Low Rates of HIV Testing among Gonorrhea Infected Individuals with History of Recent Bacterial STIs in Baltimore, Maryland, USA: A Missed Opportunity for PrEP Referral?

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Gonorrhea infected patients are indicated for interventions like PrEP

Individuals with recent history gonorrhea and other bacterial sexually transmitted infections (STIs) are at increased risk of HIV acquisition,[1,2] and individuals with repeat STIs are at even higher risk of HIV. [3,4]

U.S. Centers for Disease Control and Prevention (CDC) recommends that all individuals receiving evaluation for and treatment of gonorrhea be screened for HIV,[5] and that PrEP may be indicated for all individuals infected with gonorrhea.[6]

Individuals with history of a recent bacterial STI (gonorrhea, chlamydia or syphilis) should be evaluated for STIs and HIV concurrently.

[1]Flemming and Wasserheit *STI* 1999, [2] Wasserheit *STD* 1992, [3] Bernstein, et al. *JAIDS* 2010
[4] Tilchin, et al. *submitted,* [5] CDC 2015 STD Treatment Guidelines, [6] CDC 2017 PrEP Clinical Practice Guidelines

Objective

Our goal was to inform local health department HIV prevention strategies by identifying potential gaps in HIV screening among persons diagnosed with gonorrhea who had recent history ($\leq$ 12 months) of any bacterial STI in Baltimore City, Maryland, a U.S. city with a severe HIV epidemic.

Our specific objectives were

- To determine the proportion of gonorrhea infected individuals with recent history of STI, and what proportion were screened for HIV and gonorrhea concurrently; and
- To identify individual and provider characteristics associated with HIV screening at the time of gonorrhea diagnosis

Methods

Data Sources

- Routine public health surveillance data
- Enhanced surveillance data collected through the STD Surveillance Network (SSuN) on reported gonorrhea diagnoses
  - Conducted on a 40% random sample of all gonorrhea diagnoses reported to the Health Department.
  - Inclusion criteria: Baltimore City resident aged $\geq$ 13 years AND the gonorrhea diagnosis > 30 days of any previous gonorrhea diagnosis.
  - Activities include: surveys administered to the diagnosing provider and patient.

Study Population

- Individuals diagnosed with gonorrhea between April 2015 and December 2017 and who were selected for SSuN enhanced surveillance activities who:
  - Had no documented HIV diagnosis at the time of gonorrhea was diagnosed
  - Had documented history of recent ($\leq$ 12 months) of chlamydia, gonorrhea or syphilis diagnosis
  - Completed provider surveys

Methods

Outcome
- HIV screening at the clinical visit when gonorrhea was diagnosed

Individual characteristics were obtained through routine surveillance data:
- Year of Diagnosis
- Patient demographics: Sex at Birth, Race, Age
- Previous STI

Provider characteristics were obtained through SSuN provider surveys:
- Healthcare provider type: PrEP provider (STD clinics/provider participating in “PrEP” demonstration project), ED/Urgent Care/Hospital, Private healthcare provider/Other)
- Healthcare provider same as provider who diagnosed patient’s recent prior chlamydia, syphilis or gonorrhea infection

Statistical Analysis:
- Chi squared tests and log binomial regression used to assess difference in HIV screening across groups
- Multivariate analyses controlled for year, sex at birth, age, provider type and any other variable with $p<0.10$ during bivariate analyses

Results

Between April 2015 – December 2017, the Baltimore City Health Department received reports on 9,607 gonorrhea diagnoses

- 24.2% (n = 2,320) had history of recent chlamydia, gonorrhea or syphilis infection
  - 83.6% (n = 1,939) not known to be HIV infected at time of gonorrhea diagnosis
    - 40.3% (n =782) selected for SSuN, of whom 96.4% (n = 754) eligible for SSuN
      - 66.7% (n = 425) completed provider surveys

Characteristics of gonorrhea infected individuals with recent STI history (n=425)

Individual level characteristics

- 52% diagnosed in 2017 (n = 222), 30.6% (n=130) in 2016 and 17.2% (n = 73) in 2015
- 64% Female (n = 259)
- 83% Black/African American (n = 352)
- 73% Adolescents/Young adults, aged ≤ 24 years (n = 312)
- Prior Infection: 51% (n = 218) gonorrhea, 44% (n=191) chlamydia infection and 3.3% (n = 14) syphilis

Provider level characteristics

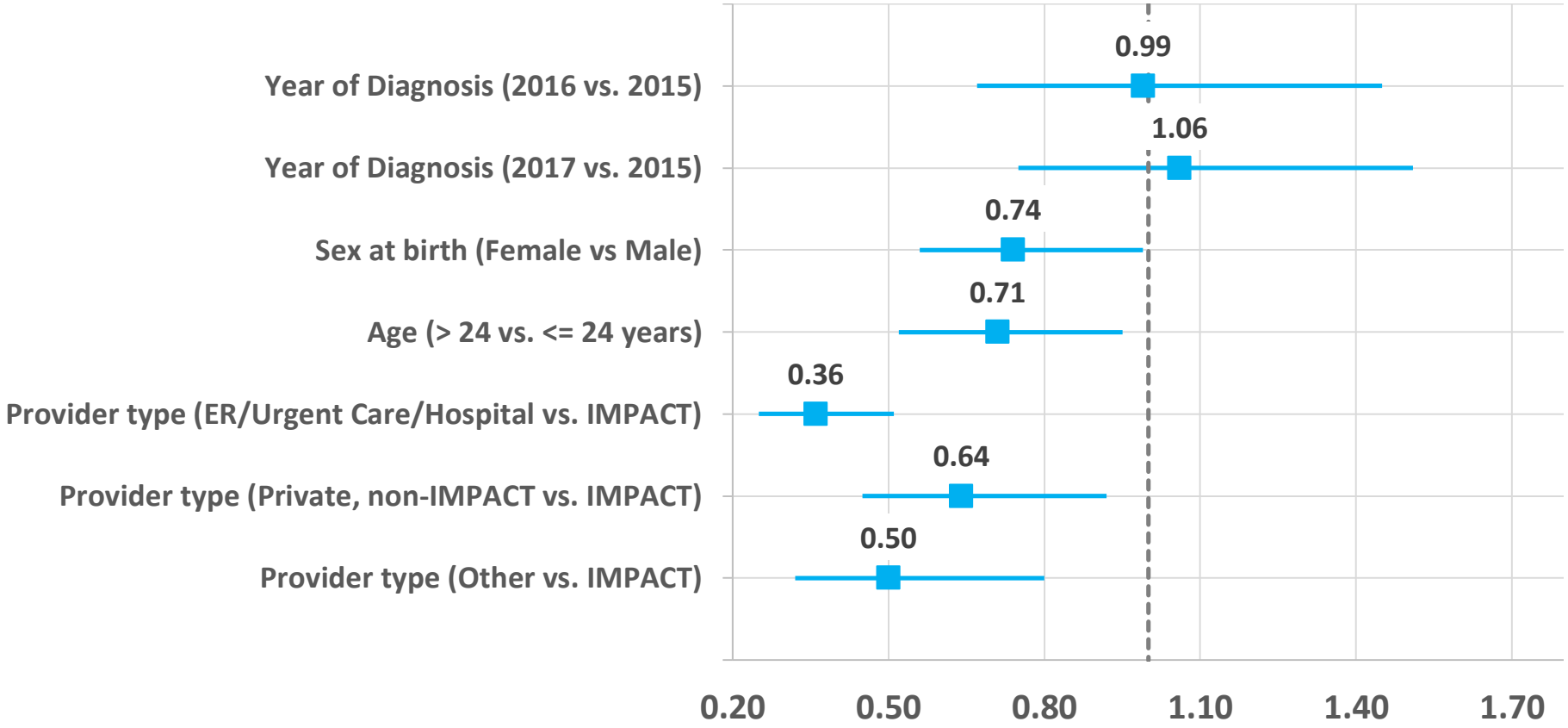
- 24% (n = 100) were diagnosed at an STI clinic or PrEP provider, 41% (n = 176) at ED/urgent care/hospital), 20% (n = 82) by private provider and 15.3% (n = 65) by other provider
- 30% (n = 129) the previous STI and current gonorrhea infection were diagnosed by the same healthcare provider
- 33.6% (n = 142) had received an HIV test at the same visit gonorrhea was diagnosed

Characteristics Associated with HIV Screening

		Total	HIV Screening		Relative Risk	
		N	n	*Row %*	RR	95% CI
	Overall	**425**	**142**	***33.6***		
Year	2015	73	23	*31.5*	Ref	
	2016	139	42	*32.3*	1.03	(0.67 – 1.56)
	2017	222	79	*35.6*	1.11	(0.76 – 1.63)
Sex at Birth	**Male**	**166**	**68**	***41.0***	**Ref**	
	Female	**257**	**74**	***28.8***	**0.70**	**(0.57 - 0.92)***
Age	≤ 24 years	312	106	*34.0*	Ref	
	> 24 years	111	36	*32.4*	0.95	(0.70 – 1.30)
Previous STI Diagnosis	Chlamydia	191	70	*36.6*	Ref	
	Gonorrhea	218	67	*30.7*	0.84	(0.64 – 1.10)
	Syphilis	14	5	*35.7*	0.97	(0.47 – 2.02)
Provider Type	**PrEP provider**	100	59	***59.0***	**Ref**	
	ED, Urgent Care or Hospital	176	37	***21.0***	**0.36**	**(0.26 - 0.50)***
	Private, non-PrEP provider	82	28	***34.1***	**0.58**	**(0.41- 0.81)***
	Other	65	65	***32.6***	**0.50**	**(0.31 - 0.72)***
Provider diagnosed prior STI	No	294	102	*34.7%*	Ref	
	Yes	129	40	*31.0%*	0.89	(0.66-1.21)

* $p < 0.01$

Adjusted Relative Risks of HIV Screening



Summary

About one-quarter of gonorrhea infected individuals had a prior bacterial STI in the past 12 months, among whom, the majority had prior, recent gonorrhea infections. However, only a third were screened for HIV and gonorrhea concurrently.

Sixty percent of individuals diagnosed by PrEP providers were screened for HIV. Forty percent of individuals, however, were diagnosed with gonorrhea in emergency departments, urgent care centers and hospitals, only 21% of whom were screened for HIV. Compared to PrEP providers, those diagnosed in EDs/Urgent Care or Hospitals were 74% likely to be HIV screened.

Current gonorrhea and previous STI diagnosis by the same provider was not associated with HIV screening.

Limitations

Information bias:

- Providers who did not complete the survey may differ in practices than those who did
- Provider surveys likely not be completed by clinician who evaluated or treated the individual

Misclassification:

- HIV screening is assessed at time of gonorrhea diagnosis; some patients may have been screened for HIV when they returned for treatment

Generalizability: High rates of STI history may reflect persistent STI epidemics in Baltimore City, and may not be generalizable to other settings. Similarly, providers in Baltimore City may have have different levels of knowledge and awareness of HIV screening guidelines and these results may not be generalizable to other settings.

Conclusions

Low rates of HIV screening among gonorrhea infected individuals with history of recent STI is alarming; however, it is encouraging that 60% of patients diagnosed in the STI clinics and providers funded for PrEP activities is encouraging.

- This underscores the need for CDC, state and local health departments to continue to promote HIV screening in settings where individuals are evaluated for gonorrhea and other bacterial STIs.

Our results also suggest that outreach to healthcare providers, particularly EDs, urgent care centers and hospital settings regarding HIV prevention guidelines may be warranted.

Given that 70% of gonorrhea infected individuals with recent STI history were diagnosed by different providers, health departments may consider implementing procedures to follow up with these individuals for HIV screening and/or linkage to PrEP providers as part of routine follow-up procedures.

Funding and Acknowledgements

Funding: US Centers for Disease Control and Prevention STD Surveillance Network (PS13-1306)

Acknowledgements:

- Elizabeth Humes
- Sarah Lee
- Delaney Bell
- Taylor Bolton
- Glen Olthoff
- Ravikiran Muvva
- Adena Greenbaum
- Patrick Chaulk