Prevalence & Factors of HCV Infection Among HIV-Negative & HIV-Positive MSM

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Background

- Gay, bisexual, and other men who have sex with men (MSM), especially those with HIV infection, are at a disproportionately higher risk for acquiring the hepatitis C virus (HCV) when compared to the general population.
- HCV is being detected increasingly in non-intravenous drug users where sexual exposure is the only risk factor (Yaphe et al. 2012).
- **We sought to identify factors associated with prevalent (past/current) and incident HCV infection within a prospective cohort of MSM in Metro Vancouver, Canada.**

Methods

Study Population & Data Collection:
Data were drawn from the Momentum Health Study, a prospective bio-behavioural cohort of MSM who were recruited using respondent-driven sampling between February 2012 and February 2015. Study visits occurred every six months and consisted of:

- A computer-assisted self-interview on: demographics, sexual behavior, and substance use behaviors
- A nurse-administered clinical questionnaire with biological specimen collection for: 1) HCV antibody serology, 2) Syphilis antibody serology, 3) HIV-1 antigen, RNA, and antibody serology, and 4) optional chlamydia and gonorrhea tests

Outcomes:
Participants reporting a history of HCV and unsuccessful clearance at baseline were considered prevalent cases. Seroconvertors were participants who tested negative for HCV-antibodies at baseline, but positive at a subsequent study visit or another testing source between visits.

Explanatory Variables:
Behavioral data are drawn from their most recently completed questionnaire prior to HCV diagnosis, or their last completed questionnaire for participants who remained HCV-negative. Explanatory factors include demographics, sexual behaviour, substance use, as well as HCV testing, diagnosis and treatment history.

Data Analysis:
We used logistic regression and generalized estimating equations to identify factors associated with prevalent HCV antibodies and incident HCV infection at follow-up, respectively.

Results

Prevalent HCV Infection – see Table 1:

- Of 774 participants, 2.0% (15/551) of HIV-negative and 28.3% (50/223) of HIV-positive MSM were HCV-antibody positive at enrollment. Of these, 56/65 (86.2%) were aware of their diagnosis, but only 5 HIV-negative and 17 HIV-positive MSM reported prior HCV treatment, with only 2/7 reporting treatment success.
- **Figure 1** is a mosaic plot of the HIV and HCV relationship among MSM at baseline.

Incident HCV Infection – see Table 2:

- Of 534 participants with follow-up data, we observed 5 HCV-seroconversions for a calculated incidence rate of 0.50 per 100 person-years (95% CI: 0.21-1.21).
- None of this incident infections were previously treated for HCV (no re-infection).
- Only 1 of 5 with HCV seroincidence reported recent injection drug use, and as such was not associated with HCV seroincidence (p=0.32).

Table 2 – Descriptive Statistics and Associations with Incident HCV Infection among all MSM in Vancouver, BC

	Incident HCV (n=5)		
	n	%	OR (95% CI)
Gay sexual identity (vs. not)	5	100	--
HIV-positive (vs. HIV-negative)	5	100	--
Sex work in P6M (vs. none)	0	0	--
Prior HCV Treatment (vs. no)	0	0	--
Current regular partner (vs. no)	0	0	--
Group sex event, P6M (vs. no)	2	40	2.90 (0.49, 17.29)
Any crystal meth, P6M (vs. no)	3	60	**10.62 (1.77, 63.64)**
Any IDU, P6M (vs. no)	1	20	3.01 (0.35, 26.15)
	Median (Q1,Q3)		**OR (95% CI)**
Age in years	48 (45, 56)		1.06 (1.01, 1.12)
# male anal sex partners, P6M	10 (1, 60)		1.01 (1.01, 1.02)

Table 1 – Descriptive Statistics and Associations with Prevalent HCV for MSM in Vancouver, BC

	Prevalent HCV Infections					
	HIV-negative (n=15)			HIV-positive (n=50)		
	n	RDS % (95% CI)	OR (95% CI)	n	RDS % (95% CI)	OR (95% CI)
Non-gay sexual identity (vs. gay)	7	64.8 (25.4, 100.0)	**9.06 (2.69, 30.49)**	13	25.5 (9.1, 41.9)	2.03 (0.9, 4.6)
Live outside downtown (vs. downtown)	3	9.7 (0.0, 24.9)	0.18 (0.03, 1.22)	6	5.8 (0.0, 11.8)	**0.17 (0.05, 0.61)**
Annual income >$30,000 CAD (vs. < $30,000)	6	22 (0.0, 49.4)	0.58 (0.15, 2.34)	6	7.9 (0.0, 17.7)	**0.21 (0.07, 0.64)**
Aboriginal race/ethnicity (vs. White)	4	53.9 (6.5, 100.0)	**16.17 (4.86, 53.84)**	11	34.3 (12.6, 56.0)	**4.60 (1.93, 10.99)**
Escort/sex work in P6M (vs. none)	5	54.6 (7.8, 100.0)	**16.49 (4.78, 56.84)**	9	18.5 (0.8, 36.1)	**11.64 (2.84, 47.73)**
Anal sex position: receptive (vs. insertive)	0	--	--	19	50.1 (29.2, 70.9)	2.37 (0.96, 5.84)
Anal sex position: versatile (vs. insertive)	6	18.8 (0.0, 42.2)	0.43 (0.10, 1.94)	18	27.8 (11.7, 43.8)	1.50 (0.56, 3.99)
Group sex event participation in P6M (vs. none)	2	15.0 (0.0, 39.9)	0.66 (0.13,3.30)	16	33.8 (12.3, 55.2)	1.58 (0.77, 3.24)
Any CAS in P6M (vs. no)	6	25.3 (0.0, 56.4)	**0.24 (0.06, 0.88)**	33	70 (53.1, 86.9)	0.75 (0.36, 1.56)
Any CAS with HIV-positive man in P6M (vs. no)	0	--	--	27	56.9 (36.5, 77.3)	0.96 (0.49, 1.87)
Any CAS with unknown status man in P6M (vs. no)	2	3.6 (0.0, 10.8)	0.80 (0.13, 3.30)	23	53.8 (33.6, 74.0)	**2.65 (1.34, 5.24)**
Used Ecstasy in P6M (vs. no)	4	55.2 (8.7, 100.0)	**4.22 (1.32, 13.51)**	12	21.6 (3.9, 39.3)	1.46 (0.63, 3.37)
Used crystal methamphetamine in P6M (vs. no)	7	64.1 (24.3, 100.0)	**15.98 (4.72, 54.09)**	30	59 (38.6, 79.5)	**3.58 (1.79, 7.14)**
Any injection drug use in P6M (vs. no)	5	53.2 (5.3, 100.0)	**19.89 (6.01, 65.90)**	19	32.8 (13.8, 51.8)	**3.47 (1.56, 7.76)**
		Median (Q1,Q3)	**OR (96% CI)**		**Median (Q1,Q3)**	**OR (95% CI)**
Age in years		40 (36, 46)	1.03 (0.99, 1.07)		47 (42, 50)	0.99 (0.96, 1.03)
Number of male anal sex partners in P6M		1 (0, 10)	0.98 (0.93, 1.05)		5 (1, 20)	1.01 (1.00, 1.02)

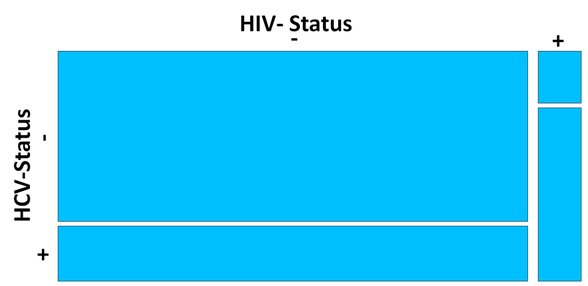

Figure 1. Mosaic plot of HIV and HCV status at enrollment among MSM in Vancouver, BC

Conclusions

- **New cases of HCV infection indicate a potential shift to sexual transmission among HIV-positive gay men based on the lack of association with recent injecting behavior.**
- **Crystal methamphetamine use remains a strong factor associated with HCV seropositivity and predictor of incident HCV infections.**

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