



Uncontrolled HIV Infection is a Risk Factor for the Acquisition of other Sexually-Transmitted Infections in Adolescents and Young Adults

Pamela S. Brownstein, MD¹, Scott E. Gillespie, MS¹, Traci Leong, PhD², Rana Chakraborty, MD, PhD^{1,3}, Allison R. Eckard, MD^{1,3}, Andres F. Camacho-Gonzalez, MD, MSc^{1,3}
¹Department of Pediatrics, Emory University School of Medicine and Children's Healthcare of Atlanta; ²Department of Biostatistics and Bioinformatics, Rollins School of Public Health, Emory University; ³Pediatric Infectious Diseases, Emory University School of Medicine and Children's Healthcare of Atlanta



ABSTRACT

Background: Half of the 19 million new sexually-transmitted infections (STIs) and 26% of all new HIV infections each year in the United States occur in youth 13-24 years of age. Co-STIs are a risk factor for HIV acquisition and transmission, but there is a lack of data to assess treatment and virologic control of HIV as an intervention for reducing STI transmission.

Methods: This was a single-centered, retrospective analysis of HIV-infected sexually-active adolescents and young adults from January 2009 to December 2011, designed to compare incidence of STIs among patients with controlled and uncontrolled HIV and identify associated risk factors. Controlled HIV infection was defined as a 3-year mean HIV-RNA viral load of <500 copies/mL and CD4⁺ T-cell count >200 cells/mm³. Socio-demographic, sexual history, substance abuse and HIV variables were evaluated.

Results: Of the 206 enrolled subjects, 59% were male and 92% were African American with a mean age of 21 years (2.1 SD). 64% were horizontally-infected and 19% met the definition of controlled HIV. 44% were men having sex with men with a mean age at first sexual encounter of 15.2 years (2.6 SD). 43% reported having >5 lifetime sexual partners, 69% reported using condoms, 23% had a history of sexual abuse and 58% admitted drug use. 66% contracted an STI during the study period and subjects with uncontrolled disease had a significantly higher STI contraction rate (p=0.006), number of STIs (p=0.01), number of sexual partners (p=0.008), and were more likely to be horizontally-infected (p=0.001). Use of antiretroviral therapy was higher among patients who had no STIs compared to those with ≥1 (p=0.04). In an ordinal logistic regression model adjusting for controlled and uncontrolled HIV status, having ≥1 STI was associated with older age (p=0.04), having >5 sexual partners (6-10 partners p=0.01; >10 partners p<0.001), and non-use of a barrier contraceptive method (p=0.028). Subjects with uncontrolled HIV infection had 2.6 times (95% CI: 1.11, 6.56) the odds of having ≥1 STIs compared to subjects with controlled HIV.

Conclusions: Uncontrolled HIV in adolescents and young adults appears to increase the incidence of co-STIs. Interventions aimed at improving HIV treatment compliance are urgently needed in this population.

BACKGROUND

- Approximately 37,350 people ages 13-24 live with HIV in the United States.
- People aged 15-24 years make up 50% of all those with STIs in the United States.
- HIV-infected adolescents and young adults are engaging in high risk sexual behaviors that lead to co-STIs.
- STIs enhance HIV transmission, alter its natural course and make it more difficult to treat.
- There is a lack of data examining the management of HIV as an intervention for reducing STI transmission.

OBJECTIVES

- Determine the overall incidence of STIs among HIV-infected adolescents and young adults at the Ponce Family and Youth Clinic.
- Compare rates of co-STIs among HIV-infected adolescents and young adults with good virologic and immunological control to those with poor control.

METHODS

- Retrospective chart review
- Study site: Ponce Family and Youth Clinic in Atlanta, GA
- Time period: January 2009 to December 2011
- Inclusion criteria: HIV-infected, sexually active, ages 13-24 years
- Definition of controlled disease: viral load <500 copies/mL and CD4 count >200 cells/mm³
- Definition of an STI: consistent physical examination and/or laboratory findings

Corresponding Author: Andres Camacho-Gonzalez, MD, MSc
2015 Uppergate Drive, Suite 500, Atlanta, GA 30322
P: 404-727-5642 F: 404-727-9223

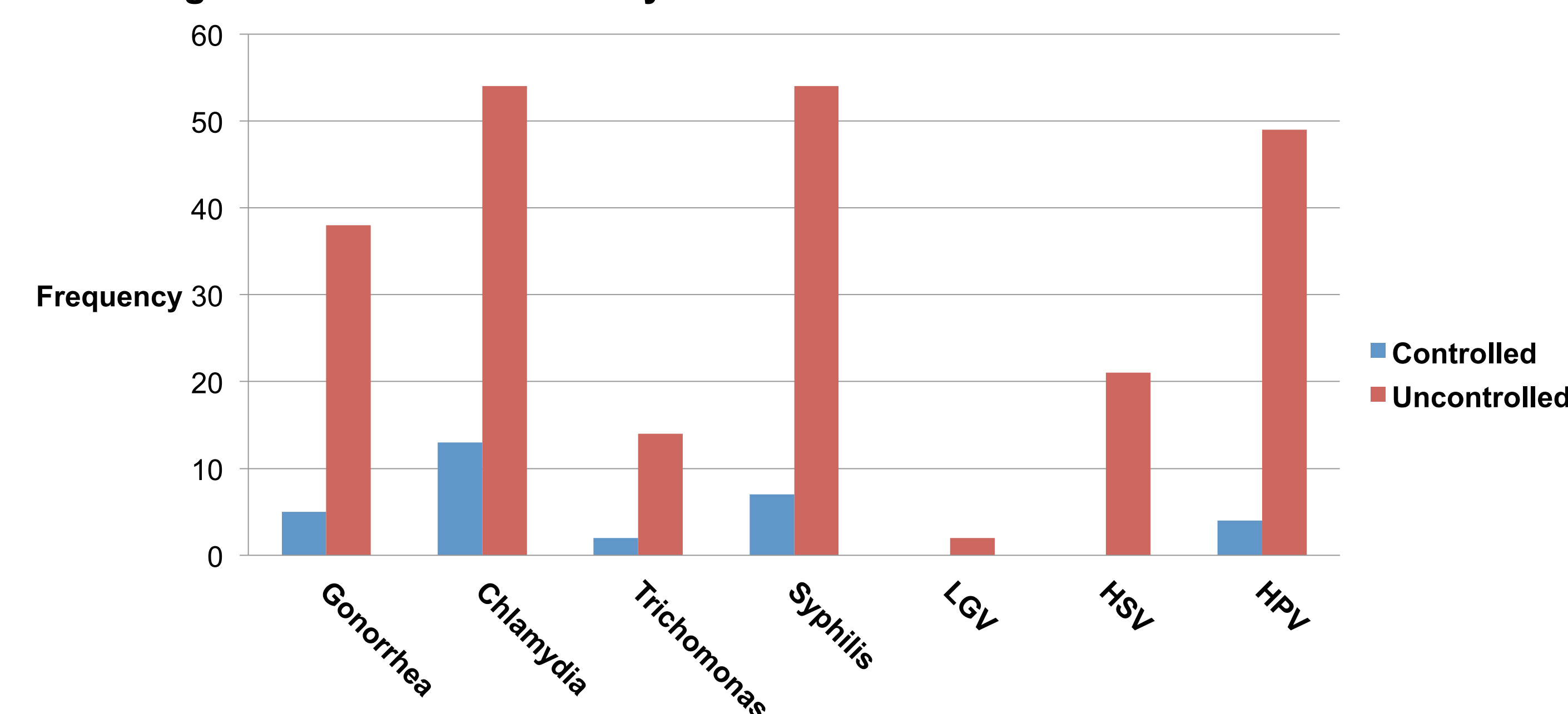
RESULTS

- 206 patients
- 122 (59%) male
- 192 (92%) African American
- 110 (53%) heterosexual
- Mean age 21 ± 2.1 years
- 137 patients (66%) contracted an STI
- Most patients (82%) had uncontrolled HIV

Table 1: Patient Characteristics

Variable	Level	N (%) N=206
Gender	Male	122 (59.0)
	Female	84 (41.0)
Age in years (mean ± SD)		21.0 ± 2.1
Race	African American	192 (92.4)
	Non-African American	14 (9.5)
Mode of HIV Transmission	Vertical	67 (32.9)
	Horizontal	133 (64.3)
Controlled HIV Disease	Yes	38 (19.0)
	No	168 (81.0)
Sexual Preference	Homosexual	68 (33.3)
	Heterosexual	110 (53.3)
	Bisexual	26 (13.3)
Number of Lifetime Sexual Partners	0-5	91 (44.3)
	6-10	33 (16.7)
	>10	53 (26.2)
Barrier Contraceptive Use	Yes	143 (69.0)
	No	45 (22.4)
Contracted an STI	Yes	137 (66.2)
	No	69 (33.8)
Number of STIs	0	69 (33.8)
	1-2	109 (52.9)
	>2	28 (14.3)

Figure 1: STIs Contracted by Controlled vs. Uncontrolled Disease Status



- Univariate analysis for controlled vs. uncontrolled disease
- No significant difference for basic demographic variables
- Differed in mean CD4 count (p<0.001) and mean viral load (p<0.001)
- No significant difference in barrier contraceptive use or sexual preference
- Patients with uncontrolled disease had a significantly higher number of partners (p=0.008), STI contraction rate (p=0.006), and number of STIs (p=0.014)

Table 2: Univariate analysis of controlled vs. uncontrolled HIV

Variable	Level	Patients with Uncontrolled HIV N=168 N (%)	Patients with Controlled HIV N=38 N (%)	p-value
Gender	Male	102 (60.7)	20 (52.6)	0.360
	Female	66 (39.3)	18 (47.4)	
Age (mean ± SD)		21.0 ± 2.1	20.7 ± 2.3	0.438
Race	African American	158 (94.1)	34 (89.5)	0.735
	Non-African American	10 (5.9)	4 (10.5)	
Mode of HIV Transmission	Vertical	46 (28.2)	21 (56.8)	0.001
	Horizontal	117 (71.8)	16 (43.2)	
CD4 Count (mean ± SD)		328.6 ± 186.7	569.9 ± 184.1	<0.001
Viral Load (median, 25%-75%)		11913.5 (5088.5-36350)	0 (0-20.0)	<0.001
Sexual Preference	Homosexual	61 (36.8)	7 (18.4)	0.085
	Heterosexual	84 (50.6)	26 (68.4)	
	Bisexual	21 (12.7)	5 (13.2)	
Number of Partners	0-5	67 (46.5)	24 (72.7)	0.008
	6-10	27 (18.8)	6 (18.2)	
	>10	50 (34.7)	3 (9.1)	
Barrier Contraceptive Use	Yes	117 (75.5)	26 (78.8)	0.686
	No	38 (24.5)	7 (21.2)	
STI Contraction	Yes	119 (70.8)	18 (47.4)	0.006
Number of STIs	No	49 (29.2)	20 (52.6)	0.014
	0	49 (29.2)	20 (52.6)	
	1-2	93 (55.4)	16 (42.1)	
	>2	26 (15.5)	2 (5.3)	

Table 3: Multivariable model assessing the odds of contracting an STI

Parameter	OR (95% CI)
Uncontrolled Disease vs. Controlled Disease	2.698 (1.108-6.567)
>10 Sexual Partners vs. 0-5 Sexual Partners	5.082 (2.193-11.774)
No Barrier Contraceptive Use vs. Barrier Contraceptive Use	2.283 (1.094-4.765)
Every increase in age by 1 year	1.181 (1.001-1.394)

CONCLUSIONS

- HIV infected youth in Atlanta had a high incidence of STIs compared to national average.
- Uncontrolled HIV appears to be a risk factor for the acquisition of STIs.
- Improving linkage to and retention in HIV care may help decrease the spread of STIs in the overall community.