PREVENTION OF HCV IN PEOPLE WHO INJECT DRUGS

Holly Hagan, PhD
Professor
Co-Director, Center for Drug Use and HIV Research
Principal Investigator, HCV Synthesis Project
New York University
HCV prevalence in PWID in the countries with the greatest # PWID

<table>
<thead>
<tr>
<th></th>
<th>HCV prevalence</th>
<th># PWID with HCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>67%</td>
<td>1.6 million</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>73%</td>
<td>1.3 million</td>
</tr>
<tr>
<td>United States</td>
<td>73%</td>
<td>1.5 million</td>
</tr>
</tbody>
</table>

About 10 million PWID worldwide might be infected with HCV

Time to HCV infection in PWID, high-middle income countries post-1995

<table>
<thead>
<tr>
<th>Years since onset of injection</th>
<th>HCV prevalence</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>32%</td>
<td>25 – 39%</td>
</tr>
<tr>
<td>2</td>
<td>37%</td>
<td>29 – 42%</td>
</tr>
<tr>
<td>3</td>
<td>43%</td>
<td>33 – 53%</td>
</tr>
<tr>
<td>5</td>
<td>53%</td>
<td>41 – 65%</td>
</tr>
<tr>
<td>10</td>
<td>73%</td>
<td>56 – 85%</td>
</tr>
<tr>
<td>15</td>
<td>83%</td>
<td>63 – 93%</td>
</tr>
</tbody>
</table>

## HCV in PWID in Europe

<table>
<thead>
<tr>
<th></th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCV Incidence</td>
<td>13/100 PY</td>
<td>3 – 67/100 PY</td>
</tr>
<tr>
<td>Prevalence of chronic HCV infection</td>
<td>72%</td>
<td>IQR 64 – 81%</td>
</tr>
<tr>
<td>HIV-HCV co-infection</td>
<td>4%</td>
<td>IQR 0.2 – 28%</td>
</tr>
<tr>
<td>Undiagnosed HCV infection</td>
<td>49%</td>
<td>IQR 38 – 64%</td>
</tr>
<tr>
<td>Proportion of chronic infections treated</td>
<td>9%</td>
<td>IQR 3 – 15%</td>
</tr>
</tbody>
</table>

## Risk of HCV infection in relation to sharing injection equipment

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95% CI</th>
<th>PAR%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syringe sharing</td>
<td>1.91</td>
<td>1.5 – 2.5</td>
<td>25%</td>
</tr>
<tr>
<td>Drug cooker sharing</td>
<td>2.4</td>
<td>1.9 – 3.1</td>
<td>43%</td>
</tr>
<tr>
<td>Filtration cotton sharing</td>
<td>2.6</td>
<td>1.9 – 3.6</td>
<td>42%</td>
</tr>
<tr>
<td>Rinse water</td>
<td>2.0</td>
<td>1.5 – 2.6</td>
<td>31%</td>
</tr>
</tbody>
</table>

**PAR%** - Population Attributable Risk Percent, the proportion of HCV infections in the underlying PWID population that is attributable to each injection risk behavior

Pouget R et al., Addiction, 2013
Relation between seroprevalence and risk of HCV transmission via syringe sharing
Young and new injectors

- Outbreaks of HCV infection in young PWID in rural and suburban areas linked to prescription opioid misuse
  - POs aggressively marketed in the US, particularly in regions where there is a large manual labor workforce
- Austin, Indiana HIV outbreak > 95% of HIV-positives also had HCV infection
- Hazard, KY 38% of those injecting < 1 year HCV-positive
- HCV seroincidence in young PWID 30/100 PY San Francisco

Havens JR et al., AJPH 2013; Page K et al., CID 2013; personal communication J Duwve, Indiana State DOH, 2015.
Infection control strategies target the **Agent, Host and Environment**

**AGENT: HCV**
- Efficiently transmitted via parenteral exposure
- Survives on surfaces outside the body
- 75-80% of infections become chronic

**HOST: PWID**
- Decreased syringe sharing
- Equipment sharing persists
- 40-60% may be HCV-infectious

**ENVIRONMENT: SETTINGS**
- Injection settings
  - A high prevalence of infectious PWID
  - A range of contaminated equipment
- Poor access to harm reduction & health services for PWID in many regions of US

HCV prevention – key areas

- **Interventions to prevent syringe and equipment sharing**
  - Needle/syringe programs (NSP)
    - Evidence is inconsistent
      - Tacoma study 1995 showed NSP prevented HCV and HBV infection in PWID
      - Weak or no effect in more recent studies
    - NSP must include safe injection education, and cookers, cottons, etc
    - Large regions of the US where NSP is not available
  - Opiate substitution treatment (OST)
    - By reducing injection frequency, OST can reduce unsafe injections and prevent HCV (and HIV)
    - Modest effect by itself
    - Also large regions of the US where OST not available

- **When NSP and OST are combined, they can prevent 75-80% of HCV infections**

Hagan H et al., JID 2011
HCV prevention – key areas

• Injection partners
  • Female injectors have higher rates of HCV seroconversion
  • Female injectors are more likely to share injection equipment and to be injected by other PWID
  • Both men and women who report injecting with a sex partner have high rates of HCV seroconversion

• Increased HCV screening and disclosure of RNA positive results could reduce HCV transmission
  • Altruistic behavior on the part of HIV-positive injectors in NYC helped turn the corner on the HIV epidemic

HCV prevention – key areas

• New HCV treatments may cure more than 85% of patients
  • They are well-tolerated and safe, and treatment is only 8-24 weeks
  • New treatments are expensive, but studies have shown that they are cost-effective

• However, currently fewer than 5% of PWID with chronic HCV infection are treated in the US each year

• A number of state Medicaid plans will only pay for treatment for patients with advanced fibrosis
Time to fibrosis in PWID

- Systematic review and meta-analysis of 21 studies of HCV disease progression in PWID
  - Estimated time from HCV infection to Metavir stages 1 – 4
  - State Medicaid programs – advanced fibrosis is F3 or F4 (cirrhosis)

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
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<tbody>
<tr>
<td>Time to F3</td>
<td>26 years</td>
</tr>
<tr>
<td>Time to cirrhosis</td>
<td>34 years</td>
</tr>
</tbody>
</table>

Smith D et al., IJDP 2015.
HCV prevention – key areas

• Curing HCV infection in PWID will help prevent new HCV infections
  • It will reduce the number of infectious carriers
  • With fewer carriers, syringe access and OST programs will be more effective

• However, **HCV treatment alone** will not control HCV infection in PWID
  • Large reductions in HCV prevalence over ten years can be achieved with OST, high-coverage NSP and HCV treatment

Martin N et al., CID 2013.
Model HCV prevention package for PWID

**Prevent new infections**
- Access to syringes & other equipment
- OST
- Safe injection education
- Outreach to those not engaged
- Prevent transition to injection

**Detect and care for existing infections**
- Antibody screening
- RNA test to confirm infection
- Clinical evaluation to determine disease stage
- Monitoring disease progression
- Reduce alcohol use

**Reduce chronic infections**
- Treat to cure infection
- Support adherence to treatment
- Support post-cure to prevent reinfection

Co-locating these services increases their impact on HCV control
HCV IN HIV+ MSM
Sexually transmitted HCV in HIV+MSM

• Since 2000, multiple reports of sexually-transmitted HCV in HIV+MSM
• Systematic review and meta-analysis of 17 cohort studies
  • 13,000 HIV+MSM followed to observe infection (all never injected)
  • 0.5/100PY (5/1000PY)
  • Most of the new infections were attributable to high-risk sex behaviors that involved trauma and bleeding, and to use of methamphetamines and other stimulants
• Rates of reinfection post-SVR were high, at 11/100PY
  • Points to a high-risk subset of HIV+MSM
  • Recurring exposure to HCV
  • Factors associated with transmission were rarely reported in those that did not seroconvert
• Current approaches to HCV in this population center on frequent screening and offering treatment

Hagan H et al., AIDS 2015.
PrEP and HCV

• Several reports of sexually-transmitted HCV infection in HIV-negative MSM on PrEP
• PrEP has been suggested for PWID in communities where harm reduction is illegal or there is political opposition
• Raises the possibility of PrEP-related HCV infection in both MSM and PWID

Hagan H et al., AIDS 2015;
Evidence-based interventions to prevent transition to drug injection
Low threshold substance use treatment for PWID and non-injecting drug users

• What is low-threshold treatment?
  • For clients who do not have abstinence as a treatment goal
  • Reduces barriers to treatment admission and retention
    • Abstinence is not required for entry or continued treatment

• Can interrupt progression of drug dependence
  • Prevent non-injecting drug users from beginning to inject
  • For new injectors, may prevent consolidation of injecting as a regular mode of administration

• Outcomes of low-threshold treatment:
  • Stabilizes opiate dependence, reduces heroin use
  • Provides regular contact with health care providers
  • Reduces HIV risk behavior, mortality, and criminal behavior

“Change the Cycle”

- Peer-driven, one-session intervention
- Purpose to reduce initiation into injection
- Targets current injectors
- Supports them to avoid:
  - Speaking positively about injecting to non-injectors
  - Injecting in front of non-injectors
  - Showing non-injectors how to inject
  - Helping with first injection
- Results:
  - 72% reduction in initiation
  - More effective than interventions that target non-injectors

Summary of HCV prevention in PWID

- Must continue and expand effective harm reduction services
  - Increase access to sterile syringes and injection equipment (drug cookers, filtration cotton, rinse water)
  - OST (including active injectors) to reduce unsafe injections
- HCV treatment is highly effective and if a large proportion of PWID are cured, the prevalence of infectious carriers will decline
  - Treatment alone will not control HCV
  - To be effective, PWID need support to complete the HCV care cascade
- Challenges remain, but there is compelling evidence showing that we can prevent HCV infection in PWID
Resources on HCV prevention

• New York University Center for Drug Use and HIV Research HCV brief:

• Harm Reduction Coalition information on HCV prevention
  • http://harmreduction.org/syringe-access/syringe-access-tools/seps-and-hepatitis-c/

• The HCV Advocate
  • http://www.hcvadvocate.org/hepatitis/factsheets_pdf/Harm_Reduction_Overview.pdf

• National Viral Hepatitis Roundtable
  • http://nvhr.org/content/navigating-hepatitis-c-what-patients-need-know-0
  • http://nvhr.org/content/new-report-hcv-treatment-access-restrictions