Incident HIV Associated with Rectal Gonorrhea and Chlamydia Independent of Sexual Behavior in Men who have sex with Men

Lindley A. Barbee, Christine M. Khosropour,
Julie C. Dombrowski, Matthew R. Golden

University of Washington
Public Health– Seattle & King County HIV/STD Program

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Public Health
Seattle & King County

BACKGROUND

- Rectal gonorrhea (GC) and chlamydia (CT) are associated with HIV acquisition[1,2]

- STI and HIV share the same causal pathway through sex

- It is unclear if this association is due to biology or behavior

1- Bernstein et al. JAIDS 2010
2- Pathela et al. CID 2013

AIM

- To determine whether the association between concurrent and prior rectal GC and CT infection and HIV diagnosis is independent of receptive anal sexual behavior

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METHODS

- Retrospective case-control study

- Clinical data from Public Health– Seattle & King County STD Clinic, 2001 – 2014

METHODS

- Cases: Persons with new HIV diagnoses who tested HIV-negative ≤12 months
- Controls: Tested HIV-negative & matched 4:1 on year
- Exclusion criteria:
  - Concurrent syphilis infection
  - No rectal GC/CT test at visit
  - Incomplete sexual behavior data

METHODS

- Sexual behavioral data collected as part of clinical care
  - Clinician collected until 2010
  - 2010-14 – CASI collection ~75% persons
  - Questions ask about condom use in aggregate by partner HIV status and anal sex role

		Any Receptive Anal Sex		Condom Use			
		Yes	No	Never	Sometimes	Usually	Always
Partner HIV Status	HIV+						
	HIV-						
	HIV unknown						

METHODS

- Covariate: Sexual Behavior Categories
  - No receptive anal intercourse in 12 months
  - Condoms with ALL receptive anal intercourse (RAI)
  - Condomless RAI ONLY with HIV-negative partners
  - Condomless RAI with HIV-positive/unknown partners

METHODS

- Logistic regression with robust standard errors to estimate odds ratio (OR) for association between rectal GC/CT and HIV
- Step-wise addition of variables
  - Univariate models (3):
    - Current Rectal GC, Current Rectal CT, and History of rectal GC or CT <12 months
  - 1st Multivariable model: Confounders
    - age, race, number of sex partners <2 months, methamphetamine use in prior year, calendar year, other rectal infection (GC or CT respectively, and <12 month)
  - 2nd Multivariable model: Sexual behaviors/Mediating Variables
    - Sexual behavior categories: no RAI, condoms always for RAI, condomless RAI with HIV negative, condomless RAI with HIV-positive/unknown

RESULTS: Study Population
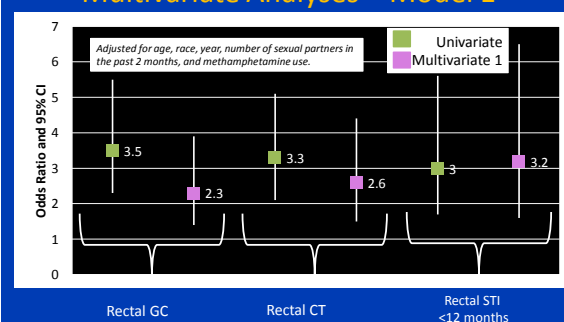
MSM Clinic Visits (2001 – 2014)
N=38,805

RESULTS: Study Population

|	Controls N=704	Cases N=176	P-value
Age (mean, SD)	33.0 (10.2)	31.4 (9.3)	0.061
Race			0.002
White (non-Hispanic)	488 (69.3)	111 (63.1)	
Black (non-Hispanic)	30 (4.3)	15 (8.5)	
Asian	66 (9.4)	5 (2.8)	
Latino/Hispanic	43 (6.1)	14 (8.0)	
Native American/Alaskan Native	5 (0.7)	2 (1.1)	
Unknown/other*	72 (10.2)	29 (16.5)	
Number of sexual partners in <2 months (mean, SD)	3.4 (4.3)	4.7 (5.7)	0.004
Methamphetamine use	96 (13.6)	51 (29.0)	<0.001

Association of HIV diagnosis and Rectal STI among MSM in Seattle STD Clinic: Univariate Analyses
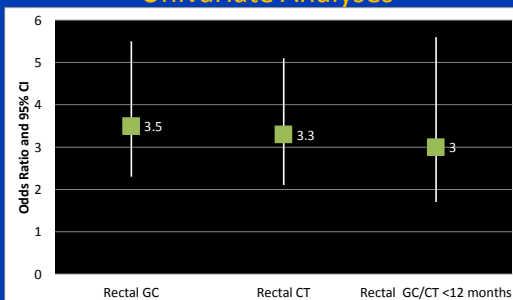
Rectal GC: 3.5; Rectal CT: 3.3; Rectal GC/CT <12 months: 3

Association of HIV diagnosis and Rectal STI among MSM in Seattle STD Clinic: Multivariate Analyses – Model 1

Adjusted for age, race, year, number of sexual partners in the past 2 months, and methamphetamine use.

Univariate / Multivariate 1

Rectal GC: 3.5, 2.3; Rectal CT: 3.3, 2.6; Rectal STI <12 months: 3, 3.2

Association of HIV diagnosis and Rectal STI among MSM in Seattle STD Clinic: Multivariate Analyses – Model 2
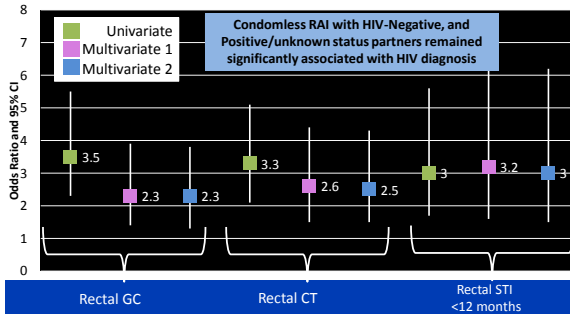
SUMMARY

- Concurrent rectal GC and CT confer a 2-3 fold increase risk of new HIV diagnosis, even after controlling for behavioral risk factors and other covariates

- Prior rectal GC/CT infection in the past year increases the risk of HIV by 3-fold

LIMITATIONS

- Retrospective data
- Subject to recall and social desirability bias
- Residual confounding possible
- Generalizability unknown

CONCLUSIONS

- Rectal gonorrhea and chlamydia are independent risk factors for HIV.
  - This finding is consistent with GC and CT playing a causal role through a biological mechanism

- Findings support STI prevention and control as an HIV prevention intervention

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Contact Info: Lindley Barbee lbarbee@u.washington.edu
Matthew Golden golden@u.washington.edu