Incident STIs among PLWH in Washington, DC: Measuring HIV transmission risk

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BACKGROUND

- Washington, DC, has a generalized HIV epidemic, with most recent prevalence of 1.9% and approximately one new infection per day.[1]
- Sexual transmission is the most commonly reported mode of becoming infected with HIV in DC.[1]
- The DC Cohort is a city-wide longitudinal cohort of people living with HIV (PLWH) who receive care at 15 centers across Washington, DC.
- The incidence of sexually transmitted infections (STI) in general, including chlamydia, gonorrhea, and syphilis, is rising in the U.S. and in DC.[1,2]
- It is unclear what metrics best convey the risk of HIV transmission. Single-point and longitudinal measures around HIV viral load (VL) >1500 copies/mL have been used to describe increased risk of heterosexual transmission.[3]
- A previous analysis by our group demonstrated that 41.8% of DC Cohort participants had a detectable VL close to the time of STI diagnosis, and 14.6% had VL >1500 copies/mL.[4]

AIMS

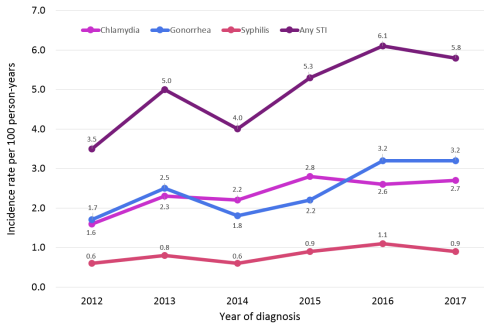
- To describe trends in STI incidence over time.
- To compare longitudinal and single-point estimates of HIV transmission risk in the same cohort.

METHODS

- We analyzed DC Cohort data on participants age ≥18 who received care at one or more of the participating institutions from 1/2011 to 3/2018.
- STI incidence rates were calculated per 100 person-years and stratified by patient demographics.
- Single-point measures of HIV transmission risk were defined as VL >200 copies/mL and VL >1500 copies/mL within one month of STI diagnosis.
- Longitudinal measures of HIV transmission risk were:
  a) Time with VL >200 copies/mL ("Time >200")
  b) Time with VL >1500 copies/mL ("Time >1500")

RESULTS

Figure 1: STI Incidence in the DC Cohort by year, 2012-2017.



CASE DEFINITIONS

A. Gonorrhea
a) Positive nucleic acid amplification test (NAAT) or culture on urogenital or extra-genital (oropharyngeal, rectal) specimen
b) If previously positive, a new positive test done ≥3 weeks later

B. Chlamydia
a) Positive nucleic acid amplification test (NAAT) on urogenital or extra-genital specimen
b) If previously positive, a new positive test done ≥3 weeks later

C. Syphilis
a) Positive non-treponemal test (NTr) titer ≥ 1:8 with a previous non-reactive NTr, or:
b) Four-fold increase in the NTr titer from the previous test, or:
c) Positive treponemal test (Tr) if a NTr titer was ≥ 1:8 and the previous Tr test was negative.

Incident STI cases were counted starting 30 days after enrollment in the DC Cohort. Any combination of chlamydia, gonorrhea, and syphilis diagnosed on the same date in the same participant were considered as a single STI episode.

Figure 2: Subgroups with the highest proportion of HIV VL >1500 copies/mL within one month of STI diagnosis.

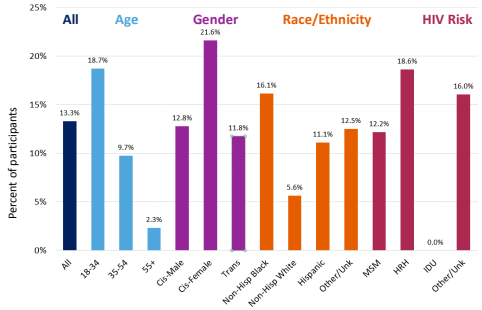
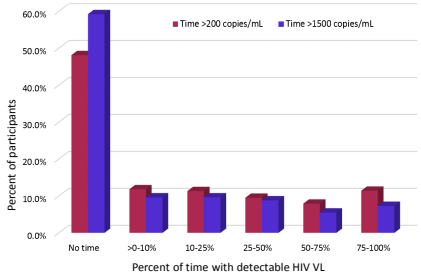


Figure 3: Proportion of time with detectable HIV VL among DC Cohort participants with any incident STI.



KEY FINDINGS

- Among 8,021 participants followed for a median time of 3.4 years, 786 (9.8%) had at least one STI episode; of these, 314 (39.9%) had two or more STI episodes.
- Overall STI incidence rate increased from 3.5 in 2012 to 5.8 in 2017 **(Figure 1)**.
- Among those with any STI, 17.1% had VL >200 and 13.3% had VL >1500 within one month of STI diagnosis **(Figure 2)**.
- Sub-groups with the highest proportion of HIV VL>1500 within one month of STI diagnosis were those aged 18-34, cis-gender women, non-Hispanic Blacks, and people reporting heterosexual HIV acquisition **(Figure 2)**.
- Among participants with incident STIs, 51.9% spent time with VL >200, and 40.8% spent time with VL >1500, within the year of the STI episode **(Figure 3)**.

DISCUSSION

- An increase in STIs over time was observed in the DC Cohort, consistent with national trends.
- Single-point and longitudinal estimates each provide important representations of HIV transmission risk among PLWH with incident STIs.
- Despite evidence for "Undetectable = Untransmittable" and treatment-as-prevention[5], STIs occurring during potential periods of viremia represent events that carry a high risk of HIV transmission.
- In order to achieve the goals of the 90/90/90/50 Plan to End the HIV Epidemic in the District of Columbia, more enhanced and timely prevention, rapid testing, and treatment of partners will be necessary.
- HIV care providers need to communicate with their patients who are not virally suppressed about the risk of transmission if engaging in condomless sex.

STRENGTHS: This analysis combines city-wide data on STI incidence and longitudinal HIV care, capturing sexual transmission risk over time.

LIMITATIONS: This is a clinical EMR-based study, which does not collect detailed information about sexual behaviors (e.g. number and type of partners, type of sexual contact, use of PrEP).

CONCLUSIONS

- Measures of uncontrolled HIV over time provide improved understanding of HIV transmission risks.
- Public health interventions should focus on reducing transmission risk and optimizing HIV outcomes in the groups at highest risk for STIs.

REFERENCES: (1) US DHHS CDC, *STD Surveillance*, 2018. (2) DC DOH HAHSTA, *Annual Surveillance Report*, 2018. (3) Marks G et al., *AIDS*, 2015; 29(8):947-54. (4) Lucar J et al., *Open Forum Infect Dis*, 2018; 5(2):ofy017. (5) Cohen MS et al., *N Engl J Med*, 2016; 375:830-839.

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