Hepatitis C virus testing, liver disease assessment and treatment uptake among people who inject drugs pre- and post-universal access to direct-acting antiviral treatment in Australia: The LiveRLife study

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Introduction

- Morbidity and mortality associated with hepatitis C virus (HCV) infection is rising globally.
- People who inject drugs (PWID) are a priority population to test and treat for HCV in efforts to meet the World Health Organization (WHO) elimination targets of 80% reduction in new HCV infections and 65% reduction in HCV-related mortality by 2030.
- Gaps in HCV testing and diagnosis, liver disease assessment and treatment uptake among people who inject drugs (PWID) persist.

Aims

- To describe the HCV care cascade among PWID.
- To examine factors independently associated with significant fibrosis.
- To examine HCV treatment uptake in the pre-DAA and DAA eras, and identify factors associated with DAA treatment uptake.

Methods

Study design and participants

- LiveRLife is an observational cohort study assessing an intervention integrating liver health promotion campaign and non-invasive liver fibrosis assessment on linkage to care and HCV treatment uptake among PWID.
- Participants were enrolled at 16 sites (12 drug & alcohol clinics, 1 medically supervised injecting Centre, 1 community health clinic, 1 Aboriginal Medical Service, 1 needle and syringe program) in Australia between August 2014 and February 2018.
- Inclusion criteria were age of 18 years or older, written informed consent and a history of injection drug use. Current pregnancy was the only exclusion criterion.

Study procedures

- Each site typically held four campaign days. Enrolment assessments included HCV RNA testing, self-administered survey, liver disease assessment and clinical consultation (Figure 1).
- Participants were asked to return 2 – 12 weeks post enrolment to receive HCV test results and for clinical follow-up.
- Australian government-funded unrestricted access to DAA therapy commenced in March 2016.

Statistical analyses

- The HCV care cascade (HCV RNA prevalence, linkage to care and treatment initiation) was described pre- and post- access to DAA therapy.
- Unadjusted and adjusted logistic regression models with odds ratios and 95% confidence intervals were generated to assess factors associated with significant liver disease (METAVIR F2 – F4) with significance defined at P<0.05.
- Unadjusted and adjusted logistic regression models with odds ratios and 95% confidence intervals were generated to assess factors associated with HCV DAA treatment uptake with significance defined at P<0.05.

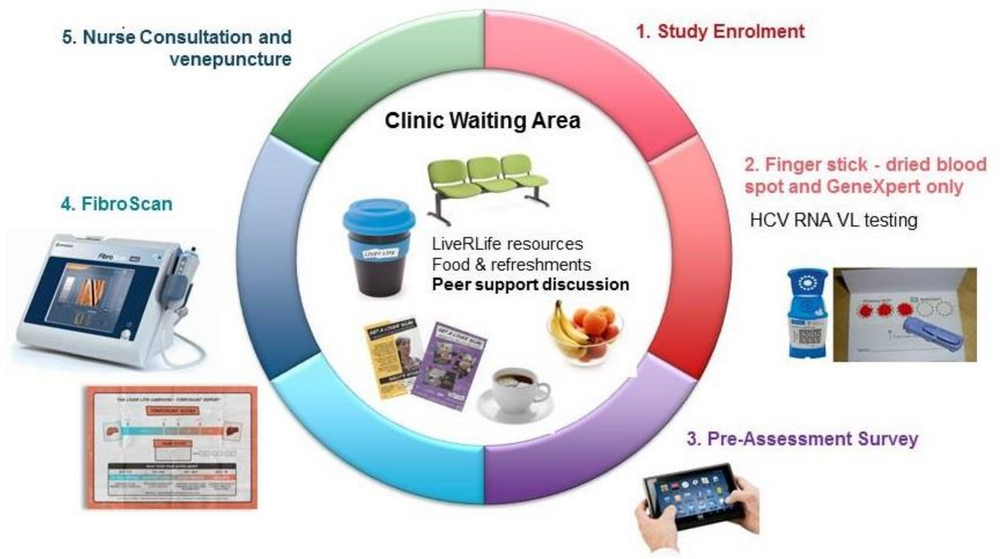

Figure 1. *LiveRLife study assessments*

Results

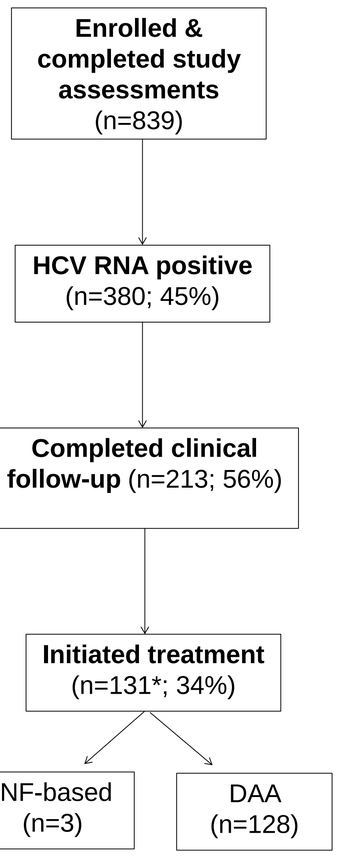

Figure 2. *Participant disposition *Includes already on treatment at Enrolment; INF=interferon-based*

Table 1. *Baseline characteristics*

Characteristic	Total (n=839), n (%)§	HCV RNA negative (n=396), n (%)	HCV RNA positive (n=380), n (%)
Age groups			
18 – 35	189 (23%)	96 (24%)	74 (19%)
36 – 45	313 (37%)	136 (34%)	153 (40%)
≥46	337 (40%)	164 (42%)	153 (40%)
Male	550 (66%)	241 (61%)	265 (70%)
Aboriginal/Torres Strait Islander	190 (23%)	102 (26%)	72 (19%)
Unstable Housing	262 (31%)	107 (27%)	127 (33%)
Incarceration*			
Never	270 (32%)	147 (37%)	105 (28%)
Ever (not in past 12 months)	391 (47%)	186 (47%)	176 (46%)
In past 12 months	160 (19%)	54 (14%)	91 (24%)
Injected drugs in past month*	537 (64%)	239 (60%)	251 (66%)
Alcohol consumption (AUDIT-C)*			
Never drinks	362 (43%)	173 (44%)	166 (44%)
Low risk male/female	170 (20%)	88 (22%)	72 (19%)
High risk male/female	281 (33%)	124 (31%)	130 (34%)
Opioid substitution treatment			
Never	161 (19%)	91 (23%)	49 (13%)
Previous treatment, not current	99 (12%)	49 (12%)	40 (11%)
Current treatment	560 (67%)	246 (62%)	283 (74%)
FibroScan® Liver disease staging			
F0/F1 – No/mild fibrosis	568 (68%)	299 (76%)	224 (59%)
F2 – Moderate fibrosis	102 (12%)	37 (9%)	59 (16%)
F3 – Severe fibrosis	54 (6%)	15 (4%)	32 (8%)
F4 – Cirrhosis	66 (8%)	19 (5%)	46 (12%)
Invalid	37 (4%)	20 (5%)	16 (4%)
Result unavailable	12 (1%)	6 (2%)	2 (1%)

§ HCV RNA test result missing/invalid (n=63; 8%); *Participants missing demographic survey (n=18); Unstable housing: staying temporarily with friends, shelter/refuge, street/homeless; AUDIT-C: scores ≥4 in men and ≥ 3in women considered as high-risk alcohol drinking

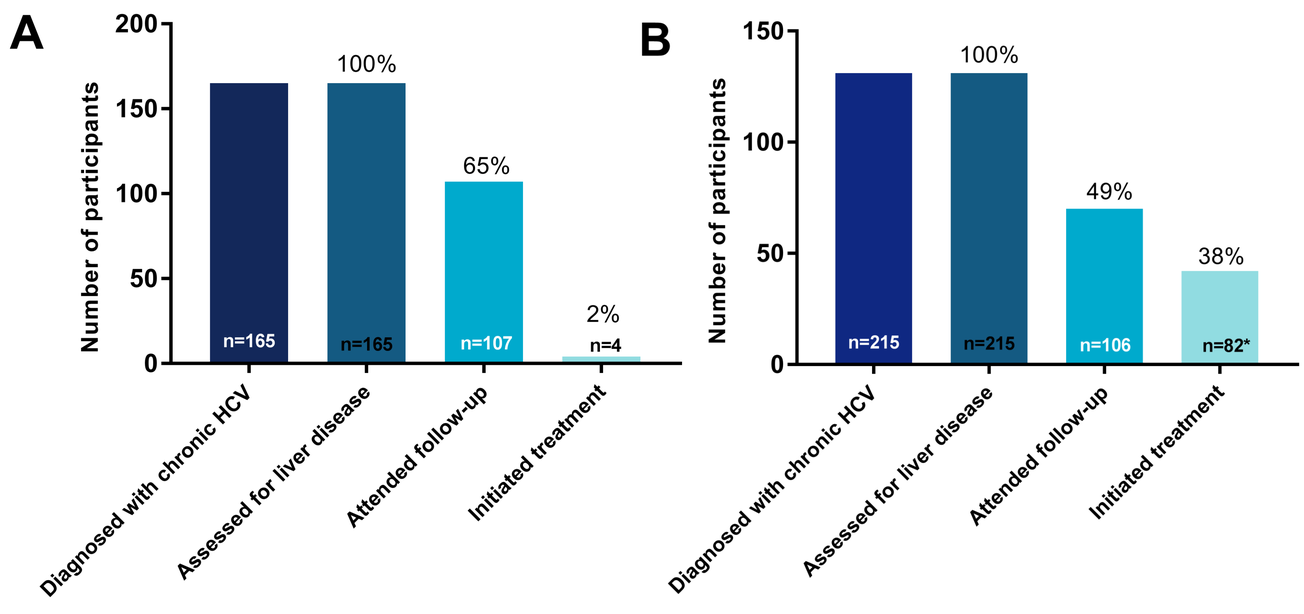

Figure 3. *Pre- and post-universal DAA access cascade of HCV care among participants with HCV infection with 12 months of follow-up to treatment uptake: A) among participants enrolled prior to availability of DAA starting March 2016; B) Among participants enrolled after the availability of DAA therapy; *Includes already on treatment at enrolment.*

- In adjusted analysis, older age [(36- 50 years group: adjusted odds ratios (aOR), 1.91; 95% CI, 1.19 – 3.08), (≥51 years group: aOR, 3.17; 95% CI, 1.87 – 5.34)], BMI ≥30 (aOR, 2.51; 95% CI, 1.66 – 3.81) and detectable HCV RNA (aOR, 2.79; 95% CI, 1.95 – 3.99) were associated with significant fibrosis.
- In adjusted analysis, age ≥50 years (aOR, 2.88; 95% CI, 1.18 – 7.04) and having attended a clinical follow-up with a nurse (aOR, 3.19; 95% CI, 1.61 – 6.32) or physician (aOR, 11.83; 95% CI, 4.89 – 28.59) were independently associated with HCV DAA treatment uptake.

Conclusion

- LiveRLife campaign identified high prevalence of HCV infection and significant liver disease burden among PWID.
- HCV treatment uptake among PWID has increased markedly in the DAA era.
- Innovative models of care are required to further enhance treatment uptake in order to achieve the WHO goal of eliminating HCV as a public health by 2030.

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