Changes in injection drug use among recently hepatitis C virus-infected persons who inject drugs offered treatment in Montreal, Canada

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New therapies for Hepatitis C: New questions

- Interferon-based therapies are effective among PWID, yet treatment uptake is low

- Interferon-free regimens will likely address many of the current barriers to treatment such as concerns with adherence and susceptibility to side effects

- However, concerns about ongoing drug use and the potential for re-infection are likely to persist or increase

- Limited research has investigated injection drug use patterns following receipt of HCV treatment

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Potential impact of HCV treatment on injection drug use

- Access to counseling and preventive health messages among PWID engaged in HCV treatment could lead to changes in injection drug use[1,2]

- Concurrent access to ancillary health care services and support, including primary and psychiatric care, addiction counseling and treatment may also play a role[3,4]

- In a sample of 124 PWID in Sydney, no differences in injection drug use were found among treated and untreated participants followed for a median of 1.8 years[5]

- Untreated participants represent a heterogeneous group with respect to treatment access and medical follow-up

[1]Bruneau J et al. Clin Infect Dis. 2014; [2]Aspinall E et al. Int J Drug Policy. 2013; [3]Nambiar D et al. Drug Alcohol Depend. 2015; [4]Saitz R et al. Addiction. 2005; [5]Alavi M et al. Int J Drug Policy. 2015

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Objective

- To examine changes in injection drug use over the course of one year in a sample of active PWID recently infected with HCV who were systematically referred for HCV clinical assessment and treatment and offered tailored health care services

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IMPACT Study

- A longitudinal prospective study examining behaviour and quality of life changes among acute HCV-infected PWID offered treatment and access to tailored health care services (2007- 2015)

- Recruitment through a community-based prospective study of PWID (St. Luc/HEPCO Cohort), community- and hospital-based collaborating clinics in Montréal

- Eligibility criteria: past six-month injection drug use and documented acute HCV infection[*]

*Defined as either i) an anti-HCV antibody or RNA positive test within six months following an anti-HCV antibody negative test, and ii) an acute symptomatic infection with evidence of hepatitis illness (i.e., jaundice or alanine aminotransferase (ALT) elevation ≥ 10 times the upper limit)
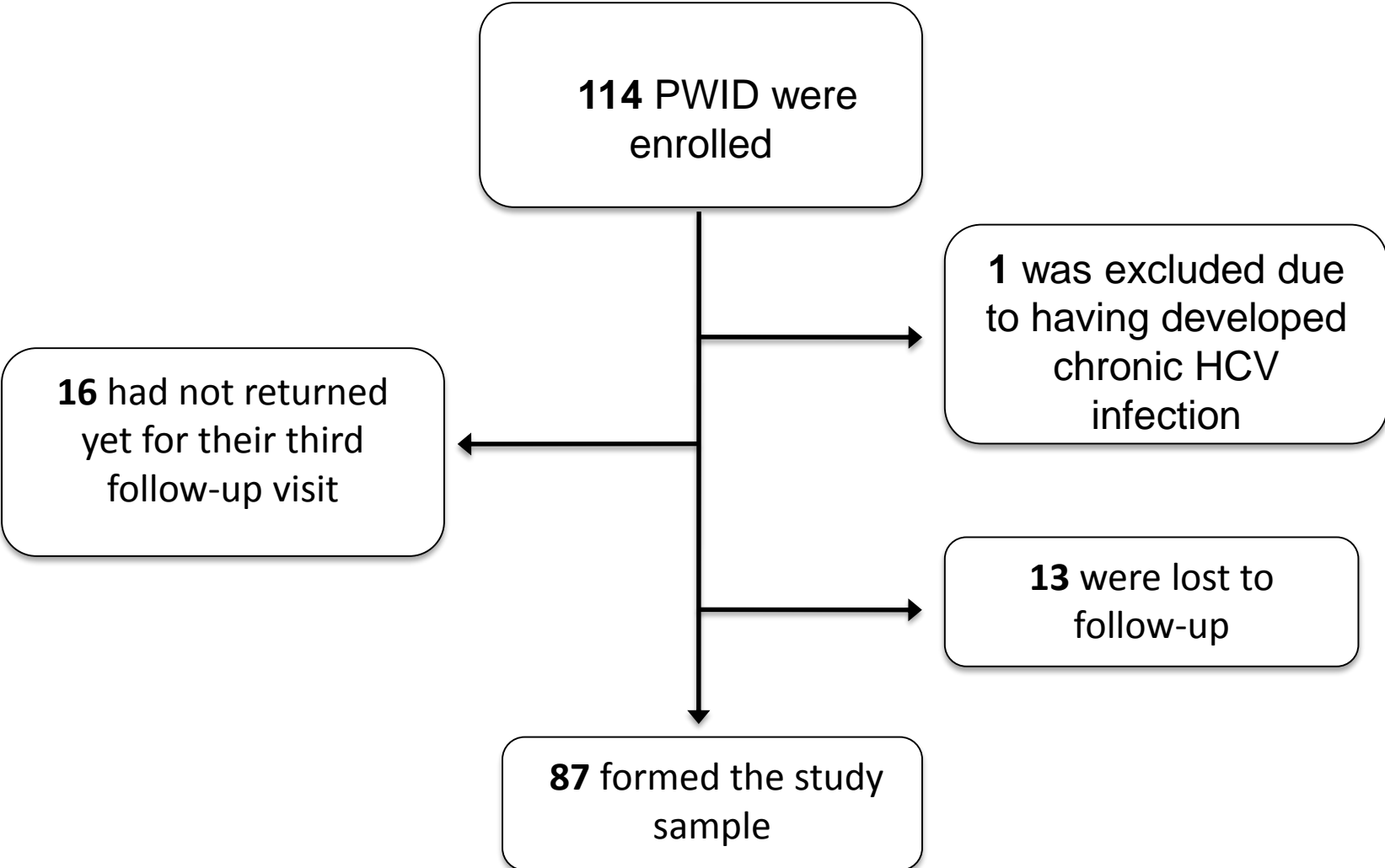
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IMPACT Study

- Eligible PWID were systematically referred to the CHUM Addiction medicine clinic for HCV-infection follow-up, assessment for treatment suitability and HCV-related care
  - PWID who did not resolve spontaneously within 20 weeks of estimated infection were assessed for treatment
  - PWID willing to be treated but with contra-indications to interferon therapy due to severe psychiatric co-morbidity or uncontrolled drug use were offered tailored health care services
  - Eligible PWID were offered pegylated interferon for 12-24 weeks

- Participants were enrolled in the study within 6 months following receipt of their HCV test result, and were followed every 6 months for up to 4 study visits

- An interviewer-administered questionnaire was used to collect socio-demographic characteristics, injection drug use and related behaviours
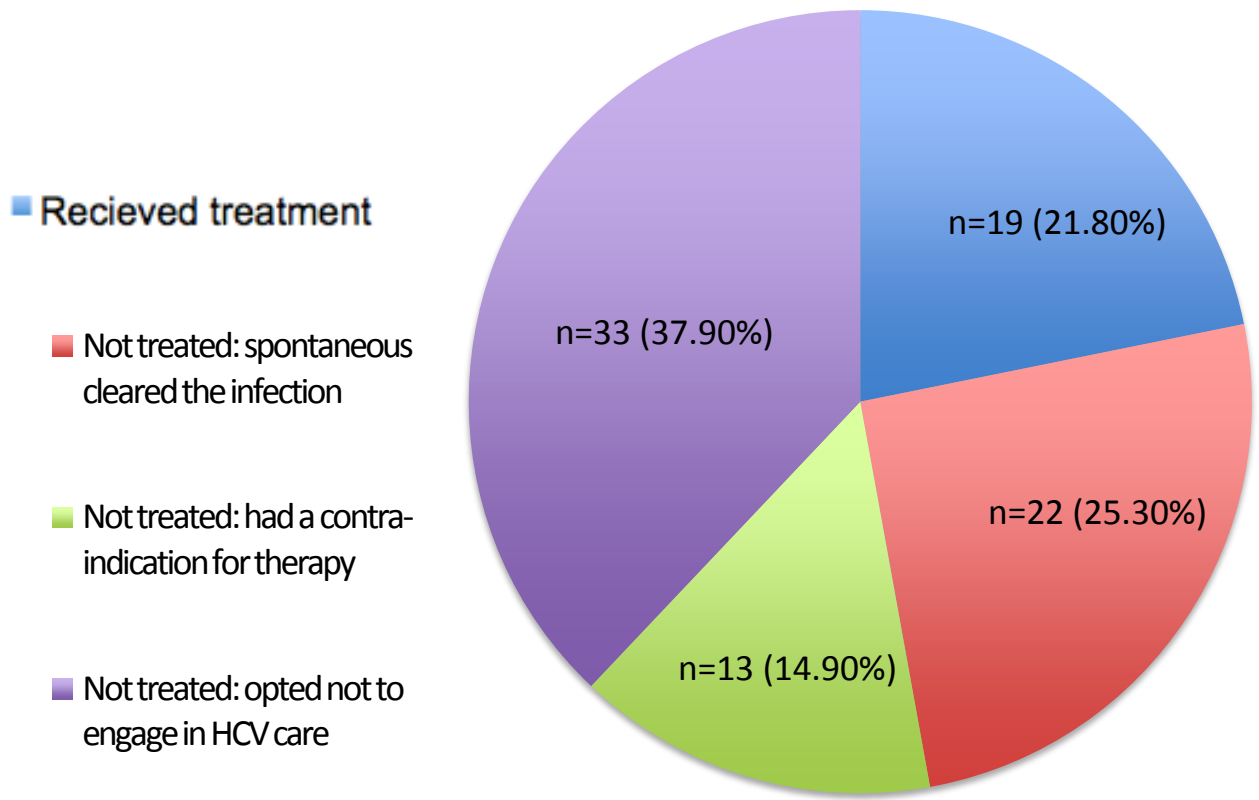
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Measures and statistical analyses

- Outcome variable: past-month injection drug use assessed at 12-month follow-up

- Primary exposure variable: HCV treatment, defined as received treatment or did not receive treatment because of:
  - having spontaneously cleared the infection
  - presenting with a contra-indication to treatment
  - chose not to engage in HCV care

- Logistic regression analyses to assess the association between HCV treatment and injection drug use at follow-up, adjusting for baseline injection drug use, socio-demographic factors, duration of injection, homelessness and receipt of opiate agonist therapy

Study sample

114 PWID were enrolled

1 was excluded due to having developed chronic HCV infection

16 had not returned yet for their third follow-up visit

13 were lost to follow-up

87 formed the study sample

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HCV treatment (n= 87)

Legend:
- Recieved treatment
- Not treated: spontaneous cleared the infection
- Not treated: had a contra-indication for therapy
- Not treated: opted not to engage in HCV care

Pie chart values:
- n=19 (21.80%)
- n=22 (25.30%)
- n=13 (14.90%)
- n=33 (37.90%)

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Descriptive characteristics at baseline assessment (n=87)

Characteristic	Total N=87 n (%)	RT (N=19) n (%)	NT-SR (N=22) n (%)	NT-CI (N=13) n (%)	NT-NE (N=33) n (%)
Age [Mean (SD)]	35.6 (10.2)	34.9 (9.3)	36.6 (9.5)	39.7 (12.4)	33.7 (10.2)
Male gender	68 (78.2%)	15 (79.0%)	16 (72.7%)	10 (76.9%)	27 (81.8%)
Completed high school education	51 (58.6%)	14 (73.7%)	12 (54.6%)	7 (53.9%)	18 (54.6%)
Recent homelessness	37 (42.5%)	6 (31.6%)	10 (45.5%)	6 (46.2%)	15 (45.5%)
Injection drug use in past month	76 (87.4%)	14 (73.7%)	19 (86.4%)	13 (100%)	30 (90.9%)
Current opiate agonist therapy	33 (37.9%)	10 (52.6%)	9 (40.9%)	5 (38.5%)	9 (27.3%)
Injected for 8 years or more	44 (50.6%)	9 (47.4%)	13 (59.1%)	7 (53.9%)	15 (45.5%)

RT: received treatment

NT-SR: not treated, spontaneously cleared the infection

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Associations between HCV treatment, socio-demographics and drug-related behaviours, and injection drug use at one-year follow-up (n=87)

Characteristic	uOR (95% CI)
HCV treatment	
RT versus NT-NE	0.15 (0.04 - 0.61)**
NT-SR versus NT-NE	0.30 (0.08 - 1.18)
NT-CI versus NT-NE	0.22 (0.05 - 1.02)*
Age (5-year increase)	0.95 (0.91 - 0.99)*
Male versus female gender	0.86 (0.27 - 2.70)
Completed high-school education	0.92 (0.36 - 2.38)
Injection drug use in past month	3.6 (0.99 - 13.15)*
Recent homelessness	1.16 (0.45 - 2.98)
Current opiate agonist therapy	0.70 (0.27 - 1.82)
Injected for 8 years or more	0.92 (0.36 - 2.34)

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NT-NE: not treated, chose not to engage in HCV care

*$p \leq 0.05$; **$p < 0.01$

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Associations between HCV treatment and injection drug use at one-year follow-up, adjusting for baseline characteristics (n=87)

Characteristic	uOR (95% CI)	aOR (95% CI)
HCV treatment		
RT versus NT-NE	0.15 (0.04 - 0.61)**	0.18 (0.04 - 0.76)*
NT-SR versus NT-NE	0.30 (0.08 - 1.18)	0.34 (0.08 - 1.40)
NT-CI versus NT-NE	0.22 (0.05 - 1.02)*	0.24 (0.05 - 1.22)
Age (5-year increase)	0.95 (0.91 - 0.99)*	0.95 (0.90 - 0.97)*
Male versus female gender	0.86 (0.27 - 2.70)	1.10 (0.30 - 4.05)
Completed high-school education	0.92 (0.36 - 2.38)	
Injection drug use in past month	3.6 (0.99 - 13.15)*	3.98 (0.91 - 17.34)
Recent homelessness	1.16 (0.45 - 2.98)	
Current opiate agonist therapy	0.70 (0.27 - 1.82)	
Injected for 8 years or more	0.92 (0.36 - 2.34)	

RT: received treatment

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NT-NE: not treated, chose not to engage in HCV care

*$p \leq 0.05$; **$p < 0.01$

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Discussion

- PWID who received treatment had lower injection drug use at follow-up compared to those who opted not to engage in HCV care
  - Access to close monitoring, education and counseling during treatment; access to an individualized treatment plan in a multidisciplinary healthcare setting; potential for self-selection

- A non-significant trend for lower injection drug use at follow-up was observed among PWID who had a contra-indication to therapy and those who spontaneously resolved their infection compared to those who opted not to engage in HCV care
  - Age differences; increased medical intervention and care

- Self-reported past 6-month regular medical care at one-year follow-up
  - PWID who received treatment: 84%
  - PWID who spontaneously resolved their infection: 76.9%
  - PWID with a contra-indication to treatment: 68.2%
  - PWID who opted not to engage in HCV care: 42.4%

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Conclusions/future directions

- Importance of offering readily access to HCV assessment and treatment to HCV-infected PWID

- HCV treatment may be one of several interventions around HCV care that are likely to positively impact injection drug use behaviours

- PWID for whom treatment is not indicated, or readily available, would likely benefit from timely engagement in care addressing their substance use, mental health and/or related conditions

- Future research is needed to examine which aspects of HCV care are likely to influence behaviours, and to investigate long-term changes following engagement in HCV care

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