HIV Viral Load and CD4 Cell Count distributions in untreated pregnant women entering care in Cape Town, South Africa (Poster 873)

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Background

- In many parts of sub-Saharan Africa, CD4+ cell counts remain a standard for determining eligibility for triple-drug antiretroviral therapy (ART) regimens in HIV-infected pregnant women
- There is widespread interest in policies for the universal use of ART in pregnancy, regardless of CD4+ count, to reduce viraemia and the subsequent risks of both vertical and horizontal HIV transmission
- However there are few data on (i) the distribution of HIV viral loads in untreated HIV-infected pregnant women before antiretroviral exposure, and (ii) the correlation between viraemia and CD4+ cell counts that may be used to define ART eligibility

Methods

- We measured HIV viral loads (VL) in consecutive HIV-infected pregnant women, not already on ART or antiretroviral prophylaxis, making their first visit to services for the prevention of mother-to-child HIV transmission (PMTCT) at a large urban antenatal clinic in Cape Town, South Africa
- Specimens for VL (Abbott RealTime HIV-1 assay) and CD4+ cell count via flow cytometry (Beckman Coulter) were taken before initiating antiretrovirals, with testing conducted by the National Health Laboratory Services
- Socio-demographic characteristics and medical history were taken from structured interviews and clinical/laboratory record reviews
- Receiver-operating characteristic (ROC) analyses were used to determine the ability of CD4 cell count thresholds to detect viral loads >10,000 (4.0 log) copies/mL

Results

- Between 1 April 2013 and 31 Jan 2014, n=1034 pregnant women presented for their first antenatal visit and entered PMTCT services; of these, n=642 (62%) had no exposure to ART or prophylaxis within past 4 months
- Median age, 28 years; IQR: 24-32; median parity, 1; 19% primaparous
- Median gestation at study visit, 18 weeks (IQR, 12-23 weeks)
- The median plasma VL in all women was 3.96 log copies/mL (IQR, 3.37-4.46); the median CD4 cell count was 390 cells/μL (IQR, 258-562)
- Overall, 43%, 25% and 32% of women had CD4 cell counts of <350, 350-500, and >500 cells/μL, respectively (Figure 1a)
- 309 women (48%) had VL >4.0 log copies/mL
- In these women, 191 (63%), 64 (21%) and 48 (16%) had CD4 cell counts <350, 350-500 and >500 cells/μL, respectively (Figure1b)
- If used to identify women with VL > 4.0 log, a CD4 cell count threshold of <500 cells/μL was 84% sensitive (Figure 2), and would fail to identify 16% of women with raised VL
- The predictive ability of CD4 <350 or <500 in detecting women with VL >4.0 log did not vary across age, gestation or gravidity subgroups

Figure 1a: Plot of CD4 vs VL measures; vertical red lines denote 350 and 500 cells/μL; horizontal red lines denote 1.60 (the lower level of detectability), 3.0, 4.0 and 5.0 log copies/mL

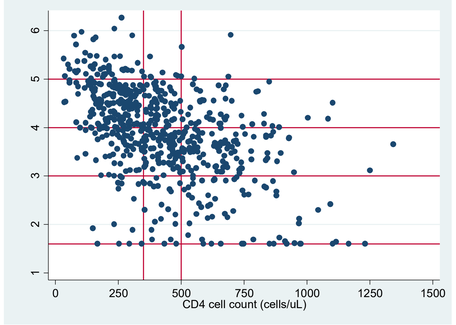
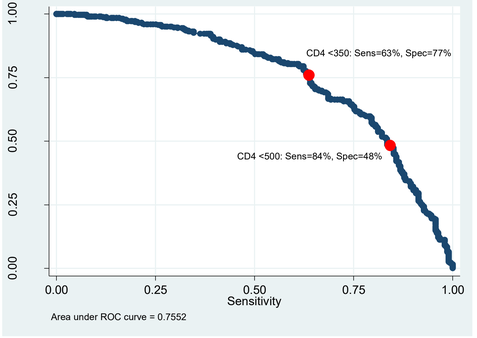


Figure 2: Modified ROC plot of Sensitivity vs Specificity of CD4 count thresholds for identifying women with VL > 10,000 copies/mL



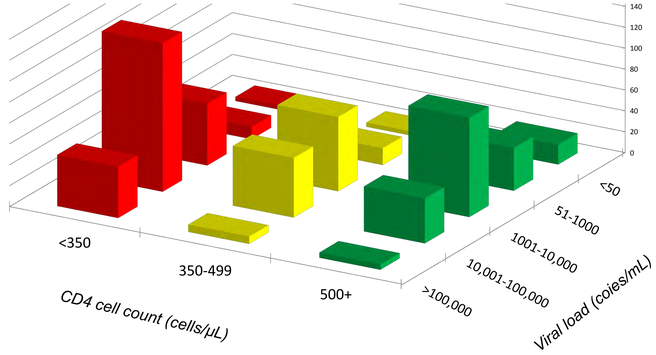


Figure 1b: Categories of plasma VL according to categories of CD4 cell count

Conclusions

- A substantial proportion (18%) of HIV-infected pregnant women who are unexposed to antiretrovirals enter PMTCT programmes with:
  - *relatively high viral loads* (>10,000 copies/mL), representing an appreciable risk of mother-to-child HIV transmission, and
  - *relatively high CD4+ cell counts* (>350 cells/μL) that would make them ineligible for triple-drug antiretroviral regimens under many PMTCT policies
- In the context of increasing attention to 'elimination' of mother-to-child HIV transmission, these data point to potential limitations of strategies that use CD4-based criteria to define ART eligibility for pregnant women

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