A vaccine that protects against the different HIV subtypes circulating around the world is essential to control and eliminate HIV infection. The immunogens are the key to develop an effective HIV vaccine. In this study, we characterized the antibody response against recombinant C2V3C3 polypeptides from several HIV-1 subtypes and evaluated the neutralizing antibody response. Plasmas from HIV-1 infected individuals under treatment (n=39) and drugs naïve (n=8) were tested in an ELISA assay to determine the presence of antibodies against polypeptides from HIV-1 subtypes (CRF02_AG, B, C, G and H). The neutralizing activity of plasma was evaluated with a panel of six HIV-1 viruses from a reference panel, [one tier 1 (NL4.3), and five tier 2 (PCH119_CRF07, PCE1176_C, TRO11_B, 246F3_AC and CRF07_BJOX2000)] in a TZM-bl cells-based assay. Out of 48 plasmas, 44 (89.6%) reacted at least with one polypeptide and four (10.4%) did not react with any polypeptide. Interestingly, 56% of the plasmas recognize ≥3 peptides and six reacted with all polypeptides. The polypeptide from virus CRF02_AG was the most antigenic (77%) followed by the polypeptide C (58.3%), G (58.3%), H (50%) and B (35.4%). There was a positive correlation between polypeptides number recognized and binding antibody reactivity (r=0.4895, P=0.0111). All plasmas from drugs naïve individuals neutralized at least one virus with neutralizing activity between 39.3% and 95.7%. Four plasmas showed neutralizing activity >50% against five viruses. The virus 249F3 was the easiest to neutralize (median, 65.7%), whereas PCH119_CRF07 was the most difficult to neutralize (median, 43.6%). Neutralizing activity of plasmas from patients under treatment are ongoing.

In summary, these polypeptides could be useful in vaccine design once they are very antigenic and we observed a heterologous neutralizing antibody response in naïve patients that expressed positive antibody response anti-peptides.

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