

Foreword

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THE CLINICAL SYNDROME OF PRIMARY HIV INFECTION WAS RECOGNIZED and documented in 1985, about two years after the initial identification of the causative agent of AIDS. By 1991 it was known that this symptomatic period is associated with an explosive replication of the virus, which is then partially controlled as the illness resolves spontaneously. Reports in 1993 further showed the population of HIV during this early period of infection to be quite homogeneous, in distinct contrast to the diverse quasispecies that are typically found in chronically infected persons. This observation suggested not only the presence of selective forces operating during HIV transmission, but also the greater likelihood of therapeutic success in treating early infection.

Advances made in the ensuing two years demonstrated that as the primary syndrome ends, HIV and the infected host usually reach equilibrium, as reflected by a prolonged, stable concentration of virus in the plasma. This steady-state level of viremia has been colloquially termed the virologic setpoint. Through a series of therapeutic interventions to perturb the virus-host equilibrium, we have determined that plasma viremia was in fact maintained by a highly dynamic process of de novo virus infection of T-lymphocytes balanced by an equally rapid turnover of infected cells. In other words, throughout the course of infection, massive levels of virus production were matched by comparably fast rates of viral clearance. Furthermore, it would be revealed later that this relentless replication of HIV was closely linked to a heightened pace of CD4+ cell destruction. Taken together, these findings formed the foundation for the therapeutic principle, articulated in 1995, that we must "hit HIV, early and hard" with our antiretroviral agents. Although this principle remains sound today, its implementation in practice must be tempered by

the growing awareness of side effects arising from the antiviral drugs.

By 1996 several cohort studies had nicely defined the prognostic importance of the virologic setpoint, i.e., the higher the value, the worse the outcome. Additionally, we learned for the first time the importance of host factors, such as the CCR5 genotype, in influencing the setpoint. In 1999 it was determined by two sets of experiments done in SIV-infected monkeys that plasma viremia levels increased dramatically when CD4+ cells were depleted by specific monoclonal antibodies, thereby showing convincingly the prominent role played by cell-mediated immunity in controlling virus replication in vivo. More recently, there is accumulating evidence to suggest that antibody responses represent another strong controlling force on HIV replication, although the virus is continually mutating to escape from the selective pressure.

By now there should be little doubt that the outcome of pri-

mary HIV infection determines the eventual prognosis of the infection. Thus, it is prudent that every clinician who manages patients in this field learn about this critical phase of infection as well as its attendant clinical and epidemiologic issues. In this monograph, Physicians' Research Network has endeavored to assemble a collection of papers that help to address this need. Included herein is an article that discusses approaches to making a proper diagnosis of acute HIV infection based on clinical manifestations and laboratory testing. Two separate articles deal with the impact of the high levels of viremia during this period on the dynamics of the epidemic spread. Lastly, two other papers address how therapeutic interventions, either sustained or intermittent, could be used to lower the virologic setpoint and hence improve prognosis.

Although no specific treatment recommendations could be made at this time, current therapeutic studies in primary HIV infection must remain a focus for researchers and practitioners alike. I have no doubt that as this research field matures, it will come to light that acute HIV infection also offers a unique opportunity for us to learn a great deal about kinetics of the initial viral spread *in vivo*, and about the rates of onset of specific immune responses directed against HIV. 

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