DISCUSSION

HIV/AIDS epidemic is one the most important public health related issue worldwide. Antiretroviral drugs have been proven to reduce viral production, transmission and progression to AIDS but still there is no cure or vaccine available to end this epidemic. A big number of infected individuals particularly in developing countries do not have access to HAART [4]. Beside antiretroviral drugs have many side effects and people on HAART for long time are developing serious metabolic manifestation and early symptoms of aging and aging related problems [7, 11, 12]. Recently cases of drug resistant HIV variants have been reported [13, 14]. There is further requirement of research in drug development that has lesser or no side effects and can control drug resistant variants of HIV.

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