Abstract

Background: Mucosal HIV-specific antibodies may help to prevent acquisition of HIV-1. An efficacious vaccine may require a mucosal immune response. We show that vaccine-induced antibodies can be found in mucosal fluids, albeit at low frequency.

Methods: The Kenya AIDS Vaccine Initiative (KAVI) took part in 3 Ph1 HIV vaccine trials (B002, B003 and B004) at 2 sites in Nairobi. Participants were consented for a mucosal sub-study and asked to provide saliva (SA), oral fluid (OF), semen (SM), cervico-vaginal (CV) and rectal (RC) specimens. Specimens were collected at baseline and 2 post-vaccination time points and IgG and IgA against either HIV-1 Gag (p24; B002 and B004) or Env (gp140; B003 and B004) were measured by ELISA, samples giving a positive reading (by absorbance) were then titrated. IgA and IgG antibodies in serum or plasma (SPL) were also measured at the same time points. Concordance was confirmed between assays at KAVI and the IAVI Human Immunology Laboratory, London.

Results: Of 105 Kenyan participants, 89 consented to the sub-study and provided at least one mucosal sample type. Anti-HIV IgG and/or IgA antibodies tested, to date, were detected in 32/193 (17%) oral fluid/parotid saliva, 13/42 (31%) SM, 12/82 (15%) CV, 8/27 (30%) RC and 68/84 (81%) of SPL samples. In SA, OF, CV and SM samples most antibody responses were IgG, while there were more volunteers with IgA in the RC samples. Some RC samples had low levels of IgA antibody reactivity prior to vaccination. Antibody titers at the mucosal surface ranged from 1:20-1:100 while corresponding serum levels were up to a titer of 1:12500.

Conclusions: It is possible to detect vaccine-induced antibodies against HIV at the mucosal surface. When antibodies are found in the mucosa, they are at much lower titers than those seen in the periphery.