

Difference Between AIDS and Autoimmune Disease

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Key Difference – AIDS vs Autoimmune Disease

Autoimmunity is an adaptive immune response mounted against self-antigens and the diseases caused by such responses are called the autoimmune diseases. AIDS is the end stage of HIV infection. In the absence of proper treatment, death occurs in 2-3 years. **While AIDS is an infectious venereal disease caused by the HIV virus, autoimmune diseases are caused due to different alterations in the immune system which are triggered by the exposure to various exogenous and endogenous antigens.** This is the major difference between AIDS and autoimmune disease.

What is AIDS?

HIV/AIDS

The first description of AIDS took place in 1981, followed by identification of the organism in 1983. 35 million people are estimated to be living with HIV infection worldwide. HIV has been transformed from a universally fatal infection into a long-term manageable condition with the introduction of highly active Anti-Retroviral Therapy. Prevalence of HIV in Sub-Saharan Africa is seriously high, whereas, in Eastern Europe and part of Central Asia, the affected rates continue to rise. According to current statistics, 38% of people living with HIV are on ART, although for each individual starting therapy, there are two new infections diagnosed.

Transmission of Infection

Although HIV can be isolated from a wide range of body fluids and tissues, transmission mainly occurs via semen, cervical secretions, and blood.

1/. Sexual Intercourse (vaginal and anal)

Heterosexual intercourse accounts for the majority of infections globally. Transmission of HIV seems to be more efficient from men to women and to the receptive partner in anal intercourse.

2/. Mother-to-Child Transmission (transplacental, perinatal, breastfeeding)

In children, the most common route of vertical transmission of HIV infection is this. Although the majority of the infections take place perinatally, transmission of the infection can occur in utero. The risk of vertical transmission is said to be doubled by breastfeeding.

3/. Contaminated Blood, Blood Products, and Organ Donations

Before the screening of blood products was introduced, HIV infection was associated with the use of clotting factors and with blood transfusion.

4/. Contaminated Needles (IV drug misuse, injections, and needle-stick injuries)

In South East Asia, Latin America and Eastern Europe, the practice of sharing needles and syringes for IV drug use continue to be a major route of HIV transmission. Following a single-stick injury with known HIV positive blood, health care workers have a risk of approximately 0.3%.



Pathogenesis

The basis of pathogenesis of HIV disease is the interrelationship between HIV and the host immune system. HIV is caused by HIV1 and HIV 2. These are retroviruses. Pathogenic effect of HIV1 is more than HIV 2. HIV infects CD4 T

lymphocytes. An increase in HIV viral load leads to a reduction in the CD4 count and an increase in CD8 T lymphocytes.

Primary HIV Infection

It is a transient condition, which is symptomatic in 40-90%. It is characterized by a rapid rise in viremia over 1000000/ml, decrease in CD4 T lymphocytes count and a large increase in CD 8 T lymphocytes. Signs and symptoms of the infection appear 2-4 weeks following exposure, and it will persist for about 2 weeks. This infection may mimic acute infectious mononucleosis. This phase is characterized by a maculopapular rash and mucosal ulcerations.

Chronic Asymptomatic Phase

Primary infection is followed by a long period of clinical latency, which is of about 10 years. It is characterized by relatively stable viral replication and CD4 counts. Clinical signs and symptoms usually do not appear at this phase.

Overt AIDS

This is the end stage of HIV infection. In the absence of proper treatment, death occurs in 2-3 years. When the CD4 T cell count declines below 50,000/ml, the risk of death and opportunistic infections increases.

Malignancies Associated with AIDS

- Kaposi's sarcoma
- Non-Hodgkin's lymphoma
- Primary cerebral lymphoma

Diagnosis

- Serology; ELISA, Western blot
- Virus detection by PCR
- Antigen detection; viral p24 antigen

Treatments

- Nucleoside analog reverse transcriptase inhibitors – Zidovudine, didanosine
- Non-nucleoside analogue reverse transcriptase inhibitors -Nevirapine
- Protease inhibitors – Indinavir, Nelfinavir

- Present approach; Combined treatment of HAART

What are Autoimmune Diseases?

Autoimmunity is an adaptive immune response mounted against self-antigens. As in a normal immune response, the antigen presentation elicits a rapid proliferation of T and B cells which are responsible for the activation of effector mechanisms. But while the normal immune responses try to eliminate exogenous antigens from the body, autoimmune responses aim at eliminating a specific variety of endogenous antigens from our biological systems.

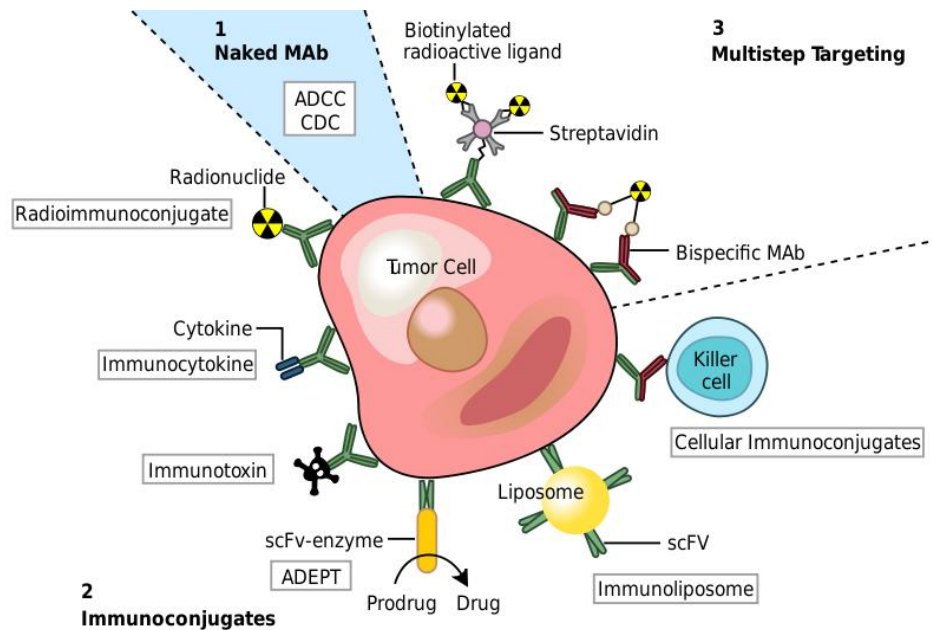
Few common autoimmune diseases and the autoantigens that give rise to them are enumerated below.

- Rheumatoid arthritis – synovial proteins
- SLE – nucleic acid
- Autoimmune hemolytic anemia – Rhesus protein
- Myasthenia gravis – choline esterase

There are two main categories of autoimmune diseases

- Organ-specific autoimmune diseases -Type I diabetes mellitus, Graves disease, multiple sclerosis, Good pasture syndrome
- System specific autoimmune diseases – SLE, Scleroderma, Rheumatoid arthritis

As previously mentioned, an autoimmune response is mounted against self-antigens. But it is impossible to completely eliminate these intrinsic molecules with antigenic properties from our body. Therefore autoimmune diseases cause a chronic tissue damage because of the repeated attempts to get rid of the self-antigens.



Why are Only Some Affected?

During the development of T cells, they are made tolerant to self-antigens. However, in some people this tolerance is either lost or disrupted because of genetic and environmental factors, giving rise to autoimmunity.

There are several defense mechanisms that promote the apoptosis of the self-reactive T cells. Despite these countermeasures, some self-reactive cells can remain in our body. In a genetically susceptible individual under the appropriate environmental conditions, these cells get activated resulting in an autoimmune disease.

What are the Similarities Between AIDS and Autoimmune Diseases?

- Both conditions affect the immune system of the body.

What is the Difference Between AIDS and Autoimmune Diseases?

AIDS vs Autoimmune Diseases

AIDS is the end stage of HIV

Autoimmunity is an adaptive immune response

infection.	mounted against self-antigens.
Cause	
AIDS is caused by the HIV virus.	Autoimmune diseases are caused by exogenous or endogenous antigens that trigger the immune system of the body.
Transmission	
Transmission of the virus can happen from person to person via body fluids.	Autoimmune diseases are not transmissible.
Genetic Predisposition	
There is no genetic predisposition.	There is a genetic predisposition.
Diagnosis	
<p>Diagnosis of the disease is made through,</p> <ul style="list-style-type: none"> · Serology; ELISA, Western blot · Virus detection by PCR · Antigen detection; viral p24 antigen 	The investigations used in the diagnosis of autoimmune diseases vary according to the site of origin of the disease.
Management	
Antiretroviral agents are used in the management of AIDS.	Anti-inflammatory drugs are frequently used in the management of autoimmune diseases.

Summary – AIDS vs Autoimmune Diseases

AIDS is the end stage of HIV infection whereas autoimmune diseases are the diseases caused as a result of an adaptive immune response mounted against self-antigens. AIDS is an infectious disease whereas autoimmune diseases are noninfectious diseases whose pathogenesis is triggered by various exogenous and endogenous agents. This is the major difference between AIDS and autoimmune diseases.

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