**Background**

- Immune activation and inflammation are associated with HIV progression and death.
- ART reduces morbidity and mortality of HIV but only partially reduces immune activation.
- Women, on average, have lower plasma HIV RNA (VL) early in HIV infection compared to men, but progress to AIDS at the same rate, if not faster, than men.
- Sex-specific differences in immune activation and inflammation pre- and post-ART initiations could explain these observed clinical differences, but these have not been well studied.

**Methods**

We measured immune and inflammation marker activities (IFNy, TNFα, IL5, IL10, IP6, CRP, lipopolysaccharide (LPS), sCD14, EndoCAb IgM, activated CD4+DR+38+ and activated CD6+DR+38+) prior to ART, at week 24 and week 48 post-ART.

**Study sites:**
- Cornell CTSC (NCATS KL2TR004586)
- Additional grant from the US National Institutes of Health (R01 AI45462 to Amita Gupta)

**Results**

**Conclusions & Implications**

1. Before ART, women had a more favorable immune profile than men, including:
   - A higher CD4 count
   - Lower viral load
   - Lower CRP
   - Lower detectable LPS
   - Lower sCD14

2. In the multivariate analysis, women had a greater slope change in CD4 and TNF-α than men, but less of a change in:
   - Log viral load
   - CRP
   - LPS
   - sCD14

3. By week 48, men and women had similar levels of CRP, detectable LPS and sCD14.

4. At week 48, men still had a significantly lower CD4 than women, but also had significantly lower IFNy levels with a trend towards lower TNF-α and IL-10 levels.

5. Increased inflammation/immune activation may result in functional T cell anergy and premature CD4 apoptosis, both of which can lead to HIV progression. These factors should improve with decreased viral loads post-ART.

6. Post-ART increases in markers such as CRP, LPS, and sCD14 in women may reflect an ongoing sex-related inflammatory response and explain why women progress to AIDS with lower viral loads.

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