HIV Control in a Cohort of South African Women

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Introduction

In the majority of people HIV infection without ART leads to AIDS and death, but HIV controllers show that it is possible for the immune system to robustly control the virus. Understanding what mediates viral control in these rare individuals may provide insights into immune mechanisms that may be applied to developing a vaccine or cure for HIV. A better understanding of the consequences of control could also inform treatment decisions for virological controllers. To date, few African controllers have been described. We examined the genetic, clinical and immunological characteristics of HIV controllers in a cohort of South African women, characterising two elite controllers in detail.

Methods

We identified virological controllers from the CAPRISA 002 cohort of HIV-1 subtype C infected young women in KwaZulu Natal, South Africa, and classified them according to their plasma viral load levels in the absence of ART. Virological controllers: sustained HIV-RNA measurements between 50 – 2000 copies/ml after six months post-infection

Elite controllers: consecutive undetectable HIV-RNA measurements for six months or more Clinical features, CD4+ count and viral load trends and HLA haplotypes were analysed. T cell activation and HIV-specific T cell responses were determined using flow-cytometry.

Results

The highest viral load (12,902 RNA copies/ml) was detected at 23 days post infection (pi). Virus was LDL/undetectable at 7 months pi and stably suppressed at 10 months pi for more than 6 years. CD4 count, although never below 500 cells/mm3, recovered 14 days pi. Virus was LDL/undetectable at 6 weeks pi, and stably suppressed for more than 6 years. CD4 count, although never below 500 cells/mm3, recovered during viral suppression, as did the CD4/CD8 ratio. PBMC specimens tested at time points pi to 5 years, as indicated with green arrows.

Discussion

In this cohort of HIV-1 subtype C infected South African women, the prevalence of controllers is consistent with published data from larger cohorts elsewhere.(1,2,3) HLA-mediated control Both elite controllers had Class I and Class II HLA alleles that have been associated with viral control. EC-1 mounted a potent Gag TL9 CD8+ response, likely restricted by B*8101. HIV specific responses prior to infection EC-2's HIV-specific responses detected prior to estimated date of infection may suggest infection not detected by standard PCR diagnostic tests, or alternatively, HIV exposure without infection. HIV-specific responses in the absence of infection have been described in PIEP trials and highly-exposed individuals.(6,10,11,12)

Conclusions

While this subtype-C infected African cohort displayed rapid disease progression overall, as compared to subtype-B infected cohorts elsewhere,(6,7) the clinical, genetic and immunological features of the controllers correspond to those of their international counterparts. This suggests that progress in HIV controller science may be directly applicable in certain under-researched populations.

References