Immune responses elicited by recombinant vaccinia-human immunodeficiency virus (HIV) envelope and HIV envelope protein: analysis of the durability of responses and effect of repeated boosting

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ABSTRACT
Previous studies indicate that immunization with recombinant (r) vaccinia-human immunodeficiency virus type 1 (HIV-1) gp160 and boosting with baculovirus-derived HIV-1 rgp160 results in stronger cellular and antibody responses than those following either vaccine alone. The durability of immunity over 1 year was evaluated in 12 recipients. Both cellular and binding antibody responses remained detectable but diminished, and neutralizing antibodies were absent. To boost immunity, rgp160 was given again 1 year after the initial boost. Reboosting elicited strong HIV-specific lymphoproliferative responses. Binding antibody levels also rose dramatically, and the magnitude of the peak responses was significantly greater following the 2-year than following the 1-year boost. However, neutralizing antibody titers were low (1:10–1:20) and detected in only 4 of 12 persons. Moreover, persistent CD8+ cytolytic responses were not induced. Thus, although repeated rgp 160 boosting after vaccinia-envelope priming can augment selected immune components, an altered regimen may be necessary to achieve protective long-term immunity to HIV-1.

Induction of humoral and cell-mediated anti-human immunodeficiency virus (HIV) responses in HIV sero-negative volunteers by immunization with recombinant gp160


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ABSTRACT
Development of an effective vaccine for prevention of infection with HIV would provide an important mechanism for controlling the AIDS epidemic. In the current study, the first clinical trial of a candidate HIV-1 vaccine initiated in the United States, the safety and immunogenicity of escalating doses (10-1,280 micrograms) of recombinant gp160 (rgp160), were evaluated in 138 HIV-negative volunteers. Maximal antibody responses, as evaluated by ELISA, were seen after immunization with three doses of 1,280 micrograms rgp160. Responses to some specific epitopes of HIV gp160, including the second conserved domain and the CD4 binding site, were seen more frequently than after natural infection. Neutralizing antibodies to the homologous HIV strain, but not heterologous strains, were induced by this regimen. Blastogenic responses to rgp160 were seen in most volunteers receiving at least two doses of > or = 20 micrograms. These envelope-specific T cell responses were also seen against heterologous strains of HIV. No major adverse reactions were seen after immunization. Thus, rgp160 is a safe and immunogenic candidate HIV vaccine; further studies are needed to determine if it will provide any clinical benefit in preventing HIV infection.