

**RELEVANCE OF ANTIRETROVIRAL THERAPY FOR HIV INFECTION  
PREVENTION**

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**Abstract.** With the advent of antiretroviral therapy (ART), HIV infection has become a therapeutically controllable disease. Despite this, there is a complex epidemic situation with HIV infection. Antiretroviral therapy leads to a significant reduction in the risk of sexual transmission of HIV.

**Keywords:** HIV infection, early antiretroviral therapy, treatment as prevention.

## **INTRODUCTION**

With the advent of antiretroviral therapy (ART), HIV infection has become a therapeutically controllable disease [1]. Despite all the successes in this area, the spread of HIV infection has currently acquired the character of a large-scale epidemic. According to UNAIDS, 36.9 (34.3–41.4) million HIV-infected people are registered in the world, of which 2 million were infected in 2014 [2].

Initiation of antiretroviral therapy (ART) is recommended as soon as possible after diagnosis of HIV. Barriers to care should be addressed, including ensuring access to ART and adherence support. Integrase strand transfer inhibitor-containing regimens remain the mainstay of initial therapy. For people who have achieved viral suppression with a daily oral regimen, long-acting injectable therapy with cabotegravir plus rilpivirine given as infrequently as every 2 months is now an option. Weight gain and metabolic complications have been linked to certain antiretroviral medications; novel strategies to ameliorate these complications are needed. Management of comorbidities throughout the life span is increasingly important, because people with HIV are living longer and confronting the health challenges of aging. In addition, management of substance use disorder in people with HIV requires an evidence-based, integrated approach. Options for preexposure prophylaxis include oral medications (tenofovir disoproxil fumarate or tenofovir alafenamide plus emtricitabine) and, for the first time, a long-acting injectable agent, cabotegravir. Recent global health emergencies, like the SARS-CoV-2 pandemic and monkeypox virus outbreak, continue to have a major effect on people with HIV and the delivery of services. To address these and other challenges, an equity-based approach is essential.

## **MATERIALS AND METHODS**

The spread of HIV infection has a multifactorial destructive impact on all economic entities: deterioration of demographic indicators, decreased work capacity, increased government

spending on health care and social security [4]. The term "treatment as prevention" implies the prescription of ART following the diagnosis of "HIV infection" ("test and treat"), regardless of the number of CD4 lymphocytes. In 2000, Quinn et al. published data showing that the probability of HIV-negative partners becoming infected directly depends on the viral load level in the blood of HIV-positive partners [5]. The probability of HIV transmission is also associated with the viral load level in urogenital tract secretions [6]. Antiretroviral drugs suppress HIV RNA replication in the blood and genital secretions [7].

## RESULTS AND DISCUSSION

The HPTN 052 study demonstrated that HIV transmission in discordant couples is reduced by 96% if the HIV-infected partner is taking ART [8]. In addition, this study demonstrated a significant advantage of early ART over delayed ART. Of the 28 cases of HIV-negative partner infection, 27 cases were in the group where ART for the HIV-positive partner was delayed compared to the group where the HIV-positive partner received early ART [9]. A meta-analysis of 9 observational and one randomized study conducted in 2014 also confirmed the effectiveness of antiretroviral therapy as a method of preventing HIV infection in discordant couples [10].

Early ART reduces the incidence of opportunistic infections and mortality among HIV-infected people [11, 12]. In the phase III HPTN 052 study mentioned above, the incidence of adverse outcomes (development of AIDS, tuberculosis, non-AIDS-defining diseases) was compared in patients with early ART (immediately after inclusion in the study) and delayed ART (with a decrease in CD4 lymphocytes <250 cells/ $\mu$ l or the development of secondary diseases). The results of the study, published in 2021, showed that early ART reduces the incidence of secondary diseases and associated mortality, as well as mortality not associated with AIDS-defining diseases [13]. The loss of total human capital as a result of death from HIV infection is higher than from any other cause, including road traffic accidents, suicide, stroke and heart attack [4].

The theoretical benefit of early ART must be weighed against the possible risks that arise from long-term drug use: late toxic effects and the development of HIV resistance to antiretroviral drugs. In addition, the need for lifelong drug use and strict adherence to the treatment regimen (high adherence to therapy) are important conditions for effective ART. And finally, to implement the "test and treat" strategy, treatment must be accessible.

To resolve the above problems, it is necessary to create affordable drugs with a high resistance profile that meet safety and ease of use criteria, which in turn will have a positive effect on patient adherence to treatment. Most HIV treatment protocols use the CD4 count as a basis for ART initiation. Based on available data, it is necessary to shift the timing of treatment initiation toward ART initiation at higher CD4 counts. The table presents current recommendations for ART initiation [19–22].

## CONCLUSION

In the context of the ongoing HIV epidemic, effective measures aimed at preventing HIV infection are required. ART leads to a significant reduction in the risk of sexual transmission of HIV. In addition, the concept of "treatment as prevention" has convincing evidence of the

benefits of early ART for maintaining health and reducing mortality among HIV-infected people. Improving the epidemic situation with HIV infection will reduce the socio-economic damage caused by this disease.

#### LITERATURES

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