Retrovirology

BioMed Central

Oral presentation

Open Access

OA04-02. Strong HIV-specific CD4 and CD8 T-lymphocyte proliferation in HIV-1 DNA prime/modified vaccinia virus Ankara (MVA) heterologous boost vaccinees

C Nilsson*[1], S Aboud[2], K Karlén[1], M Marovich[3], B Wahren[1], E Sandström[4], H Gaines[1], G Biberfeld[1] and K Godoy-Ramirez[1]

Address: [1]Immunology and Vaccinology, Swedish Institute for Infectious Disease Control, Karolinska Institute, Solna, Sweden, [2]Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania, [3]Walther Reed Army Institute for Research, Rockville, MD, USA and [4]Venhälsan and Karolinska Institutet, Stockholm, Sweden

* Corresponding author

from AIDS Vaccine 2009
Paris, France. 19–22 October 2009

Published: 22 October 2009

Retrovirology 2009, **6**(Suppl 3):O26 doi:10.1186/1742-4690-6-S3-O26

This abstract is available from: http://www.retrovirology.com/content/6/S3/O26

© 2009 Nilsson et al; licensee BioMed Central Ltd.

Background

We determined HIV-1-vaccine-induced lymphoproliferative responses in vaccinees immunized with a multigene, multiclade HIV-1 plasmid DNA vaccine boosted with heterologous HIV-1 recombinant MVA in a phase I HIV safety and immunogenicity study (HIVIS01/02).

Methods

Healthy volunteers were immunized intradermally or intramuscularly (with or without adjuvant GM-CSF protein) with DNA expressing HIV-1 gag, env, rev and rt at months 0, 1 and 3 using a Biojector and were boosted at nine months with an MVA expressing heterologous inserts of HIV-1 *gag*, *env* and *pol* genes. Lymphoproliferative responses to AT-2 inactivated HIV-1 antigen were tested by a 3H-thymidine uptake assay and a flow-cytometric assay of specific cell-mediated immune-response in activated whole blood (FASCIA-WB) two weeks after HIV-1 MVA boost (n = 38). A FASCIA using peripheral blood mononuclear cells (FASCIA-PBMC) was also employed during the later part of the study (n = 14).

Results

Thirty-five of 38 (92%) vaccinees were reactive by the 3H-thymidine-uptake assay (SI > 8). Thirty-two of 38 (84%) vaccinees were reactive by the CD3+CD4+ T-cell FASCIA-WB (% stimulation > 1.2), seven (18%) also exhibited CD8+ (CD3+ CD4-) T-cell responses. Of the 14 vaccinees analyzed using all three assays, ten (71%) and eleven (79%) demonstrated CD4+ T-cell responses in FASCIA-WB and FASCIA-PBMC, respectively. CD8+ T-cell reactivity was observed in 3 of 14 (21%) and 7 of 14 (50%) using the FASCIA-WB and FASCIA-PBMC, respectively. There was strong correlation between the proliferative responses measured by the 3H-thymidine uptake assay and the CD4+ T-cell FASCIA-WB ($r = 0.68$; $p < 0.01$).

Conclusion

HIV-1 specific T-lymphocyte proliferative responses were detected in a high proportion (37/38) of volunteers following HIV-1 DNA/MVA immunization. The FASCIA revealed both CD4+ and CD8+ T-cell proliferation in response to HIV-1 antigen stimulation. A standardized FASCIA-PBMC, which allows simultaneous phenotyping may be an option to the conventional 3H-thymidine uptake assay for assessment of vaccine-induced T-cell proliferation, especially in isotope-restricted settings.