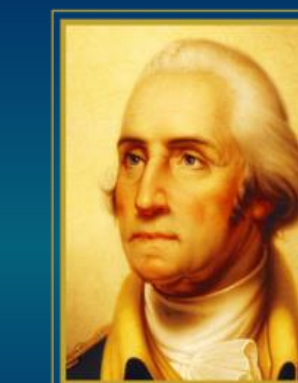




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Sexually Transmitted Infections Among HIV Infected Patients Receiving Care in the District of Columbia: Incidence and Correlates of Syphilis, Gonorrhea, Chlamydia and Viral Hepatitis in the DC Cohort

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1. Introduction

3. Case Definitions

4. Results

- The District of Columbia (DC) has one of the highest HIV infection rates among metropolitan areas in the US, about 2.5% of the adult and adolescent population.
- The occurrence of STIs and viral hepatitis among HIV infected patients has implications for the health of the individual and the community and is a marker of behaviors associated with HIV transmission.
- We aim to examine the frequency and factors associated with the development of syphilis, gonorrhea, chlamydia, and Hepatitis B/C infections among people living with HIV and receiving care in Washington, DC.

- a. Gonorrhea**
- Incident case
 - Positive nucleic acid amplification test (NAAT) or culture on urogenital or extra-genital specimens
 - If a test is positive >=3 weeks after previous positive = new case
- b. Chlamydia**
- Incident case
 - Positive nucleic acid amplification test (NAAT) on urogenital or extra-genital specimens
 - If a test is positive >=3 weeks after previous positive = new case
- c. Hepatitis B infection**
- Hepatitis B infection prior to enrollment (<= 365 days after consent):
 - Positive HBV surface antigen (HBsAg), OR
 - Positive HBV core antibody (IgM or IgG or total), OR
 - Positive HBV DNA, OR
 - Positive hepatitis B "e" antigen (HBeAg), OR
 - Related ICD-9 code
 - New evidence of infection after enrollment that does not fit criteria for incident case (no previous HBsAg, >365 days after consent):
 - Positive HBsAg OR
 - Positive HBV core antibody (IgM or IgG or total) OR
 - Positive HBV DNA OR
 - Positive HBeAg
 - Incident case (>365 days after consent): a previous negative HBsAg AND
 - Positive HBsAg, OR
 - Positive HBV core antibody (IgM or IgG or total), OR
 - Positive HBV DNA, OR
 - Positive HBeAg
- d. Hepatitis C infection**
- Hepatitis C infection prior to enrollment (<= 365 days after consent):
 - Positive HCV antibody (HCV Ab), OR
 - Positive HCV RNA, OR
 - Related ICD-9 CODE
 - New evidence of infection after enrollment that does not fit criteria for incident case (no previous HCV Ab, >365 days after consent)
 - Positive HCV Ab, OR
 - Positive HCV RNA
 - Incident case: a previous negative HCV Ab AND
 - Positive HCV Ab, OR
 - Positive HCV RNA
- e. Syphilis**
- Infection prior to enrollment (including <= 30 days after consent)
 - Positive treponemal (Tr) test, OR
 - Non-treponemal (NTR) test of >=1:8, OR
 - Related ICD-9 code
 - New evidence of infection after enrollment that does not fit criteria for incident case (>30 days after consent)
 - Positive Tr test
 - NTR test
 - Related ICD-9 code
 - Incident case (>30 days after enrollment)
 - Positive NTR test (if >=1:8 or confirmed by a Tr test obtained within 90 days) with a previous negative NTR test, OR
 - Four-fold increase in NTR test, OR
 - Positive Tr test if previous Tr test was negative

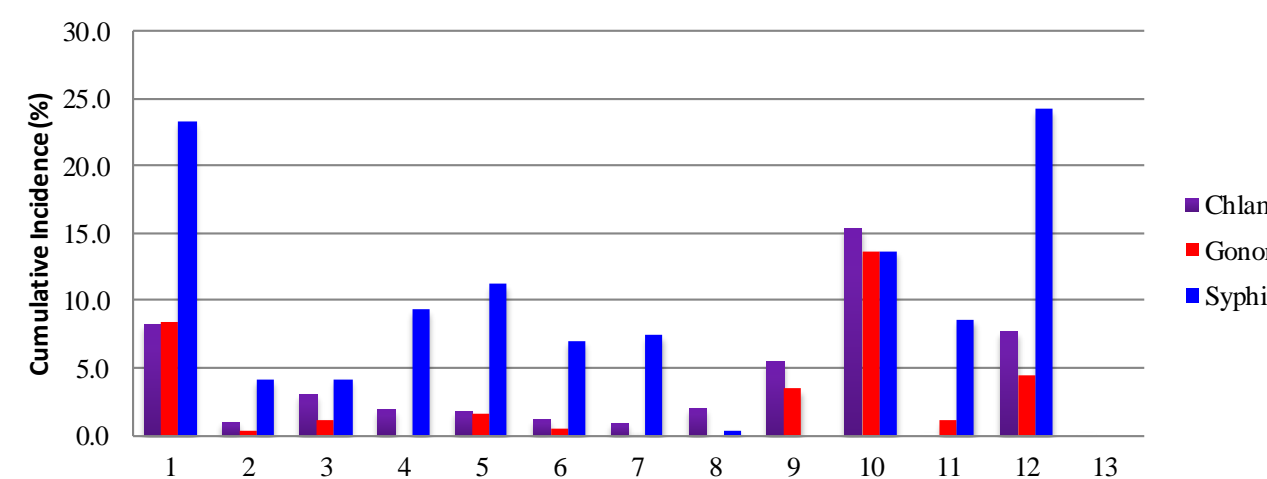
DC Cohort participants consented by March 31, 2015

Median follow-up of 32.8 months

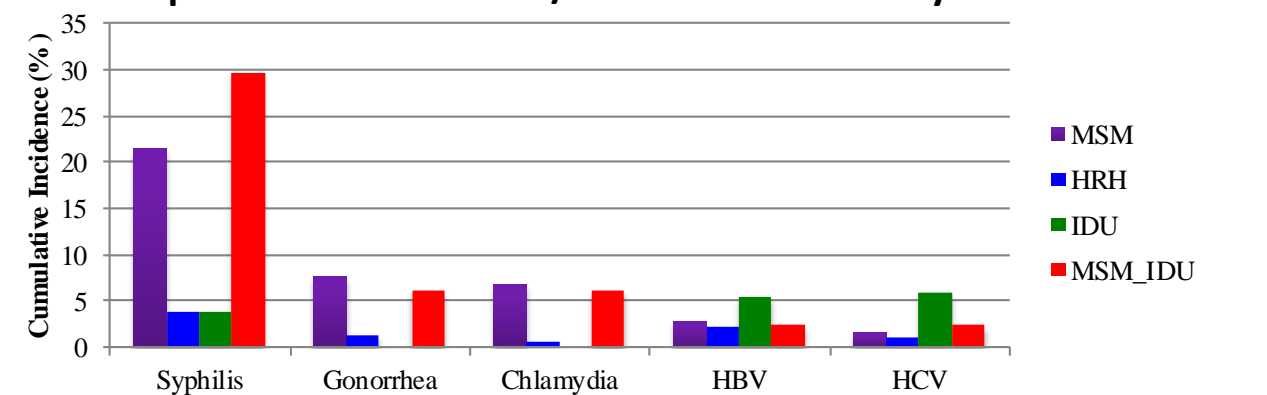
	Total		Chlamydia		Gonorrhea		Hepatitis B				Hepatitis C				Syphilis							
	N	Column %	Incident Infection		Incident Infection		New Infection (but not an incident case)		Infected Prior to Consent		New Infection (but not an incident case)		Incident Infection		Infected Prior to Consent		Infected Prior to Consent		New Infection (but not an incident case)		Incident Infection	
			n	Column %	n	Column %	n	Column %	n	Column %	n	Column %	n	Column %	n	Column %	n	Column %	n	Column %	n	Column %
6931		250	3.6%	212	3.1%	165	2.4%	398	5.7%	94	1.4%	14	0.2%	814	11.7%	381	5.1%	552	8.0%	230	3.3%	
Age at consent (years)																						
18-34	1404	20.3	137	54.8	114	53.8	15	9.1	40	10.1	9	9.6	5	35.7	37	4.5	141	37.0	181	32.8	76	33.0
35-54	3720	53.7	95	38.0	80	37.7	87	52.7	251	63.1	54	57.4	9	64.3	344	42.3	204	53.5	302	54.7	131	57.0
55+	1657	23.9	8	3.2	11	5.2	63	38.2	105	26.4	31	33.0	0	0.0	432	53.1	35	9.2	69	12.5	22	9.6
Unknown	150	2.2	10	4.0	7	3.3	0	0.0	2	0.5	0	0.0	0	0.0	1	0.1	1	0.3	0	0.0	1	0.4
Age at consent, median (IQR)	47.2 (36.6, 54.6)		32.8 (25.6, 42.3)		32.1 (26.0, 42.9)		51.0 (44.1, 58.1)		49.0 (40.4, 55.5)		52.2 (44.7, 57.1)		40.9 (31.2, 45.4)		55.5 (49.9, 59.7)		39.5 (30.1, 48.1)		42.3 (31.9, 50.5)		41.0 (31.6, 48.1)	
Gender at consent																						
Male	4919	71.0	210	84.0	187	88.2	146	88.5	338	84.9	76	80.9	12	85.7	610	74.9	340	89.2	501	90.8	210	91.3
Female	1893	27.3	29	11.6	15	7.1	16	9.7	56	14.1	17	18.1	2	14.3	191	23.5	22	5.8	26	4.7	8	3.5
M-to-F	113	1.6	11	4.4	10	4.7	3	1.8	3	0.8	1	1.1	0	0.0	13	1.6	16	4.2	21	3.8	12	5.2
F-to-M	6	0.1	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0	0	0.0	0	0.0	3	0.8	4	0.7	0	0.0
Race/ethnicity																						
Non-Hispanic Black	5319	76.7	169	67.6	132	62.3	142	86.1	315	79.1	69	73.4	11	78.6	699	85.9	301	79.0	426	77.2	146	63.5
Non-Hispanic White	944	13.6	54	21.6	52	24.5	11	6.7	46	11.6	20	21.3	1	7.1	76	9.3	46	12.1	77	13.9	55	23.9
Hispanic	320	4.6	21	8.4	23	10.9	5	3.0	15	3.8	3	3.2	0	0.0	18	2.2	20	5.2	35	6.3	17	7.4
Other	137	2.0	3	1.2	4	1.9	1	0.6	10	2.5	0	0.0	0	0.0	7	0.9	5	1.3	6	1.1	2	0.9
Unknown	211	3.0	3	1.2	1	0.5	6	3.6	12	3.0	2	2.1	2	14.3	14	1.7	9	2.4	8	1.4	10	4.3
HIV risk behavior																						
MSM	2595	37.4	191	76.4	176	83.0	71	43.0	167	42.0	33	35.1	8	57.1	144	17.7	279	73.2	365	66.1	190	82.6
HRH	2080	30.0	23	9.2	11	5.2	44	26.7	102	25.6	18	19.1	5	35.7	197	24.2	38	10.0	66	12.0	12	5.2
IDU	465	6.7	1	0.4	1	0.5	24	14.5	34	8.5	27	28.7	0	0.0	266	32.7	5	1.3	16	2.9	2	0.9
MSM_IDU	81	1.2	5	2.0	5	2.4	2	1.2	1	0.3	2	2.1	0	0.0	25	3.1	6	1.6	19	3.4	5	2.2
Other/Unknown	1710	24.7	30	12.0	19	9.0	24	14.5	94	23.6	14	14.9	1	7.1	182	22.4	53	13.9	86	15.6	21	9.1

^{**} All p-values are <0.001 for chlamydia and gonorrhea; <0.05 for Hepatitis B; <0.05 for Hepatitis C except for gender and race; <0.001 for syphilis except for race in cases prior to consent.
[^] All p-value calculations tested for differences between patients with incident/new infections after consent and patients with no incident/new infections after consent (except for Hepatitis B/C: restricted to patients without infection prior to consent).
[#] p-values are derived from chi-square and Fisher exact tests for categorical variables and Kruskal-Wallis rank sum tests for continuous variables. Categories of other/unknown values are excluded from p-value calculations.

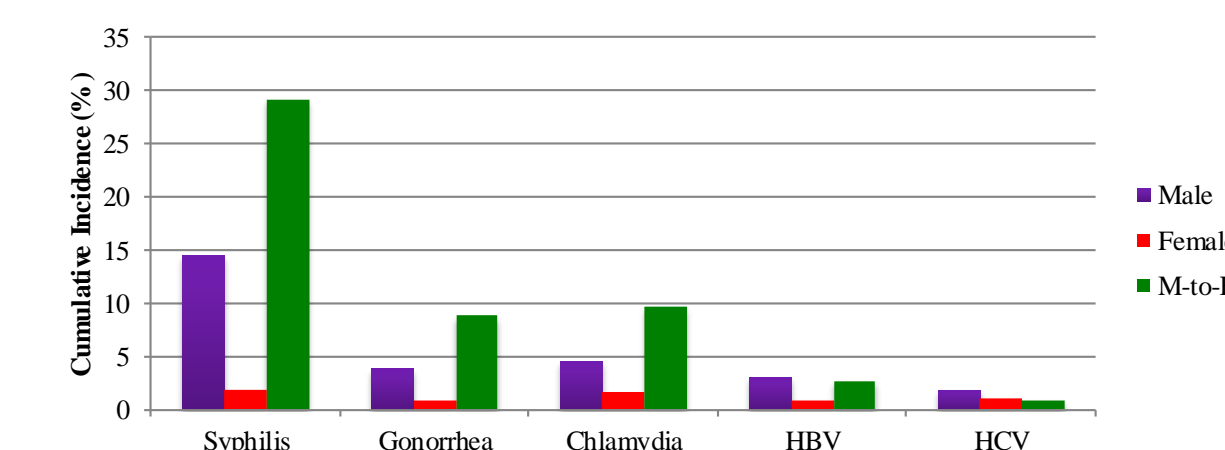
Graph 1: Variability in cumulative new/incident STIs per study site



Graph 2: Cumulative new/incident infections by HIV risk behavior



Graph 3: Cumulative new/incident infections by gender at consent



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5. Conclusions

- Incident STIs and viral hepatitis remain a significant cause of morbidity and reflect ongoing HIV transmission risk among HIV-infected individuals receiving care in Washington, DC.
- STI risk was associated with age, gender, and HIV risk behavior and varied significantly across sites of care.
- These findings allow for further targeting of ongoing public health interventions to reduce STIs and HIV transmission in highest risk populations.
- Further statistical analysis will provide insights into which variables are independent risk factors for STIs and viral hepatitis in the DC Cohort.

***** Abbreviations:** HIV (Human Immunodeficiency Virus), STI (sexually transmitted infection), M-to-F (male to female transgender), F-to-M (female to male transgender), MSM (men who have sex with men), HRH (high risk heterosexual), IDU (injection drug use), HBV (Hepatitis B infection), HCV (Hepatitis C infection)