

MECHANISM OF DEVELOPMENT OF HIV INFECTION

Khudoyberdiyeva Nilufar Bozorovna

nilufarxudoyberdiyeva7718@gmail.com

Teacher of the Termez State Pedagogical Institute

Hasanova Baktigul Asqarovna

Student of Termez State Pedagogical Institute

Annotation: This article on the mechanism of HIV infection provides detailed information about the spread of the virus, its entry into the body, and immune responses. The article helps to understand the pathogenesis of the infection.

Keywords: HIV, infection, pathogenesis, immune response.

HIV, or Human Immunodeficiency Virus, was first identified in the early 1980s. The virus weakens the human immune system, reducing its ability to fight various infections and cancers. The first cases of HIV infection were reported in the United States in 1981, when there was no known history of the virus. HIV infection spread most widely among men who inject drugs and have sex with men. The spread of the virus quickly became a global problem. In the 1980s, the increasing number of deaths related to HIV infection, as well as the social and economic impact of the virus, became a matter of public concern. The spread of HIV infection also exacerbated social problems such as sexual relations and drug abuse. On the other hand, it was necessary to disseminate information about HIV infection and take preventive measures. Scientific research and treatment developed in 1983 when the virus that caused HIV was discovered. The advent of antiretroviral therapy (ART) methods in 1996 was an important step in improving the quality of life for people living with HIV infection. HIV infection has become one of the most serious health problems on a global scale. In many countries, the effects associated with HIV infection, especially on the African continent, have created significant economic and social problems. Statistics related to the spread of HIV infection are updated every year, and this information plays a key role in the development of coping strategies by states and international organizations. The history of HIV infection manifests itself as a complex process that has influenced the social, economic and health system of mankind. To combat the spread of this virus and its consequences, global cooperation and knowledge sharing are essential. The history of HIV infection and its impact on humanity is constantly studied through experiments and scientific research. HIV infection was diagnosed in the early 1980s, which originally originated in the United States. The spread of the virus quickly went

global and became a public health threat problem in many countries. The spread of HIV occurs mainly through sex, through the blood and through the transition from mother to child. In the early days, HIV infection caused many people to lose their lives, causing great fear and stigma in society. With the help of innovations in medicine and antiretroviral therapy, the chances of living with HIV have increased. However, the spread of the virus and its adverse effects still remain relevant as a global health problem. Measures and knowledge related to HIV infection continue to be increased. The transition of HIV from the RNA genome to DNA is important in the life cycle of the virus, since at this stage the virus integrates into the cell genome and thus makes the cell itself part of the virus-producing factory.

Biological properties of HIV

The structure of the HIV virus is complex and specific. The Virus consists primarily of a double-layered lipid membrane and an RNA genome internally, which is a unique feature of the RNA genome that distinguishes it from other viruses. There are three main genes in the genetic material of HIV: gag, pol and env. The Gag gene forms the structure of the virus and its capsid, while the pol gene controls viral replication and cell entry mechanisms. The Env gene, on the other hand, plays an important role in The Binding of the virus to receptors on the cell surface. HIV is particularly known for its ability to bind to CD4 receptors, which allows access to the T-cells of the virus. The life cycle of the virus is divided into four main stages: cell entry, replication, Assembly, and release. The mechanism of entry of HIV into cells is very complex and requires certain processes. The Virus first binds to the CD4 receptor, and then interacts with many helper receptors, such as CCR5 or CXCR4. As a result of these bonds, the virus penetrates the cell membrane through direct interaction. Within the cell, the RNA genome of the virus is converted to DNA using reverse transcriptase, which is necessary for viral replication. The transition of HIV from the RNA genome to DNA is important in the life cycle of the virus, since at this stage the virus integrates into the cell genome and thus makes the cell itself part of the virus-producing factory. And the differentiation of the virus from other viruses lies in its high mutation rate. There are frequent changes in the genetic material of HIV, which increases its ability to evade the immune system. Also, mutations in HIV form drug resistance, which creates difficulties in the treatment process. Such biological properties make HIV more relevant as a global health problem and require the development of new strategies to prevent its spread. A better understanding of the biological properties of HIV is important to improve the effectiveness of the fight against the virus. The HIV virus is distinguished from other viruses by its complex structure and genetic characteristics. The structure of the virus, consisting of double-stranded RNA, requires specific

mechanisms in its replication process. The genome of HIV, which includes different genes and their interactions, provides the evolutionary variability of the virus. The life cycle of the virus begins with the mechanism of entry into the cells, in the process of which the virus, attaching to the membrane of the host cell, enters it and deposits its own genetic material. This process is important in understanding the mechanism by which HIV spreads.

Entry of HIV infection into the body

The entry of HIV infection into the body consists of several stages, a process that involves the entry of the virus into the host cell and its impact on the immune system. The HIV virus mainly affects T-lymphocytes, in particular CD4+ T-cells, which are the main cells of human immunity. The entry of the virus into the body usually occurs through the blood, in ways such as sexual intercourse or the passage of an infected mother to the child. In order for the Virus to attach to the membrane of the host cell, first of all, special proteins located on its surface, such as gp120 and gp41, play an important role. These proteins interact with the host cell'S CD4 receptor to ensure that the virus enters the cell.

HIV, which enters the cell, integrates its genetic material into the DNA of the host cell. This process is necessary for the virus to replicate within the cell and produce new viral particles. The integration process of HIV leads to the fact that the virus takes control of the cell and, as a result, the cell ceases to perform its normal functions. The presence of the virus also affects other components of the immune system, weakening the body's defense mechanisms. In individuals with HIV infection, the number of CD4+ T-cells decreases, which reduces the effectiveness of the immune system and weakens the body in relation to various infections. During HIV infection, the virus continues its life cycle to produce new viral particles. This process proceeds through the intracellular proliferation of the virus and its subsequent spread to new cells. HIV, stopping the strengthening of the immune system and cell growth, causes the development of various diseases in the body. In the prevention and treatment of HIV infection, it is important to have a good understanding of the process by which the virus enters the body and develop strategies to combat it. Thus, the entry of HIV infection into the body indicates not only the mechanism of spread of the virus, but also the weakening of the immune system. The entry of HIV infection into the body usually occurs through sexual intercourse, blood, or transmission between mother and child. The Virus first enters T-helper cells, one of the important cells of the immune system. HIV binds to and contains these cells via CD4 receptors, resulting in viral proliferation. This process leads to a weakening of the immune system, as T-helper cells provide the body's ability to fight infections. The spread of HIV and the weakening of the immune system lead

to the development of infections, which has a huge impact on the health system. Such processes indicate the complexity of HIV infection and its difficulties in treatment.

Stages of development of HIV infection

There are several stages in the development of HIV infection, a process that extends from the acute to the AIDS stage. After HIV infection enters the human body, in the first stage there is an acute infection of the virus. During this period, the patient usually develops flu-like symptoms, such as high temperature, headache, muscle pain, and swollen lymph nodes. These symptoms reflect the effects of the virus on the body's immune system and often make this stage difficult to identify as they can be associated with many other diseases. After acute infection, the virus becomes more common and goes into a latent period in the human body, which can lead to a deterioration in the health of the individual infected with the infection. During the latent period, viral replication continues and puts pressure on the CD4+ T cells of the immune system. During this period, the patient can be free from many symptoms, but the virus remains active in the body. In the process of continuing this phase, the virus shows its variability and gains an advantage in fighting immune system responses. At this stage, patients often feel healthy, but the virus continues to function secretly in the body. Subsequently, HIV-infected individuals progress to the AIDS stage as a result of weakened immune systems. AIDS, that is, the syndrome of HIV-related diseases, is characterized by a serious weakening of the immune system. At this stage, patients are at risk of developing various opportunistic infections and cancers. This level of weakening of the immune system is one of the most dangerous outcomes of HIV infection, as patients can fall into a more severe state than normal diseases. Therefore, the identification and monitoring of the stages of development of HIV infection is important in the development of treatment strategies. Proper analysis and treatment at each stage of HIV infection can help improve the patient's quality of life. The process of development of HIV infection consists of several stages, starting with the acute infection.

In the acute infection stage, along with the entry of HIV into the patient's body, the virus begins to multiply and affect the immune system. At this stage, the patient often feels flu-like symptoms.

The next stage is a period of clinical instability, during which the patient may feel better, but the virus is actively present in the body. After this stage, as the infection continues, the immune system weakens and this leads to the stage of AIDS.

AIDS bosqichida immun tizimi juda zaiflashadi, natijada turli infeksiyalar va saraton kabi kasalliklar rivojlanish xavfi oshadi.

At each stage of HIV infection, the need to determine and treat the patient's condition increases. The first stage in the development of HIV infection is acute, during

which changes in the immune system begin as the virus enters the body. During the later stages, the virus increases and weakens immunity, resulting in an increased risk of progression to AIDS. At each stage, it is important to observe the appearance of clinical signs and the patient. The stages of development of HIV infection are a complex process. From the moment of accution, after the virus enters the body, symptoms may appear in the first stage, but often these symptoms disappear on their own. When HIV infection persists, the immune system of patients weakens, which leads to difficulties in combating various infections. An important role in this process is played by the reproduction of the virus and its spread in the body. In the later stages, that is, during the specific course of HIV infection, the emergence of clinical signs and the process of controlling the health of patients becomes more important. The transition to the AIDS stage, on the other hand, is caused by a severe weakening of the immune system, which increases the patient's risk of developing various diseases. Therefore, at each stage of HIV infection, it is very important to carefully monitor patients and provide the necessary medical care.

Conclusion:

In conclusion, the global impact of HIV infection is a widespread problem on a global scale, and its economic and social consequences are of serious importance. This infection has changed the lives of millions of people around the world, negatively affecting their health and economic situation. Individuals living with HIV often face social isolation and discrimination, which negatively affects their psychological state and social integration.

Thus, the impact of HIV infection on developmental mechanism has a serious impact not only on human health, but also on its economic and social condition. Complex approaches and multilateral strategies are necessary to solve this problem.

REFERENCES

1. Gallo, R. C., & Montagnier, L. (2003). The discovery of HIV as the cause of AIDS.
2. UNAIDS. (2021). Global AIDS Update 2021.
3. Fauci, A. S., & Lane, H. C. (2019). HIV AIDS: A Global Perspective.
4. Cohen, M. S., et al. (2011). Antiretroviral Therapy for the Prevention of HIV-1 Transmission.
5. WHO. (2020). HIV/AIDS Fact Sheet.
6. El-Sadr, W. M., & Justman, J. (2008). AIDS in Africa—What the US Should Know.
7. De Cock, K. M., et al. (2009). The HIV Epidemic in Sub-Saharan Africa.
8. Smith, R. A., & Smith, J. (2015). Advances in HIV Treatment and Prevention.