Retrovirology

Poster presentation

P18-06. Increased HIV-specific immunity in HIV-infected individuals vaccinated with a DNA prime, rAd5 boost regimen

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Background

The Vaccine Research Center has developed a 3 DNA prime, recombinant adenovirus serotype 5 vector (rAd5) boost vaccination regimen that is immunogenic in HIV-uninfected individuals. Vaccination of HIV-infected individuals with potent immunogens offers the possibility of enhancing the magnitude, quality, and breadth of response compared to existing HIV immunity.

Methods

Seventeen HIV-infected men on HAART with undetectable viral loads (<50 copies/ml) and $CD4^+$ T cells counts >350 cells/mm^3 were enrolled in VRC 101. Eleven of 12 subjects randomized to the vaccination arm completed all immunizations; one did not receive the rAd5 boost. Four of 5 placebo recipients completed mock immunizations. Sixteen subjects completed 48 weeks of follow-up; 1 control subject discontinued after Week 36. Immunologic effects of vaccination were assessed based on the difference between pre-vaccination and 1 month post-rAd5 boost responses.

Results

Vaccination of HIV-infected individuals was well-tolerated; reactogenicity was similar to that seen in HIV-uninfected individuals. Viral loads remained undetectable in all but one vaccinee who showed transient low level virema (<100 copies/ml) during this study. No change in $CD4^+$ T cell count was apparent in either controls or vaccinees. Vaccination induced significant increases in the frequency of IFN-gamma ELISpot response to Clade B Gag ($P < 0.005$), Pol ($P < 0.05$), and Clade A ($P < 0.005$), B ($P < 0.005$), and C Env ($P < 0.05$) overlapping 15 mer peptides. This increase was in part due to an increase in number of epitopes recognized. IFN-gamma ELISpot responses to Clade B Nef, not targeted by Ad5 boost vaccination, were not significantly increased in vaccinees. No significant change was observed in controls.

Conclusion

Pre-existing HIV-specific T cells responses can be safely boosted with existing vaccine products. The magnitude of these responses is large enough to allow the comparison of pre-existing responses to vaccine-induced responses at specific optimized epitopes and allow a systematic approach to the study of therapeutic vaccination in HIV-infected individuals.