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Opinion Article

Insights on Immune Deficiency Gene Delivery

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ABOUT THE STUDY

Since the beginning of the AIDS epidemic, treating HIV-related non-lymphoma Hodgkin's (HIV-NHL) has been difficult. Prior to the introduction of Highly Active Antiretroviral Therapy (HAART) in the management of these patients, the prognosis of HIV-NHL was poor, despite a high response rate, due to aggressive tumor behavior, increased hematological toxicity, and a high rate of Opportunistic Infections (OIs). Since the widespread use of HAART, the prognosis of HIV-NHL has improved, with better chemotherapy tolerance, a higher Complete Remission (CR) rate, a significant improvement in Disease-Free Survival (DFS), and a significant reduction in the number of deaths related to HIV complications. Many studies have shown that the CHOP regimen (cyclophosphamide, doxorubicin, vincristine, and prednisone) is the standard approach for patients with aggressive NHL in HIV, despite the fact that a recent general population study demonstrated that rituximab plus CHOP was superior to CHOP alone in patients with CD20-positive diffuse large B-cell NHL. Furthermore, some promising results in HIV-NHL have been reported using a protracted schedule that can overcome tumor cell resistance to cytotoxic agents.

The Human Immunodeficiency Virus (HIV) was isolated, identified, and characterized shortly after the first description of the Acquired Immune Deficiency Syndrome (AIDS) in 1981. Since then, a remarkable amount of experimental work has been carried out, and no one could have predicted the development of such a large body of knowledge relating to virus infection during those early years. Much of the knowledge gained in HIV research and testing has been transferred to and extrapolated to other human chronic virus infections, such as those caused by the hepatitis B and C viruses. Because of the efforts made at the time, and especially more recently, we now know that HIV infection can be controlled, and it has been announced that the life expectancy of HIV-infected patients is the same as that of seronegative patients for the first time in more than 25 years of broad-based research. Many HIV-infected patients are now in their second decade of Active Antiretroviral Therapy (ART), which typically consists of a combination of three of the more than 25 currently licensed antiretroviral drugs that allow plasma viremia suppression to be sustained below the detection limits of currently available assays.

However, as is customary in science, the more remarkable the new discoveries and the faster they are accomplished, the greater the number of subjects that must be addressed. Indeed, many aspects of HIV infection remain unknown, and as research progresses, new and more intriguing issues that raise new and fascinating questions come to the attention of researchers.

In terms of clinical virology, we now know how to correctly identify infected people using very sensitive and appropriate assays, as well as how to properly follow-up on the course of infection, primarily by measuring CD4 cells and HIV-RNA loads in the blood. There are several tests available for quantitative HIV-RNA detection, including End-Point PCR, NASBA, TMA, branched-DNA, and Real-Time-PCR. All of these tests have high sensitivity and throughput, allowing HIV infections to be monitored from the very beginning. The sensitivity of the virus to different drugs and its bio/virological characteristics can be measured both before and during therapy by studying and identifying the virus's phenotype. and by nucleic acid sequencing, which looks for specific mutations in the viral genome that are linked to drug resistance or a specific phenotype.

The remarkable ability of HIV to mutate, on the other hand, poses significant challenges not only for the development of effective vaccine and eradication therapeutic strategies, but also for diagnostic and monitoring strategies. Virologic assays continue to evolve to meet the needs of HIV-infected patients and their management, and their use in clinical virology is now recognized as playing a critical role in HIV disease management. This theme section addresses the issues mentioned above and attempts to provide current information on the clinical and diagnostic usefulness of the current methods of addressing them.

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