



Stable incidence of hepatitis C virus infection among PWID in an Australian prison setting, 2005-2014: the HITS-p study

Evan B. Cunningham¹, Brigid Betz-Stablein², Neil A. Bretana², Gregory J. Dore¹, Behzad Harjarizadeh¹, Fabio Luciani¹, Suzy Teutsch², Andrew R. Lloyd*¹ and Jason Grebely*¹ on behalf of the HITS-p investigators

¹The Kirby Institute, UNSW Australia, Sydney, Australia

² Inflammation and Infection Research Centre, School of Medical Sciences, UNSW Australia, Sydney, Australia

HCV in prison

- Injecting drug use is known to continue in prison and therefore onward transmission of HCV occurs in prison
 - Global prevalence (HCV Ab+): 26%
 - Global incidence (among ever PWID): 16.4 per 100py
- HCV prevention strategies such as needle syringe programs (NSP), and opioid substitution treatment (OST) are either not available or have low coverage in many global prison settings
 - In Australia OST is available and inmates are given access to bleach for cleansing injecting equipment

HCV in prison

- Given the high prevalence of HCV and the high risk for HCV acquisition in the prison setting, this represents a key setting in which to implement new treatment and prevention measures
 - Including NSP and treatment as prevention
- Understanding the incidence of HCV infection and the trends in incidence in recent years is needed to inform prevention strategies
- Previous studies have been limited by retrospective design, short follow-up periods, small sample sizes, and limited to single institutions

Aims

- **HITS-p:** A prospective, multi-prison study of PWID between 2005 and 2014 the aims of this study were to:
 1. **Determine the temporal trends in HCV incidence**
 2. **Determine factors associated with time to HCV seroconversion**

Study population and design

The Hepatitis C Incidence and Transmission study – prisons

- Adult male and female prison inmates were recruited in 23 correctional centres and followed across 30 of 35 centres

Inclusion criteria:

- Incarcerated in one of the NSW prisons where recruitment occurred
- Lifetime history of IDU
- 18 years or older
- HCV antibody and RNA negative at enrolment
- At least one follow-up visit after enrolment
 - Either continuously incarcerated or re-incarcerated after a period of release to community
- Provided informed written consent

Study assessments

- At enrolment, participants were interviewed using a questionnaire to determine demographic characteristics and risk behaviour
- Every 6-12 months, participants completed a follow-up interview
- All interviews were done by study nurses outside of the custodial authority
- At each interview a blood sample was taken to test for HCV
- HCV results were given by the study nurse and participants were referred to clinical services and treatment if appropriate

Statistical analyses

- **Study endpoint:** HCV seroconversion
 - An HCV antibody or HCV RNA positive test following a HCV negative status at previous visit
- **Factors associated with time to HCV seroconversion:**
 - Time updated Cox proportional hazards analyses
 - Follow-up time truncated at 5 years post enrolment

Baseline characteristics

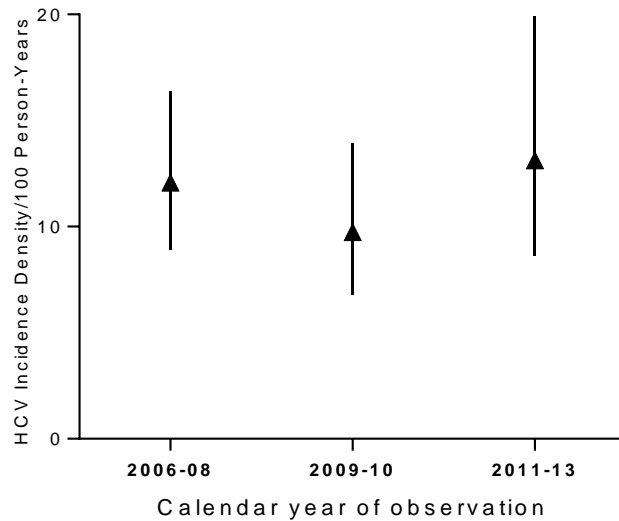
Characteristic, n (%)	Overall, n (%) (n=320)
Age, median (25%, 75%)	26 (22-32)
Female sex	91 (28)
>10 years of schooling	76 (24)
Injecting drug use ever	320 (100)
Heroin	206 (64)
Cocaine	143 (45)
Methamphetamine	248 (78)
Any sharing of injection equipment ever	208 (65)
Injecting drug use since entering prison	104 (33)
Sharing of needle and syringe since entering prison	81 (78)*
Current opioid substitution treatment	49 (15)

* Of those who injected since entering prison

Trends in incidence

Overall population

- 11.4 /100 py (9.3-14.0)



Factors associated with HCV seroconversion

Overall population

Variable	HR	95% CI	P
Age (10 year increments)	0.62	0.43-0.88	0.008
Female sex	1.51	0.98-2.34	0.063
≤10 years of schooling	1.39	0.80-2.41	0.247
Methamphetamine injecting	1.84	1.22-2.77	0.004
Cocaine injecting	1.99	1.19-3.34	0.009
Heroin injecting	3.50	2.33-5.27	<0.001
Buprenorphine/methadone injecting	2.05	1.18-3.58	0.011
Other opioid injecting	1.79	0.98-3.24	0.056
Frequency of injecting (vs. no injecting)			
< Weekly	1.59	0.76-3.29	0.216
≥ Weekly	4.95	2.93-8.37	<0.001
Syringe sharing	2.27	1.48-3.46	<0.001

Factors associated with HCV seroconversion

Continuously imprisoned population

Variable	HR	95% CI	P
Age (10 year increments)	0.73	0.43-1.26	0.256
Female sex	0.91	0.40-2.11	0.834
≤10 years of schooling	1.12	0.48-2.60	0.789
Methamphetamine injecting	1.59	0.78-3.24	0.199
Cocaine injecting	1.15	0.35-3.77	0.822
Heroin injecting	2.67	1.30-5.48	0.007
Buprenorphine/methadone injecting	1.24	0.37-4.16	0.726
Other opioid injecting	1.20	0.36-4.00	0.767
Frequency of injecting (vs. no injecting)			
< Weekly	2.40	0.95-6.09	0.065
≥ Weekly	3.34	1.48-7.57	0.004
Syringe sharing	3.60	1.79-7.26	<0.001

Implications

- Syringe sharing was associated with HCV infection among continually imprisoned participants, irrespective of frequency of injecting or the type of drug injected
- Each individual injecting event carries with it a higher chance of HCV infection due to the scarcity of clean injecting equipment
- Even people with a lower frequency of injecting drug use in the prison environment have a high risk of infection

Conclusions

- Current prevention strategies have failed to reduce the incidence of HCV infection in the NSW prison setting between 2005 and 2014
- Prison remains a high risk environment for acquisition of HCV infection
- Due to the scarcity of clean injecting equipment in prison, each injection event carries with it a high risk of HCV infection
- Further studies are needed to fully understand the risk behaviours of PWID in the prison setting

Acknowledgements

HITS-p study participants

HITS-p investigators

UNSW Australia

A/Prof. Jason Grebely
Prof. Andrew Lloyd (PI)
Prof. Gregory Dore
Dr. Behzad Hajarizadeh
Dr. Tanya Applegate
Dr. Fabio Luciani
Neil Bretana
Dr. Brigid Betz-Stablein
Dr. Suzy Teutsch



Australian Government

National Health and Medical Research Council



National CIHR Research Training
Program in Hepatitis C

Subvention nationale de formation
des IRSC sur l'hépatite C