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Oral presentation

OA05-03. Efficacy study of a T-cell-based DNA vaccine delivered by intradermal electrotransfer in macaques

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Background

We recently demonstrated that intradermal (ID) injection with electropororation (EP) of a new HIV DNA vaccine induced strong and persistent specific T-cells in macaques. Here, we used an equivalent vaccine encoding SIVmac251 antigens in order to study its efficacy in SIV mucosal challenge of macaques.

Methods

Eighteen macaques were vaccinated with 1 mg of the auxo-GTU-MultiSIV DNA at week 0, 4 and 12: either by the ID route only (n = 6), or by the ID route combined with EP (ID+EP; n = 6) or ID+EP with co-injection of a plasmid used as ''genetic-adjuvant'' (n = 6). A control group of unvaccinated animal was included (n = 6).

Results

Before challenge, all animals raised SIV-specific T-cells as evidenced by IFN-γ ELISPOT (110 ± 42, 921 ± 310 and 905 ± 252 spots/106 cells in the ID only, ID+EP and ID+EP+genetic-adjuvant groups, respectively). Weak and transient antibody responses were detected. All animals were intrarectally challenged with pathogenic SIVmac251. T-cell responses increased in both ID+EP groups as early as week 1 post-challenge (3,898 ± 395 and 3,031 ± 893 spots, respectively), and up to 12,000 spots by week 2. Macaques immunized ID only raised delayed and lower responses remaining earlier and higher than in controls. At peak of viremia, plasma viral load was significantly reduced ($p = 0.0104$) in the ID+EP group. Interestingly, no reduction of plasma viral load was observed by that time in the genetic-adjuvant group despite high anamnestic responses. Differences in anti-Gag responses may explain this observation. Viremia was not reduced in the ID only group. At set-point, although similar plasma viral load in all groups, reduction of SIV-DNA copies in rectal biopsies was observed in the vaccinated animals.

Conclusion

Electroporation results induced high anamnestic T-cells responses which are better associated with the control of early plasma viremia. Impact of vaccine on disease progression is currently under evaluation.