

## **Levels of Total Antioxidant Capacity, sCD14, and TGF- $\beta$ 2 in Breast Milk Plasma of HIV-Infected and HIV-Uninfected Lactating Women**

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### **Abstract**

**Introduction:** Breast milk provides nourishment for infants and nonnutritive bioactive factors, which possess key protective and developmental benefits essential in shaping the infant immune system. However, the impact of human immunodeficiency virus (HIV) and universal antiretroviral therapy (ART) on breast milk nutritional composition and immunity status is not well documented. **Objective:** The study aimed to compare breast milk immune factors; total antioxidant capacity (TAC), soluble cluster of differentiation 14 (sCD14), and transcription growth factor-beta 2 (TGF- $\beta$ 2) levels between HIV-infected and HIV-uninfected lactating mothers and determine the association between breast milk parameters with HIV disease progression and duration of ART. **Methods:** Breast milk sCD14, TAC, and TGF- $\beta$ 2 were quantified using enzyme-linked immunosorbent assays and spectrophotometric techniques in 57 HIV-infected breast feeding mothers on option B+ therapy for prevention of vertical transmission of HIV and 57 HIV-uninfected mothers at 6 weeks postpartum. The plasma HIV viral load was measured on enrollment and demographic data were recorded. **Results:** Mean breast milk plasma TAC levels were significantly lower in HIV-infected mothers ( $1,250.5 \pm 280.4 \mu\text{molTE/L}$ ) compared to the HIV-uninfected participants ( $1,915.4 \pm 326 \mu\text{molTE/L}$ ;  $p < 0.001$ ). Soluble CD14 levels in HIV-infected mothers were significantly higher ( $7,059.3 \pm 1,604.7 \text{ ng/mL}$ ) compared to the HIV-uninfected group ( $5,670.7 \pm 1,268.3 \text{ pg/mL}$ ;  $p < 0.001$ ). Similarly, TGF- $\beta$ 2 concentration was also significantly elevated in the HIV-infected mothers ( $1,426.1 \pm 695.4 \text{ pg/mL}$ ) compared to the HIV-uninfected counterparts ( $709.2 \pm 196.8 \text{ pg/mL}$ ;  $p < 0.001$ ). A positive correlation was observed between breast milk plasma sCD14 concentration and the plasma viral load ( $r = 0.576$ ,  $p < 0.001$ ), while a significant negative correlation was observed with the duration of ART ( $r = -0.285$ ,  $p = 0.032$ ). TAC and TGF- $\beta$ 2 concentrations were inversely correlated with plasma viral load levels. **Conclusion:** HIV-infected mothers are at risk of oxidative stress. Nutritional intervention with antioxidant rich foods is recommended for this vulnerable group during breastfeeding.