



Decreasing HIV Incidence and Prevalence at the Johns Hopkins Emergency Department with a Concurrent Increase of Virally Suppressed HIV-infected Individuals

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Background

- The Johns Hopkins Hospital Emergency Department (JHHED) serves the local socioeconomically disadvantaged minority population of inner city Baltimore
- Approximately 55,000 patient visits per year
- HIV prevalence at the Johns Hopkins Emergency Department was previously reported for 2001 and 2003 (12% and 11%, respectively), along with the observation that viral suppression affects titer-based HIV incidence assays

Methods

JHHED Samples

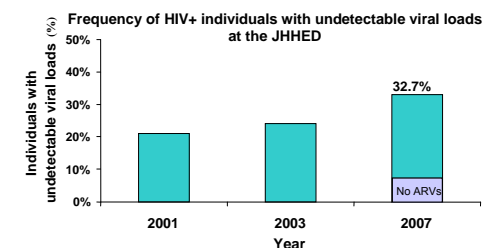
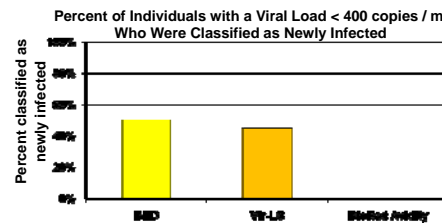
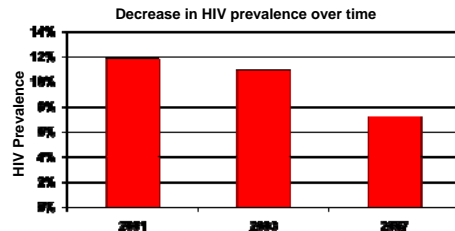
- 4475 subjects (18+ yrs) evaluated over an 8 week period (6/2007 to 9/2007)
- All samples tested for HIV by Bio-Rad HIV-1/HIV-2 Plus O EIA and Bio-Rad HIV-1 Western blot and HSV-2 by Focus HerpeSelect_® IgG₂-specific ELISA.
- All HIV positive samples tested by Roche_® Amplicor v. 1.5 viral load assay
- All HIV+ samples tested for ARVs by HPLC
- Incidence Testing
 - Calypte_® HIV-1 (BED). Determines the proportion of HIV-1 specific IgG
 - Vironostika less-sensitive (Vir-LS) EIA. Measures accumulating antibodies to HIV as they are produced in an aggressive immune response to the virus.
 - BioRad HIV-1/HIV-2 Plus O EIA Avidity. Used to determine the HIV antibody binding strength as the infection progresses

Control Samples

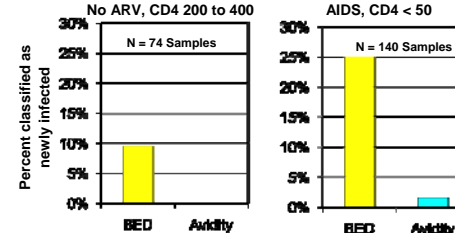
- Samples collected from the Johns Hopkins University Moore Clinic
 - Chronic Infection (CD4 200 to 400, not on ARVs), N = 74
 - Virally suppressed subjects (VL < 50, CD4 > 500), N = 134
 - Advanced AIDS (CD4 < 50), N = 140
 - Elite suppressors (VL <50 not on ARVs) N=16
- All tested for incidence by BioRad Avidity and BED

Acknowledgements

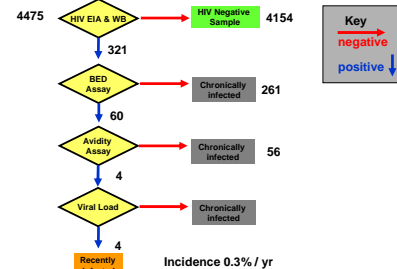
- Control Samples and data were supplied by Jeanie Keruly and Dr. Richard Moore, supported by NIH grant R01-DA11602
- Supported by the Division of Intramural Research, NIAID, NIH and the HPTN (U01-AI-068613).



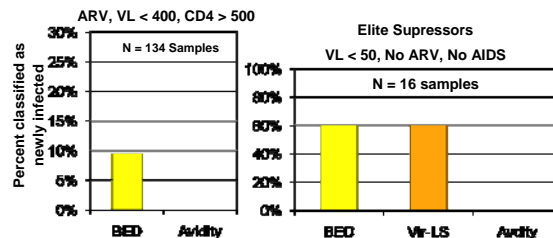
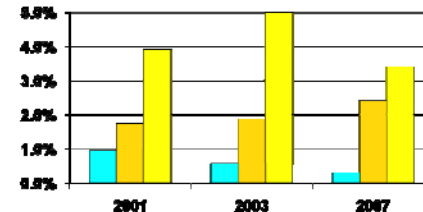
Misclassification of Chronic Controls



Algorithm for HIV Incidence Detection



Uncorrected Incidence Estimates at the JHHED comparing Avidity, Vironostika-LS and BED Assays



The BED assay is affected by low viral loads and dysfunctional immune system by miss classifying chronically infected individuals as newly infected

Summary and Conclusions

- Virally-suppressed individuals are increasing in the JHHED and outnumber recently-infected individuals
- Viral suppression can affect antibody concentration-based HIV incidence assays, such as BED, leading to misclassifying these samples
- Use of these assays for estimating HIV incidence in populations that include virally-suppressed individuals, should be used with caution and confirmed by the Avidity assay and viral load testing
- These data highlight the need for inclusion of additional data (previous test history, ARV use) when calculating HIV incidence using cross-sectional assays that are based on antibody titer
- After a 30 year epidemic in Baltimore, 9% of infected subjects have viral loads < 400 copies / ml with out ARVs
- HIV incidence and prevalence are decreasing for the population of individuals attending the Johns Hopkins Emergency Department