Predictors and incidence of sexually transmitted Hepatitis C virus infection in HIV positive men who have sex with men

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Background:

Sexual transmission of HCV

- Well established route of transmission
- HIV positive MSM are at highest risk
- Some known risk factors include:
  - Condomless anal sex
  - Practices that expose the anorectal mucosa to blood (fisting, toys, douching)
  - Ulcerative STIs: Syphilis
  - Different risk factors studied in different cohorts with different population types
- Mechanism of transmission and how risk factors interact are poorly understood

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Aims:

- Examine incidence of sexually transmitted HCV infection in HIV positive MSM in care at MSHC
- Determine which factors associated with increased incidence:
  - Host biological factors: viral load, CD4, ART
  - Anorectal chlamydia: associated with sexual behaviour but not ulceration
  - Syphilis: associated with sexual behaviour and also with ulceration

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Methods:

Retrospective cohort of HIV positive MSM at MSHC:

- Two or more HCV antibody tests (first test negative) 2008-2016
- Extracted clinical, laboratory data from electronic medical record
- Excluded any with history of injecting
  - From the denominator: as recorded on computer assisted self interview (CASI) sexual behaviour
  - From the numerator: careful examination of the medical record

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Methods

Calculated incidence based exposure time between a negative HCV antibody test and the following test (negative or positive).

Categorised that exposure/testing interval by:

- CD4 cell count, viral load, ART
- Overlap with a testing interval in which incident anorectal chlamydia or syphilis was detected

Cox regression (time to HCV infection) using those covariates.

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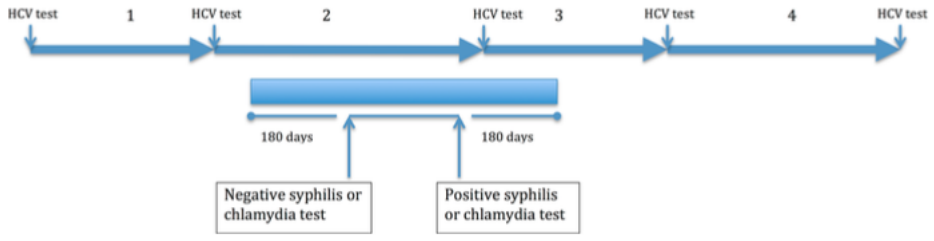
Methods



Compared HCV testing intervals associated or not associated *in time* with newly acquired syphilis or chlamydia

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Results:

Table 1 Characteristics of 822 HIV-positive MSM patients during the study period

	Total[a] (*N* = 822)
Age in years, mean (±SD)[b]	43.1 (±12.5)
Born outside Australia or New Zealand, n (%)[c]	312 (38.0%)
CD4 nadir cells/uL, mean (±SD)	362 (± 186)
Years since HIV diagnosis, mean (±SD)[b]	6.8 (±7.2)
Never supressed viral load, n(%)[d]	28 (3.4%)
Any incident syphilis, n(%)[e]	205 (24.9%)
2 or more syphilis, n(%)[e]	60 (7.3%)
Any anorectal chlamydia, n(%)[f]	165 (20.1%)
2 or more anorectal chlamydia, n(%)[f]	70 (8.5%)
Number HCV tests, mean(±SD)[g]	3.2 (2.0)
Ever HBV infected, n(%)[h]	232 (28.2%)
Possible incident HBV, n(%)[i]	5 (0.6%)
Patient years follow-up, mean (±SD)	3.8 (±1.6)

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Results

37 new HCV infections in 822 HIV positive MSM with no known injecting drug use:

- 34 antibody positive and 3 PCR positive
- 28 had raised LFTs
  - 15: > 5 x ULN
  - 10: 2-5xULN

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Results:

Incidence

- 1.19/100PYs (95%CI 0.99-1.38) overall
- 4.72/100PYs (95%CI 3.35-6.08) around time of syphilis incidence
- 1.37/100PYs (95%CI 0.81-1.93) around time of anorectal chlamydia incidence

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Results

Table 2 Incidence, crude and adjusted hazards ratio for incidence HCV infection. Cox Regression Analysis

	Incident HCV cases	PYs	Incidence (cases/100PY)	Unadjusted HR (95%CI)	*p*-value	Adjusted HR (95%CI)	*p*-value
Total	37	3114	1.19 (0.99–1.38)				
Age[a]	37	3193		**0.61 (0.45–0.83)**	**.002**	**0.67 (0.48–0.92)**	**.014**
Country of birth							
Australia/New Zealand	26	1927	1.35 (1.08–1.61)	1 (ref)			
Other	9	1053	0.85 (0.57–1.14)	0.64 (0.30–1.37)	0.250		
CD4 count [b]							
Most recent CD4	37	3114		**1.11 (1.00–1.23)**	**.054**	1.00 (0.85–1.18)	.965
Lowest CD4 [c]	37	3114		**1.20 (0.95–1.52)**	**.121**	**1.26 (1.01–1.58)**	**.044**
Year of HCV Test	37	3114		1.12 (0.94–1.34)	.208		
HIV viral load suppression [d]							
No	6	188	3.19 (1.89–4.49)	1 (ref)	–		
Yes	31	2926	1.06 (0.87–1.25)	**0.33 (0.14–0.79)**	**.012**	0.51 (0.20–1.27)	.146
Exposure *peri*-incident syphilis[e]							
No	25	2859	0.87 (0.70–1.05)	1 (ref)	-		
Yes	12	254	4.72 (3.35–6.08)	**5.73 (2.86–11.45)**	**<.001**	**4.96 (2.46–9.99)**	**<.001**
Exposure *peri*-incident anorectal chlamydia[f]							
No	31	2676	1.16 (0.95–1.93)	1 (ref)			
Yes	6	438	1.37 (0.81–1.93)	1.19 (0.49–2.84)	.703		
Ever HBV infected[g]							
No	29	2142	1.35 (1.10–1.61)	1 (ref)	-		
Yes	8	972	0.82 (0.53–1.11)	0.61 (0.28–1.33)	.214		

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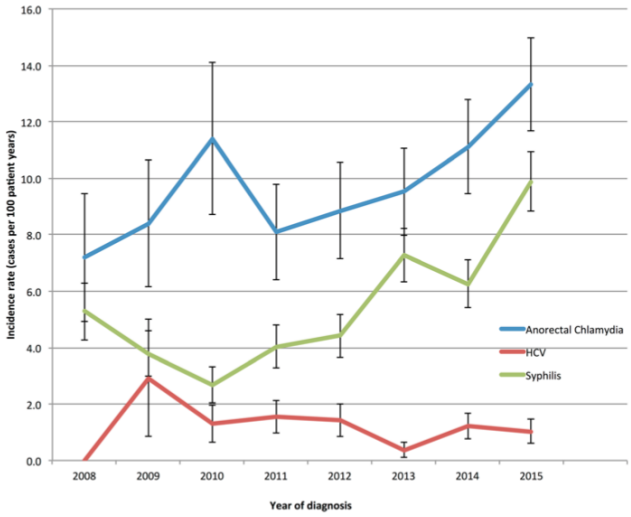
Results



Incidence of sexually transmitted HCV, anorectal chlamydia and syphilis

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Discussion:

Incidence of sexually transmitted HCV, incidence of syphilis and incidence of anorectal chlamydia not previously compared *in time*.

HCV incidence associated *in time* with syphilis but not anorectal chlamydia.

Too few exposure with unsuppressed viral load or preART to know if ART is protective.

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Discussion

Clinically:

- 1:100 will acquire HCV every year
- 1:20 will acquire HCV in the 12 months around being diagnosed with incident syphilis
- LFTs disturbance should prompt testing for HCV.
- Consider PCR.

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Discussion

Suggests the risk modification is biological rather than behavioural.

Increasing incidence of syphilis may offset declining HCV transmission through treatment as prevention.

Will sexual HCV transmission increase in HIV negative MSM?

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