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Poster presentation

P16-14. Loss of balance between CD4+ regulatory T cell and Th17 population in chronic HIV infection

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Background

Cumulative data indicate that $CD4^+$ Treg and Th17 cells are reciprocally regulated during differentiation and play couter balance role in inflammatory diseases, suggesting the balance of them is critical in maintaining effective immune function. Loss of such an immuno-balance has recently been documented in tumors and SIV infection. However, little data is available on the balance between Treg and Th17 in chronic HIV-1 infection.

Methods

HARRT naive subjects with chronic HIV-1 infection(n = 80)and HIV-1 negative control were enrolled (n = 24). Treg were analyzed in FACSCalibur with fresh PBMC, while Th17 analyzed in PBMC stimulated with PMA/ionomycin followed by BFA block. Treg and Th17 levels were represented as percentages of $CD4^+CD25^{hi}Foxp3^+$ cells and $CD4^+IL\text{-}17A^+$ cells in $CD4^+$ T population respectively, and the ratio of Th17 to Treg was used to evaluate the immuno-balance.

Results

When correlating Treg or Th17 level with $CD4^+$ T cell counts or plasma viral load, only the inverse association between Treg and $CD4^+$ T count was significant ($r = -0.462$, $p < 0.001$). Treg levels with $CD4^+$ T counts/μl below 200 (median = 8.29%, n = 11) was significantly higher than those above 200 (5.00%, n = 69) or HIV-1 negative control (4.34%, n = 24) ($p < 0.001$, < 0.001), while Th17 level in both HIV-1^+ subjects with CD4+ counts/μl below 200 (0.79%) or more than 200 (0.63%) were significantly higher than HIV-1 negative control (0.30%) ($p = 0.011$, < 0.001). Th17/Treg ratio was significantly elevated in HIV-1^+ subjects than HIV-1 negative control (0.1210 v.s. 0.0641, $p = 0.002$). Notably, elite controllers (n = 4) have a comparable Treg, Th17 levels and Th17/Treg ratio with HIV-1 negative control ($p = 0.777$, $= 0.818$, $= 0.922$).

Conclusion

An inproportionally increased peripheral Th17 and Treg levels leading to elevated Th17/Treg ratio was observed in subjects chronically infected with HIV-1, suggesting a loss of immuno-balance in HIV-1 infection. However, the elite controllers manifested a preservation of such an immuno-balance, which may shed new light into understanding of HIV-1 pathogenesis and facilitate vaccine development.