Sexual Behaviour is Associated with Recently Acquired HCV in HIV/HCV Co-infected MSM

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Introduction

Increasing HCV incidence in HIV-positive men-who-have-sex-with-men (MSM) has been documented in many countries over the past decade (1-8).

While injecting drug use (IDU) continues to place HIV-infected MSM at greater risk (6), other risk factors for HCV acquisition in MSM include condom-less anal intercourse, higher number of sexual partners, group sex, ulcerogenital sexually transmitted diseases and sexual acts that involve trauma and bleeding (2, 7, 8).

Given the burden of HCV-related disease among HIV co-infected individuals, strategies to enhance HCV assessment, treatment and prevention are urgently needed.

The aim of this analysis was to assess the socio-demographic, sexual behaviour and drug use characteristics of HIV/HCV co-infected individuals in Sydney, Australia, with recent HCV infection.

Methods

The Control and Elimination within Australia of Hepatitis C from people living with HIV (CEASE-D) prospective cohort study aims to characterise the socio-demographic, clinical and behavioural features of HIV/HCV co-infected individuals.

Adults (age ≥18 years) with HIV and current or prior HCV co-infection (HCV antibody positive) were eligible for study inclusion. This analysis included all participants who identified as MSM enrolled between July 2014 and December 2015 who had completed the enrolment behavioural questionnaire regarding sexual behaviour, drug use and HCV knowledge (n=218). Participants were enrolled through a network of tertiary hospitals (n=1) and primary care providers (n=4) in Sydney, Australia.

Exact logistic regression analysis was used to identify factors associated with recent (≤2 years from enrolment date) HCV acquisition in those with an estimated date of HCV infection (n=199).

Results

218 HIV/HCV co-infected MSM were included for analysis, of whom 25% (n=54) had recent HCV with an estimated duration of infection ≤2 years prior to enrolment.

Enrolment characteristics are summarised in **Table 1.**

Sexual behaviour and drug use (Table 2 and 3)

- 34% (n=75) had a regular male partner (RMP) (HIV positive 60%, HCV positive 12%) and 65% casual male partners (CMP).
- Participants with recent HCV infection were significantly more likely to have had at least 1 CMP within the previous 6 months (89% versus 60%; p<0.001).
- While 73% 'always' or 'sometimes' disclosed their HIV status to male partners, only 43% 'always' or 'sometimes' disclosed their HCV status. 43% 'never' disclosed their HCV status as compared with 14% regarding HIV status.
- IDU ever and current were reported by 82% and 44%, respectively, with amphetamines being the most commonly injected drug (**Figure 1**).

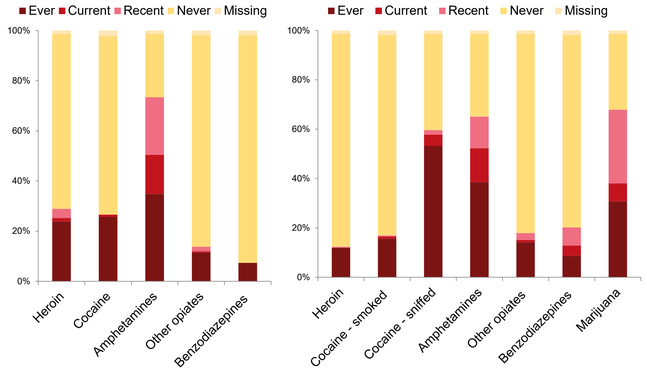

Figure 1. Injecting (Panel A) and non-injecting (Panel B) drug use behaviour. Ever: Drug use, but not in last 6 months. Current: Drug use in previous 6 months. Recent: Drug use in previous 30 days.

Table 1. Participant enrolment characteristics.

Clinical and virological characteristics	N=218
Mean age (SD)	48 (9)
Caucasian, n (%)	191 (88)
Median CD4 count (IQR)	600 (445, 803)
HIV viral load undetectable, n (%)	152 (70)
On cART, n (%)	211 (97)
Mode of HCV acquisition	
IDU	113 (52)
Sexual exposure	80 (37)
Other	25 (11)
HCV RNA detected, n (%)	183 (84)
HCV genotype, n (%)	
1	107 (58)
2	6 (3)
3	43 (24)
4	3 (2)
Mixed infection	1 (1)
Unknown/Missing	23 (13)
Previous HCV treatment, n (%)	74 (34)
Fibroscan performed within 6 months, n (%)	177 (81)
Liver stiffness measurement (categorised) , n (%)	
<7.1 kPa	111 (63)
7.1-9.4	27 (12)
9.5-12.5	13 (6)
>12.5	26 (12)

Table 2. Injecting and non-injecting drug use behaviour by time since estimated date of HCV infection.
≤2 years (recent, n=54) and >2 years (n=145)

Drug use characteristics		Recent HCV infection	HCV infection >2 years	P
IDU, n (%)	Ever	37 (69)	128 (88)	0.002
	Current	27 (50)	62 (43)	0.565
Age at 1st IDU, mean (SD)		34 (12)	27 (10)	0.002
Injecting drug use				
Heroin, n (%)	Ever	1 (2)	58 (40)	<0.001
	Current	0	11 (8)	0.038
Amphetamines, n (%)	Ever	33 (61)	115 (79)	0.031
	Current	25 (46)	53 (37)	0.427
Other opiates, n (%)	Ever	0	28 (19)	<0.001
	Current	0	4 (3)	0.576
Non-injecting drug use				
Amphetamines, n (%)	Ever	38 (70)	97 (67)	0.849
	Current	27 (50)	31 (21)	<0.001
Other opiates, n (%)	Ever	3 (6)	33 (23)	0.004
	Current	2 (4)	6 (4)	1.000

Table 3. Multivariate logistic regression analysis of factors associated with recent HCV infection in HIV/HCV infected MSM.
Time since estimated date of HCV infection – ≤2 years (recent, n=54) and >2 years (n=145).

Variables	Recent HCV infection	HCV infection >2 years	OR (95% CI)	P	AOR (95% CI)	P
Age (per 5 years)			0.73 (0.61, 0.88)	0.001	0.75 (0.60, 0.95)	0.015
Full or part-time employment	37 (69)	50 (34)	4.14 (2.12, 8.07)	<0.001	2.76 (1.19, 6.40)	0.018
Mode of HCV acquisition						<0.001
IDU	14 (26)	90 (62)	1.00	-	1.00	-
Sexual exposure	37 (69)	37 (26)	6.43 (3.12, 13.26)	<0.001	9.91 (3.84, 25.59)	<0.001
Other	3 (6)	18 (12)	1.07 (0.28, 4.12)	0.920	1.64 (0.37, 7.27)	0.518
Amphetamine non-IDU – current	27 (50)	31 (21)	3.45 (1.78, 6.80)	<0.001	2.93 (1.24, 6.95)	0.015
Male partners last 6 months						0.036
0-1	5 (9)	59 (41)	1.00	-	1.00	-
2-10	26 (48)	47 (32)	6.53 (2.33, 18.30)	<0.001	5.49 (1.61, 18.70)	0.007
>10	19 (35)	30 (21)	7.47 (2.54, 21.98)	<0.001	3.98 (1.13, 14.04)	0.032

HCV knowledge and treatment willingness

- Knowledge regarding behaviours associated with HCV transmission risk was variable (**Table 4**).
- Only 73% were aware of the potential for HCV reinfection.
- While many participants (57%) were not willing to receive interferon-based HCV therapy, most were willing (69%) to receive interferon-free therapy within the next 12 months (73%).

Table 4. Knowledge regarding behaviours associated with HCV acquisition

Proportion with correct response	N (%)
Sharing needles	190 (87)
Sharing other injecting equipment	160 (73)
Having a sexually transmitted infection	112 (51)
Body piercing and tattoos	134 (62)
Needle-stick injuries	156 (72)
Sharing personal-care items	136 (62)
Condom-less receptive anal sex	163 (75)
Fisting	119 (55)
Bleeding during sex	170 (78)
Sex toys	115 (53)
Sex with multiple partners	112 (51)
Group sex	114 (52)

Conclusion

Recent HCV infection in HIV-positive MSM was associated with younger age, full or part time employment, sexual HCV acquisition, higher number of male partners in the 6 months prior to enrolment and current non-injecting amphetamine use.

Limited knowledge around sexual transmission risk and HCV status disclosure is concerning. Awareness of sexual and drug use behaviour in this population may help target health strategies and interventions.

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References:

1. Matthews GV, Pham ST, Hellard M et al. Patterns and characteristics of hepatitis C transmission clusters among HIV-positive and HIV-negative individuals in the Australian trial in acute hepatitis C. Clin Inf Dis. 2011;52(6):803-11.
2. Wandeler G, Gsponer T, Bregenzer A et al. Hepatitis C virus infections in the Swiss HIV Cohort Study: a rapidly evolving epidemic. Clin Inf Dis. 2012;55(10):1408-16.
3. Centers for Disease Control and Prevention. Sexual transmission of hepatitis C virus among HIV-infected men who have sex with men--New York City, 2005-2010. MMWR. 2011;60(28):945-50.
4. Schmidt AJ, Rockstroh JK, Vogel M et al. Trouble with bleeding: risk factors for acute hepatitis C among HIV-positive gay men from Germany--a case-control study. PLoS One. 2011;6(3):e17781.
5. van de Laar T, Pybus O, Bruisten S et al. Evidence of a large, international network of HCV transmission in HIV-positive men who have sex with men. Gastroenterology. 2009;136(5):1609-17.
6. Gamage DG, Read TR, Bradshaw CS et al. Incidence of hepatitis-C among HIV infected men who have sex with men (MSM) attending a sexual health service: a cohort study. BMC infectious diseases. 2011;11:39.
7. Gambotti L, Batisse D, Colin-de-Verdiere N et al. Acute hepatitis C infection in HIV positive men who have sex with men in Paris, France, 2001-2004. Euro surveillance: bulletin Europeen sur les maladies transmissibles.. 2005;10(5):115-7.
8. Danta M, Brown D, Bhagani S et al. Recent epidemic of acute hepatitis C virus in HIV-positive men who have sex with men linked to high-risk sexual behaviours. AIDS. 2007;21(8):983-91.