

Overview of Acquired Immunodeficiency Syndrome (AIDS): A Chronic Condition Caused by Human Immunodeficiency Virus (HIV)

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ABSTRACT

HIV/AIDS is a serious health issue everywhere in the world. This comes from a virus called HIV, which makes the immune system weaker. HIV can be spread through sex without a condom, sharing dirty needles, and other ways. It fights against CD4 cells and makes the immune system less strong. Reaching the final stage of AIDS means get sick from infections. Antiretroviral therapy helps to manage the virus and make life better. Although things have gotten a little better, unfair treatment is still happening and it's making it difficult for people to get the healthcare they need. Ongoing research is putting in a lot of effort to create a vaccine for HIV. We all need to work together all over the world to fight HIV/AIDS, understand it better, and keep finding better treatments.

Introduction

Mechanism of action, HIV/AIDS

HIV attacks the body's defense system, especially the T cells that help fight infections. Moving from having HIV to getting AIDS involves the virus and the immune system working together in a complicated way. HIV attacks certain types of cells in the body, like CD4 T cells, macrophages, and dendritic cells. The HIV virus sticks to the CD4 receptor on cells in the body. The virus uses CCR5 or CXCR4 receptors to get into the body. The virus breaks down and enters the cell, bringing its genetic material with it. The virus's genetic material changes from RNA to DNA with the help of reverse transcriptase. The viral DNA becomes part of the host cell's genetic material. The virus DNA mixes with the cell's DNA using a special enzyme called integrase. After joining together, the virus's genes can stay inactive or start making new virus parts. The cell's tools turn the virus's DNA into mRNA. Viral proteins are created using the host cell's ribosomes and other parts of the cell. A new virus is created when virus proteins and RNA come together. The new viruses leave the host cell and get a covering from the cell's membrane. This could kill the cell it's in. The protease cuts the virus particles to help them mature. This is a very important step for the virus to spread. The virus can get into new CD4 cells and begin the process all over again [1].

Transmission of HIV/AIDS

HIV is mostly spread through some body fluids that have a lot of the virus. It is important to know a disease spreads in order to stop it from spreading. The most common ways that HIV spreads are through having sex without using protection, sharing needles or other equipment for injecting drugs, and from a mother to her baby during childbirth or breastfeeding.

Unprotected Sexual Contact

Vaginal, Anal, and Oral Sex: Having sex without using condoms or other protection can allow bodily fluids like blood, semen, vaginal fluids, and rectal fluids to be exchanged, and this may pass on the virus.

Contaminated Blood and Blood Products

Using drugs with needles that are shared with others can spread HIV because the blood is exchanged directly. Before blood banks started doing thorough testing, it used to be a big way for diseases to spread through blood transfusions. But now, with strict screening rules in place, it is very rare for diseases to spread this way.

Mother-to-Child Transmission

HIV can pass from a mom with HIV to her baby when she's pregnant if the virus goes through the placenta and gets into the baby's blood. The virus can be passed to the baby during birth by coming into contact with blood and other body fluids. HIV can spread to a baby through breastfeeding if the mother has HIV. In certain places, experts suggest using different ways to feed babies to lower the chances of spreading illness. Accidentally getting pricked by a needle or coming into contact with blood that has HIV in a healthcare setting can make healthcare workers get HIV. Using medical equipment like needles or syringes again or not cleaning them properly can help HIV to spread. Using equipment that is not sterile or that is shared can be risky if it is contaminated with HIV-infected blood. Having sex with many partners or having unprotected sex with someone who has HIV makes it more likely to get infected [2].

Sign and symptom of HIV/AIDS

HIV infection can cause different symptoms, but some people may not have any symptoms for a long time. The signs of HIV can be different at different times in the infection. HIV infection has three stages: early infection, a period with no symptoms, and then a stage with severe symptoms called AIDS.

Acute HIV Infection

Many people feel sick like they have the flu 2 to 4 weeks after getting the virus. During this stage, typical symptoms may include. Fever, Feeling tired, Headache, Body aches and joint pain, swollen lymph nodes, Sore throat, Rash.

Clinical Latency (Chronic HIV Infection)

After the first strong phase, the virus goes into a phase where it reproduces slowly. During this time, people may not feel any symptoms, but the virus keeps harming the body's ability to fight off infections. During this phase, some people may have mild symptoms or swollen lymph nodes that last for a long time.

Advanced HIV Infection (AIDS)

As the sickness gets worse and the body's ability to fight off germs becomes very weak, more serious symptoms and infections can happen. These signs show that the person is getting AIDS. Some common signs and symptoms of late-stage HIV infection are: Losing a lot of weight quickly, getting sick often with fevers or night sweats, feeling very tired for no reason, having swollen lymph nodes for a long time, having diarrhea that won't go away, getting white spots or weird sores in your mouth, getting rashes or bumps on your skin, having problems with your memory and thinking, having a cough and trouble breathing a lot, getting infections often like tuberculosis, pneumonia, and fungus [3].

Protection of HIV/AIDS

Preventing HIV/AIDS means doing things to lower the chances of getting HIV from someone else. These steps are important for people who don't have HIV and for people who do have HIV to stop spreading the virus to others.

Safer Sex Practices

Condom Use: Using condoms every time you have vaginal, anal, or oral sex can greatly lower the chances of getting HIV.

Pre-Exposure Prophylaxis: For people who are at high risk of getting HIV, PrEP means taking a medication every day to stop the infection.

Testing and Knowing Your Partner's Status

Regular HIV Testing: It's really important to know if you or your partner(s) have HIV. It's important to get checked regularly for STDs, especially if you do risky things or aren't sure if your partner has STDs.

Couples Testing: Testing and counseling for couples can help them learn about and handle their chances of getting HIV together.

Contraception and Family Planning

Barrier Methods: Using things like condoms can protect you from getting pregnant or getting HIV.

Support for Those Living with HIV

Adherence to Treatment: People with HIV should take their medicine as the doctor tells them to so they can stay healthy and lower the chances of passing the virus to someone else [4].

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Sexual transmitted diseased

It looks like there could be a mistake in your question. Sexually transmitted diseases are sicknesses that you can get from having sex with someone who has the sickness. It can be spread from different kinds of sex like vaginal, anal, or oral sex. These sicknesses can come from germs like bacteria, viruses, or parasites.

Chlamydia

Chlamydia trachomatis, a gram-negative bacterium, serves as the etiological agent of the sexually transmitted infection chlamydia. The manifestations of the condition may often be asymptomatic; however, they may also include symptoms such as genital discharge, dysuria, and abdominal pain. Chlamydia that remains untreated has the potential to lead to the development of pelvic inflammatory disease (PID) in women and infertility in both men and women.

Gonorrhea

The cause of the condition is the bacteria *Neisseria gonorrhoeae*. Signs and Symptoms: The symptoms are similar to chlamydia, like having a discharge from the genitals and pain when urinating. If you don't get treatment for gonorrhea, it could lead to pelvic inflammatory disease, not being able to have babies, and the infection spreading to other parts of your body.

Syphilis

Treponema pallidum, a bacterium, is a notable species within the microbial realm. Initially, painless lesions are present. Subsequently, a rash manifests on the skin. Adverse consequences such as cardiovascular and neurological impairment may ensue as a result of this condition. Complications may result in the development of significant health problems if appropriate measures are not implemented.

Herpes (HSV - Herpes Simplex Virus)

The etiology of the condition is linked to the herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2). Clinical Presentation: Painful ulcers or vesicles in the genital or oral region, concomitant with influenza-like symptoms during the primary incident.

Human Papillomavirus (HPV)

The reason for the condition is connected to the Human Papillomavirus. HPV infections often don't show any signs, but some types can lead to genital warts or raise the chances of getting cervical and other cancers. Having human papillomavirus can cause cervical cancer, other genital cancers, and breathing problems.

Hepatitis B and C

The sickness is caused by Hepatitis B and Hepatitis C viruses. Each person can have different symptoms of the disease. Some people might not feel sick, but others may feel tired, have yellow skin, or have pain in their belly. Hepatitis B and C can make our liver hard and scarred, and may also cause liver cancer if not treated for a long time.

Treatment of HIV/AIDS

Treating HIV/AIDS means using a medicine called antiretroviral therapy. This medication is a combination of different drugs that help stop the virus from spreading in the body. Although there is no cure for HIV right now, using effective ART can help lower the amount of virus in the body and keep the immune system healthy. Getting the right treatment can make people with HIV/AIDS feel better, have fewer symptoms, and have a better life. ART lowers the chance of getting sick from infections that can take hold when the immune system is weak.

Key components of HIV/AIDS treatment include

Antiretroviral Medications

Usually, it means using at least three different antiretroviral drugs from different groups to attack the virus at different times in its life cycle. Use drugs like nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, protease inhibitors, integrase inhibitors and entry inhibitors. It's really important to always take your medication as your doctor tells you to when you're on ART. Not taking medicine as prescribed can make the medicine stop working and cause the treatment to not work. It's important to keep track of the amount of virus in your body, the number of CD4 cells, and your overall health to see if the treatment is working and to make any changes if needed. People with HIV/AIDS may need to take extra medicine to prevent infections, like antibiotics or antifungal drugs. Making good choices like eating healthy, staying active, and not smoking or drinking too much can help you feel better overall.

Affects body part by HIV/AIDS

The Human Immunodeficiency Virus makes the body's defense system less strong against sickness and diseases. HIV mostly attacks a specific type of white blood cell known as CD4 T cells. HIV weakens the immune system by making the CD4 cells not work well. People with a weak immune system are more likely to get sick and have other health issues.

Lymph Nodes

Site of Viral Replication: Lymph nodes are very important for the body's defense system, and they are where viruses can multiply. HIV multiplies in lymph nodes and spreads throughout the body.

Bone Marrow

Hematopoiesis Disruption: HIV can stop the bone marrow from working right and affect the making of different types of blood cells, like CD4 T cells.

Central Nervous System (CNS)

Neurological Complications: HIV can get into the brain and cause different problems with the nervous system. This could cause problems with thinking, remembering things, and other brain-related symptoms.

Gastrointestinal Tract

Opportunistic Infections: HIV/AIDS can cause problems in the stomach and intestines, like infections from viruses and bacteria.

Respiratory System

Opportunistic Infections: HIV/AIDS can make more likely to get lung infections like PCP and TB.

Skin and Mucous Membranes

Skin problems, lesions inside the mouth, and other skin issues can happen because of HIV/AIDS or related infections.

Cardiovascular System

Increased Risk: People with HIV/AIDS might be more likely to have heart problems like blocked arteries and heart attacks [5].

Conclusion

HIV/AIDS is a big health problem that affects lots of people all over the world. Progress has been made in testing, treating, and preventing HIV, especially with the use of antiretroviral therapy. However, ongoing negative opinions make it difficult to make progress, showing the importance of widespread understanding and teaching. Research for an HIV vaccine is going well. We all need to work together globally to address the social, economic, medical, and mental health aspects of the epidemic. By including everyone, stopping the spread, and making sure everyone can get treatment, we can work towards a future where HIV/AIDS is under control and finally gone.

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