



OIV INFEKSIYASINING IMMUN TIZIMIGA TA'SIRI VA ZAMONAVIY ANTIRETROVIRUS TERAPIYA

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Annotatsiya

Mazkur ilmiy maqolada OIV infeksiyasining inson immun tizimiga ko'rsatadigan ta'siri, CD4 limfotsitlarining kamayishi, opportunistik infeksiyalar rivojlanishi hamda zamonaviy antiretrovirus terapiyaning samaradorligi tahlil qilinadi. Shuningdek, OIVning organizmda ko'payish mexanizmi, kasallik bosqichlari va davolashning zamonaviy usullari yoritilgan

Kalit so'zlar: OIV, OITS, immun tizimi, CD4 limfotsit, antiretrovirus terapiya, opportunistik infeksiya, revers transkriptaza, integraza

1. KIRISH

Odam immunitet tanqisligi virusi (OIV) zamonaviy tibbiyotning eng dolzarb muammolaridan biri hisoblanadi. Ushbu virus inson immun tizimini zararlab, organizmning himoya mexanizmlarini asta-sekin zaiflashtiradi. Natijada organizm oddiy infeksiyalar va o'smalarga qarshi kurashish qobiliyatini yo'qotadi. Dunyo bo'yicha millionlab insonlar OIV bilan yashamoqda va bu kasallik ijtimoiy, iqtisodiy hamda tibbiy jihatdan katta muammo bo'lib qolmoqda.

Zamonaviy antiretrovirus terapiya yordamida kasallikning rivojlanishini sekinlashtirish, bemorning umr davomiyligini oshirish va hayot sifatini yaxshilash



mumkin. Ushbu maqolada OIVning tuzilishi, immun tizimiga ta'siri, kasallik bosqichlari va zamonaviy davolash usullari batafsil ko'rib chiqiladi.

2. OIVNING TUZILISHI VA XUSUSIYATLARI

OIV Retroviridae oilasiga mansub RNK saqlovchi virus hisoblanadi. Virusning asosiy nishoni CD4 retseptorlariga ega T-helper limfotsitlardir. Virus organizmga kirgach, immun hujayralarga birikadi va o'z genetik materialini hujayra ichiga kiritadi. Revers transkriptaza fermenti virus RNKsini DNKga aylantiradi, so'ngra virus DNKsi mezbon hujayra genomiga integratsiyalanadi.

Virusning asosiy tarkibiy qismlari:

- RNK genetik materiali
- Kapsid oqsili
- Lipid qobiq
- Revers transkriptaza fermenti
- Integraza fermenti
- Proteaza fermenti

3. OIVNING IMMUN TIZIMIGA TA'SIRI

OIV asosan CD4 T-limfotsitlarini zararlaydi. Ushbu hujayralar immun tizimining markaziy boshqaruvchilari bo'lib, ular yo'qolishi organizmni jiddiy xavf ostiga qo'yadi. Kasallik rivojlangan sari bemorda sil, kandidoz, pnevmoniya va boshqa og'ir kasalliklar kuzatilishi mumkin.

CD4 hujayralari kamayishi oqibatlar:

1. Organizmning infeksiyalarga qarshi himoyasi pasayadi



2. Opportunistik infeksiyalar rivojlanadi
3. O'smalar paydo bo'lish xavfi ortadi
4. Immun tizim izdan chiqadi

4. OIV INFEKSIYASINING BOSQICHLARI

4.1. O'tkir bosqich

Virus organizmga tushgandan keyingi dastlabki haftalarda kuzatiladi. Grippga o'xshash simptomlar: isitma, holsizlik, limfa tugunlari kattalashishi, tomoq og'rig'i.

4.2. Latent bosqich

Bu bosqich bir necha yil davom etishi mumkin. Bemor o'zini sog'lom his qilishi mumkin, biroq virus organizmda faol ko'payishda davom etadi. Bu bosqichda kasallik tarqalishi xavfi yuqori.

4.3. OITS bosqichi

CD4 hujayralari juda kamayib ketganda OITS rivojlanadi. Ushbu davrda og'ir opportunistik infeksiyalar va xavfli o'smalar (Kaposhi sarkomasi, limfomalar) paydo bo'ladi.

5. ZAMONAVIY ANTIRETROVIRUS TERAPIYA

Antiretrovirus terapiya (ART) OIVni to'liq yo'q qilmasa-da, virus ko'payishini samarali nazorat qiladi. Davolash natijasida virus yuklamasi kamayadi va immun tizimi tiklana boshlaydi. Kombinatsiyalangan terapiya bir vaqtning o'zida bir nechta preparat qo'llanilishini nazarda tutadi.

Antiretrovirus preparatlar guruhleri:

- Nukleozid revers transkriptaza ingibitorlari (NRTI)



- Non-nukleozid revers transkriptaza ingibitorlari (NNRTI)
- Proteaza ingibitorlari (PI)
- Integraza ingibitorlari (INSTI)
- Kirish ingibitorlari

6. PROFILAKTIKA CHORALARI

OIV infeksiyasining oldini olish muhim ahamiyatga ega. Erta diagnostika va muntazam davolanish kasallik asoratlarini kamaytiradi.

- Xavfsiz jinsiy hayot
- Steril tibbiy asboblardan foydalanish
- Donor qonini tekshirish
- Aholining tibbiy savodxonligini oshirish
- Homilador ayollarni skriningdan o'tkazish

7. XULOSA

OIV infeksiyasi inson immun tizimini chuqur zararlovchi xavfli virusli kasallik hisoblanadi. Virus CD4 limfotsitlarini zararlashi natijasida organizmning himoya qobiliyati susayadi va opportunistik kasalliklar rivojlanadi. Zamonaviy antiretrovirus terapiya yordamida virus faoliyatini nazorat qilish, bemor umrini uzaytirish va hayot sifatini yaxshilash mumkin. Shu sababli erta diagnostika, profilaktika va zamonaviy davolash usullarini keng qo'llash katta ahamiyat kasb etadi.



THE EFFECT OF HIV INFECTION ON THE IMMUNE SYSTEM AND MODERN ANTIRETROVIRAL THERAPY

Abstract

This scientific article discusses the effect of HIV infection on the human immune system, the decrease of CD4 lymphocytes, the development of opportunistic infections, and the effectiveness of modern antiretroviral therapy. The mechanism of viral replication in the body, stages of the disease, and contemporary treatment approaches are examined in detail.

Keywords: HIV, AIDS, immune system, CD4 lymphocytes, antiretroviral therapy, opportunistic infections, reverse transcriptase, integrase, viral load.

1. INTRODUCTION

Human Immunodeficiency Virus (HIV) represents one of the most pressing challenges in modern medicine. The virus attacks the human immune system, progressively weakening the body's defense mechanisms. As a result, the organism loses its ability to fight ordinary infections and malignancies. Millions of people worldwide are currently living with HIV infection, making it a significant public health concern.

Modern antiretroviral therapy makes it possible to slow the progression of the disease, extend patient life expectancy, and substantially improve quality of life. This article provides a comprehensive review of HIV structure, its impact on the immune system, disease stages, and current treatment strategies.

2. STRUCTURE AND CHARACTERISTICS OF HIV

HIV belongs to the family Retroviridae and is an RNA-containing virus. Its primary target is the CD4 receptor-bearing T-helper lymphocytes. Upon entering the body, the virus binds to immune cells and introduces its genetic material into the host cell. The enzyme reverse transcriptase converts viral RNA into DNA, which



subsequently integrates into the host cell genome, establishing a permanent reservoir.

Major structural components of HIV:

- RNA genetic material
- Capsid protein
- Lipid envelope
- Reverse transcriptase enzyme
- Integrase enzyme
- Protease enzyme

3. EFFECT OF HIV ON THE IMMUNE SYSTEM

HIV primarily targets CD4 T-lymphocytes, which serve as the central coordinators of the immune response. As CD4 cell counts decline, the body becomes increasingly susceptible to opportunistic

pathogens. Patients may develop tuberculosis, candidiasis, pneumonia, and other serious conditions that a healthy immune system would normally control.

1. Reduced protection against infections
2. Development of opportunistic infections
3. Increased risk of malignancies
4. Progressive immune system failure

4. STAGES OF HIV INFECTION

- 4.1. Acute Stage



Observed during the first weeks after infection. Flu-like symptoms may appear including fever, fatigue, lymphadenopathy, and sore throat. Viral load is typically very high at this stage.

4.2. Latent (Chronic) Stage

May persist for several years. The patient may feel healthy, but the virus continues to replicate actively in the body. Without treatment, the disease will eventually progress to AIDS. Transmission risk remains present throughout this stage.

4.3. AIDS Stage

Develops when CD4 counts fall critically low (below 200 cells/mm³). Severe opportunistic infections and malignancies such as Kaposi's sarcoma and lymphomas appear during this stage.

5. MODERN ANTIRETROVIRAL THERAPY

Antiretroviral therapy (ART) does not eliminate HIV entirely but effectively controls its replication. Treatment results in reduced viral load and gradual immune system recovery. Combination therapy — using multiple drug classes simultaneously — is the current gold standard and minimizes the risk of drug resistance.

- Nucleoside Reverse Transcriptase Inhibitors (NRTIs)
- Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIs)
- Protease Inhibitors (PIs)
- Integrase Strand Transfer Inhibitors (INSTIs)
- Entry/Fusion Inhibitors



6. PREVENTIVE MEASURES

- Safe sexual practices
- Use of sterile medical instruments
- Screening of donated blood
- Improving public health literacy
- Screening of pregnant women

7. CONCLUSION

HIV infection is a dangerous viral disease that profoundly damages the human immune system. The destruction of CD4 lymphocytes reduces the body's defensive capacity and leads to

opportunistic disease. Modern antiretroviral therapy enables effective viral suppression, extends patient lifespan, and markedly improves quality of life. Consequently, early diagnosis, preventive measures, and widespread application of contemporary treatment modalities are of paramount importance in the global response to HIV.

FOYDALANILGAN ADABIYOTLAR / ЛИТЕРАТУРА / REFERENCES

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