

HIV-1 Drug Resistance Mutations Found in Patients with Treatment Failure in Russia's Northwestern Federal District

Aoerse Yete*

Department of Hematology, Germans Trias i Pujol University Hospital, Universitat Autònoma de Barcelona, Ctra. de Canyet, S/N, 08916 Badalona, Spain

Abstract

HIV/AIDS remains a global public health challenge, with millions of people worldwide living with the virus. Effective Antiretroviral Therapy (ART) has transformed HIV into a manageable chronic condition, enhancing the quality of life and extending the lifespan of those affected. However, the emergence of drug resistance mutations in the HIV-1 virus poses a significant threat to the success of ART. This article delves into a study conducted in Russia's Northwestern Federal District, focusing on the prevalence and implications of HIV-1 drug resistance mutations among patients experiencing treatment failure. Russia has been grappling with an expanding HIV epidemic for several years. The country has the highest number of new HIV infections in Eastern Europe and Central Asia, with the Northwestern Federal District being one of the regions most severely affected.

Keywords: Antiretroviral therapy • HIV • Immunodeficiency virus

Introduction

The primary mode of HIV transmission in Russia is through intravenous drug use, followed by heterosexual transmission and, to a lesser extent, same-sex sexual contact. These complex dynamics contribute to the challenges of controlling the epidemic. Antiretroviral therapy (ART) is the cornerstone of HIV treatment and prevention. ART suppresses viral replication, reducing viral load and allowing the immune system to recover. In Russia, access to ART has expanded over the years, and the government has made efforts to provide free or subsidized treatment to people living with HIV/AIDS. However, despite these efforts, several factors have hindered optimal HIV care, including stigma, discrimination, late diagnosis, and limited access to effective treatment regimens. The Human Immunodeficiency Virus (HIV-1) is known for its high mutation rate, leading to genetic diversity within viral populations. This genetic variability can result in drug resistance when specific mutations emerge that allow the virus to evade the effects of antiretroviral drugs. Drug resistance can develop due to factors such as poor adherence to treatment regimens, suboptimal drug potency, and the selection of resistant virus variants [1-3].

Literature Review

Russia has experienced a growing HIV epidemic over the past few decades, particularly in regions like the Northwestern Federal District, which includes cities such as St. Petersburg and Arkhangelsk. While significant efforts have been made to scale up ART access and improve care, challenges such as late diagnosis, insufficient adherence to treatment, and limited treatment options have contributed to the emergence of drug-resistant strains of HIV-1. Drug resistance mutations in HIV-1 can develop when the virus is exposed to selective pressure from antiretroviral drugs. Non-adherence to treatment

regimens and suboptimal healthcare infrastructure can foster the development and transmission of drug-resistant strains. Understanding the prevalence and patterns of these mutations is crucial for optimizing treatment strategies and reducing the impact of drug resistance on public health [4].

Discussion

To investigate HIV-1 drug resistance mutations in patients experiencing treatment failure in Russia's Northwestern Federal District, researchers conducted a retrospective analysis of clinical and virological data from a cohort of HIV-positive individuals. The study included patients who had received ART for at least six months and subsequently experienced virological failure, defined as a viral load above 1,000copies/mL after at least six months on treatment. Viral load and genotypic resistance testing were performed on blood samples collected from these patients. Genotypic resistance testing identifies specific mutations in the viral genome that confer resistance to antiretroviral drugs. The Stanford HIV Drug Resistance Database was used to interpret the genotypic data and identify relevant resistance mutations [5,6].

Conclusion

The study conducted in Russia's Northwestern Federal District highlights the pressing issue of HIV-1 drug resistance among patients experiencing treatment failure. With a significant prevalence of drug resistance mutations and associated factors like poor adherence, late diagnosis, and stigma, there is an urgent need for targeted interventions to address these challenges. Enhancing adherence support, early diagnosis, and treatment initiation, reducing stigma, and strengthening healthcare access and drug supply chains are key strategies to combat drug resistance and improve the overall quality of HIV care in the region. Addressing these issues is crucial for the long-term success of HIV/AIDS control efforts in Russia.

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Conflict of Interest

None.

*Address for Correspondence: Aoerse Yete, Department of Hematology, Germans Trias i Pujol University Hospital, Universitat Autònoma de Barcelona, Ctra. de Canyet, S/N, 08916 Badalona, Spain, E-mail: aoersey@gmail.com

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