INTRODUCTION

At least four types of human retroviruses are currently identified. They are causally involved in several different kinds of diseases in humans, including leukemia and lymphoma immunodeficiency diseases and neurologic and central nervous system diseases. Their identification has led to the ability to easily detect them and to a basic understanding of their life cycle. This knowledge makes possible various strategies for prevention and treatment of diseases due to infection by these viruses.

HUMAN RETROVIRUSES

The first human retrovirus was identified from a cutaneous T-cell lymphoma and was called human T-cell leukemia virus (later, type I) (HTLV-I)\(^1\). This virus is endemic to certain parts of the world, including parts of Africa, southwestern Japan, the southeastern United States and the Caribbean, and has been shown to be the etiologic agent for adult T-cell leukemia (ATL) and tropical spastic paraparesis, a central nervous system disease somewhat similar to multiple sclerosis. Infection by HTLV-I also leads to immunosuppression, occasionally causing a disease clinically indistinguishable from the acquired immunodeficiency syndrome (AIDS), and appears to be able to indirectly cause B cell lymphomas, probably by chronic immune stimulation. The second human retrovirus was isolated from a patient with a T-cell variant of hairy cell leukemia after being identified by a serologic cross-reactivity with HTLV-I and was called HTLV-II\(^2\).
HTLV-II does not appear to be nearly as prevalent as HTLV-I and is not currently associated with any disease, although its true distribution may be obscured somewhat by the difficulty in easily distinguishing it from HTLV-I. The third human retrovirus originally called HTLV-III but currently called HIV-1 (for human immunodeficiency virus type 1) is the cause of the current AIDS pandemic. A fourth type of human retrovirus, which is distantly related to HIV-1 but is closely related to a retrovirus in African monkeys, and which has been called LAV-2 and HTLV-4, has been identified and is widely distributed in Western Africa. Viruses of this group, which has recently been designated HIV-2, seem to cause AIDS, but much less efficiently than HIV-1. Further study is needed to clarify this point, however. For a more complete review of these viruses, see reference 8.

PREVENTION

The first line of prevention comes from knowledge about the mode of transmission of these viruses. All seem to be transmitted in the same manner, namely by exchange of body fluids. Thus, transmission can be sexual, by transfusion of blood products and by intravenous drug abuse. Avoidance of sexual promiscuity and the use of condoms can limit sexual transmission; avoiding the sharing of unsterilized needles can eliminate transmission by the route of drug abuse. Assays which detect the presence of viral antibodies in blood products have greatly decreased the possibility of transmission by transfusion, although a small percentage of infected people (those recently infected, for example) may be antibody-negative. Use of all the above practices, however, can greatly limit the further spread of all of these viruses.

A future way to prevent spread of these viruses is the development of vaccines. This would seem to be particularly urgent in the case of HIV-1. There are some problems, however. For one thing, the envelope protein of HIV-1 shows an unusually great degree of strain variability and this will probably have to be taken into account in the design of a vaccine. Secondly, even though infected individuals have low levels of neutralizing antibody to HIV-1, this does not appear to be protective against disease, and it may be that humans cannot elaborate an effective immune response to the virus.