CHRONIC HEPATITIS C ERADICATION MODEL THROUGH PRIMARY CARE: TREATING HCV IN PRISONS AND THE COMMUNITY CONTINUUM of care

Disclosures

• Dr. John Farley has received research grants and honoraria from Gilead Sciences Canada, Roche Canada, Abvie Canada and Merck Canada

Farley J†, Jabar A†, Farley J-R†, Hakobyan V†
†Dr John Farley Inc, Vancouver, BC, Canada
National Incarceration System:

- **Provincial / Territorial:**
  - Sentences < 2 years
  - Offenders sentenced to probation
  - Young offenders
- **Federal:** (Correctional Service Canada)
  - Sentences > 2 years
  - 53 penitentiaries (5 for women only)
  - 17 community correctional centres (day parole, conditional release)
  - 175 community-based residential facilities (half-way houses)

Incarcerated Population:

- **1999/00:**
  - Total average combined incarcerated population (FPT) 31,600
  - 285,000 convictions (adults):
    - 2/3 no term sentence
    - 1/3 term sentence – 5% of which are Federal (> 2 yrs)
- **2001:**
  - Federal population: 14,984 (average)
    - 97% men
    - 15% aboriginal
  - Approximately 7000 new admissions per year

(PWGSC, 2001)
Rate of Incarceration:
Canada
118/100,000 population
(1999/00)
(PWGSC, 2001)
Legislation

- **THE CORRECTIONAL SERVICE OF CANADA**
  Corrections and Conditional Release Act
  Section 86 – Inmate Health

- The Service shall provide every inmate with
  (a) essential health care; and
  (b) reasonable access to non-essential mental health care that will contribute to the inmate’s rehabilitation and successful reintegration into the community.

- The provision of health care under subsection (1) shall conform to professionally accepted standards.

- Services provided by CSC Health Services Branch
• Screening for HCV/ HIV/ HBV etc offered to inmates at intake (and any time after)

• Inmates may request evaluation for treatment

Infectious Diseases Program (continued)

• Based on surveillance system (2001, in general inmate population)
  • HIV:
    – 223 cases (1.8%)
    – ~50% on HAART
  • HCV:
    – 2993 cases (23.6%)
    – Rates of reported infection Much higher in women (41.2% vs 23.2%)
      – Treatment largely non existent: Logistical nightmare - Sent to community specialists
  • HBV: 43 new cases (0.3%)
  • STI: poor testing uptake (CSC, 2003)
HCV Epidemiology: Canada

• Prevalence\(^1\)
  – .8% anti HCV positive

• Incidence\(^3\)
  – 8,000 new cases per year
  – 2,000 of these recognized as acute

3. Health Canada - About Hepatitis C. 2003 05 01
HCV Treatment in Institutions

• Organized
  – Nurse – centered program including mentorship
  – Protocols for treatment
  – Contracted Liver Biopsies to local Radiology Clinic
  – Advocated for and Started HCV Treatment in institutions (with Interferon/ Ribavirin- based regimens
  – Set up electronic database

Review based on database

• Retrospective review (Nov 2000- February 2004)
• 558 inmates of which 454 were anti-HCV+
• 233 inmates on treatment
• Of the 233 inmates on treatment,
  – 114 were on Rebetron®
  – 118 were on Pegetron®
  – 1 was on Pegasys®

This publication focuses on the 114 inmates on Pegylated Interferon & Ribavirin combination
Hepatitis C treatment in a Canadian federal correctional population: Preliminary feasibility and outcomes

Author(s): John Farley (Dr. John Farley Inc., Vancouver and Department of Health Care and Epidemiology, The University of British Columbia, Vancouver, BC, Canada)

Abstract: Hepatitis C virus (HCV) infection is a major public health concern in Canada, which now mostly affects marginalized populations, including correctional inmates. These populations—until recently—have largely been excluded from HCV pharmacotherapy. We report preliminary data on HCV treatment in a federal correctional population sample in British Columbia (BC), using Peginteron combination therapy. HCV RNA results are presented at week 12 of treatment, a strong predictor of treatment outcomes. Just over four-fifths (80.8%) of inmate patients had no detectable HCV RNA at week 12. Inmates with genotype 2 and 3 fared better than those with genotype 1. These preliminary results suggest that HCV treatment is feasible and promises to be efficacious in correctional populations.

Keywords: HCV, Treatment, Canadian correctional populations

Type: General review
Publisher: Emerald Group Publishing Limited
Copyright: © Emerald Group Publishing Limited 2005
Published by Emerald Group Publishing Limited

Download: The full text of this document has been downloaded 70 times since 2013

Feasibility and Outcome of HCV Treatment in a Canadian Federal Prison Population

We assessed feasibility and outcome of hepatitis C Virus (HCV) treatment in male correctional inmates in British Columbia, Canada. We reviewed the medical charts of 114 treated inmates; 80 had complete data for treatment outcome. Approximately 4 of 5 inmates completed treatment (78.8%); 66.3% achieved sustained virological response. Those who completed treatment, those with injection drug use as a risk factor, and those with genotypes 2 and 3 were significantly more likely to achieve sustained virological response. HCV treatment in correctional inmates is feasible and effective.
HCV RNA+ Inmates treated with Rebetron®: Treatment Outcome

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>By Genotype</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SVR</td>
<td>52/80</td>
<td>65%</td>
<td>17/36</td>
<td>45%</td>
<td>12/12</td>
<td>100%</td>
</tr>
<tr>
<td>Failure</td>
<td>28/80</td>
<td>35%</td>
<td>21/36</td>
<td>55%</td>
<td>0/12</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>80/80</td>
<td>100%</td>
<td>38/36</td>
<td>100%</td>
<td>12/12</td>
<td>100%</td>
</tr>
</tbody>
</table>

Conclusions: Available Evidence (Proof of concept)

- Canadian federal correctional settings offer a very important opportunity to reach a marginalized (motivated) population.
- Effective treatment and adherence to a complex regimen can be satisfactorily achieved.
- Every effort should be made to use this opportunity for an important public health intervention.
- A team comprising of a specialist and nurses can be very cost effective in delivering treatment and care to those with chronic Hep C.
Barriers to Treating Hepatitis C in Canadian prison populations

• The major barrier for initiating the HCV and HIV treatment in correctional facility: capability for continuing the treatment and follow up on discharge to the community.
Why InCoHRS?

- Transition for prisoners from custody to community often chaotic and difficult.
- Health-care concerns often take a lower priority than the search for jobs and housing, rebuilding personal relationships, and other chores.
- InCoHRS provides an accessible health-care service for prisoners during transition from custody to community.

What are InCoHRS services?

Post-Release Services

- Health services including education
- Counseling and group support
- Assist in applying for support services (eg welfare)
- Health clinics and methadone clinics
- Communicate with family members on support issue
- Referral to other services (HIV/AIDS, mental health, transition houses, outreach workers, employment)
- Assistance with ensuring that medications available on release eg NAVIGATING THE HEALTH CARE / PHARMACARE SYSTEM MAZE
Importance of INCOHRS

- A link between CSC and community to assist in their reestablishment in the community

INCOHRS services

- As of March 31, 2007,
  - 373 CSC Inmates received services
Continued

3 years
(Interferon alfa and Ribavirin) during
stage 4

21x106
25
30
35
22x97
10
22x132
15
22x167
20
22x201
25
22x236
30
26x56
0
44x17
2005 Oct
110
2005 Nov
0.5-1 year
2006 Jan
113x15
2006 Feb
2006 Mar
2006 Apr
2006 May
2006 Jun
2006 Jul
2006 Aug
2006 Sep
2006 Oct
2006 Nov
2006 Dec
11

Number of inmates who access InCoHRS services monthly

We followed up inmates in the prison as well as after release into community for a
3. Results
According the data of the Canadian HIV/AIDS Legal Network, the prevalence of

HCV in correctional institutions is estimated at

1. Patients were initially infected with HCV and were treated; (b) they were treated with

Pegetron
–
2009
–
2009, (N=154).

15 %
26
2006 Sep
2006 Oct
2006 Nov
2006 Dec
2007 Jan
2007 Feb
2007 Mar
2007 Apr
2007 May
2007 Jun
2007 Jul
2007 Aug
2007 Sep
2007 Oct
2007 Nov
2007 Dec

A HCV reinfecion was defined to be a new infection that occurs after a previous
infection was estimated at the halfway

When reinfection occurred after the recommended 24 weeks for checking SVR
47.9
118.9
18.5

During follow up period of 4 years total 34 re-infection cases were identified, those
who became re-infected.
Differences in HCV Treatment Outcomes Between Prison and Community Populations: 8 year follow-up

**BACKGROUND**

The estimated 3.5 million people are infected with HCV in Canada. HCV is mainly transmitted through intravenous drug use (IVDU), but can also be transmitted by other routes, including sexual contact.

In 2007, Correctional Services of Canada (CSC) reported that 5% of CSC inmates had HCV infections, but 27% of CSC inmates had HCV antibody tests. Inmates are at greater risk for HCV infection due to higher rates of drug use and engaging in sexual contact.

**OBJECTIVE**

To evaluate the differences in HCV treatment outcomes between inmates and individuals in the community.

**METHODS**

- The study included retrospective chart reviews of HCV prevalence in the British Columbia prison population. The study included 385 inmates.
- HCV prevalence was determined at inmates: B.C. Canadian Collection Centre for Disease Control (SCDC) – University of British Columbia (UBC) – Correctional Service of Canada (CSC).
- The study compared HCV treatment outcomes between inmates and incarcerated individuals in the community.
- The study was funded by the Canadian Institutes of Health Research (CIHR) – Canada Research Chair in Primary Care.

**RESULTS**

<table>
<thead>
<tr>
<th>Table 1: Baseline Characteristics</th>
<th>Community(N=286)</th>
<th>CSC(N=385)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>168 (59.0%)</td>
<td>332 (86.1%)</td>
</tr>
<tr>
<td>Female</td>
<td>118 (41.0%)</td>
<td>53 (13.9%)</td>
<td></td>
</tr>
<tr>
<td>Mean Age (years)</td>
<td>47.1 (12.0)</td>
<td>52.6 (11.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Race</td>
<td>Caucasian</td>
<td>194 (68.0%)</td>
<td>320 (83.0%)</td>
</tr>
<tr>
<td></td>
<td>Aboriginal</td>
<td>92 (32.0%)</td>
<td>65 (17.0%)</td>
</tr>
<tr>
<td>Mean CD4 (cells/mm³)</td>
<td>553.0 (520.0)</td>
<td>558.0 (520.0)</td>
<td>0.781</td>
</tr>
<tr>
<td>Mean BMI</td>
<td>26.9 (4.3)</td>
<td>26.9 (4.3)</td>
<td>0.996</td>
</tr>
<tr>
<td>HIV status</td>
<td>UNV</td>
<td>239 (62.1%)</td>
<td>276 (71.4%)</td>
</tr>
<tr>
<td></td>
<td>VIN</td>
<td>52 (14.2%)</td>
<td>9 (2.3%)</td>
</tr>
<tr>
<td></td>
<td>VUN</td>
<td>94 (26.6%)</td>
<td>60 (15.5%)</td>
</tr>
<tr>
<td>Virologic follow-up</td>
<td>12 (0.0%)</td>
<td>12 (0.0%)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2: HCV Associated Risk Factors</th>
<th>Community(N=286)</th>
<th>CSC(N=385)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injection Drug Use</td>
<td>Yes</td>
<td>186 (65.1%)</td>
<td>327 (85.0%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>100 (34.9%)</td>
<td>58 (15.0%)</td>
</tr>
<tr>
<td>Prison for &gt; 1 year</td>
<td>Yes</td>
<td>168 (59.0%)</td>
<td>312 (80.7%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>118 (41.0%)</td>
<td>73 (19.3%)</td>
</tr>
<tr>
<td>History of Transfusion</td>
<td>Yes</td>
<td>11 (3.8%)</td>
<td>20 (5.2%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>275 (96.2%)</td>
<td>365 (94.8%)</td>
</tr>
<tr>
<td>Prior number of Tx</td>
<td>1</td>
<td>109 (38.0%)</td>
<td>226 (58.6%)</td>
</tr>
<tr>
<td></td>
<td>≥2</td>
<td>177 (62.0%)</td>
<td>159 (41.4%)</td>
</tr>
<tr>
<td>Pegylated Dose</td>
<td>Yes</td>
<td>57 (19.9%)</td>
<td>106 (27.4%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>229 (80.1%)</td>
<td>379 (97.6%)</td>
</tr>
<tr>
<td>Baseline HCV Viral Load</td>
<td>&lt;600,000 copies/ml</td>
<td>192 (67.0%)</td>
<td>286 (74.4%)</td>
</tr>
<tr>
<td></td>
<td>≥600,000 copies/ml</td>
<td>94 (33.0%)</td>
<td>100 (25.6%)</td>
</tr>
</tbody>
</table>

**CONCLUSIONS**

Inmates had higher SVR and lower relapse rates possible due to more availability and treatment of HCV infections.

**RESULTS**

<table>
<thead>
<tr>
<th>Table 3: Treatment Outcome</th>
<th>Community(N=286)</th>
<th>CSC(N=385)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVR</td>
<td>Yes</td>
<td>177 (62.1%)</td>
<td>280 (72.8%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>109 (37.9%)</td>
<td>105 (27.2%)</td>
</tr>
<tr>
<td>Relapse</td>
<td>Yes</td>
<td>23 (8.1%)</td>
<td>16 (4.2%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>263 (91.9%)</td>
<td>369 (95.8%)</td>
</tr>
<tr>
<td>Partial Response</td>
<td>Yes</td>
<td>4 (1.4%)</td>
<td>4 (1.0%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>282 (98.6%)</td>
<td>381 (99.0%)</td>
</tr>
<tr>
<td>Null Response</td>
<td>Yes</td>
<td>4 (1.4%)</td>
<td>4 (1.0%)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>282 (98.6%)</td>
<td>381 (99.0%)</td>
</tr>
</tbody>
</table>

**CONCLUSIONS**

Inmates had higher SVR and lower relapse rates compared to the community population.

To conclude, HCV re-infection rate was higher among inmates population, possibly due to the higher rate of IVDU after HCV therapy.

More harm reduction programs, follow up programs after release and community engagement programs are needed to make current HCV treatment programs in correctional institutions more effective.

“Dr Farley is My Family Doctor”

About 20% of Main street Vancouver clinic: Inmates (& Former Inmates) Getting Primary care – A challenge
Eight Federal Canadian prisons and two community-based clinics in Vancouver.

439 HCV-infected patients treated with DAAs in 10 centers by a healthcare team under the supervision of one infectious diseases specialist from March 2015 to December 2017.

Most were treated for 12 weeks;

seen by the nurses on average 4-5 times and by the specialist 2 times during treatment course.

Post-treatment HCV RNA determination was available for 389 cases;

SVR (12 week post): achieved 381 (98%).
Conclusion

- Our HCV care model demonstrated that treatment in multiple centers can be successfully achieved by trained primary healthcare professionals with input from specialists.

- This model of HCV treatment can be adopted in diverse settings and can address most cases (~90%).

- This will reduce wait times for HCV treatment and reduce specialist service strain.

- It will contribute to the goal of elimination of HCV while helping address the epidemic.

- THANK YOU
THANK YOU 😊
### InCoHRS Summary (Jun – Dec 2004)

<table>
<thead>
<tr>
<th>Month</th>
<th>#Referred to InCoHRS</th>
<th>#On Tx</th>
<th>#Referred (by InCoHRS) to G.P</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>9</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>July</td>
<td>15</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>August</td>
<td>15</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>September</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>October</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>November</td>
<td>7</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>December</td>
<td>10</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>67</strong></td>
<td><strong>29</strong></td>
<td><strong>34</strong></td>
</tr>
</tbody>
</table>

### Figures

**Figure 1**: Ethnic composition of prison inmates assessed for treatment.

**Figure 2**: Distribution of inmates at different fibrosis stages.

**Figure 3**: Distribution of risk factors for HCV infection.

**Figure 4**: Rates of End of treatment and SVR.

**Figure 5**: Rates of treatment delay.

### CLINICAL AND EPIDEMIOLOGICAL FEATURES OF CHRONIC HEPATITIS C IN CANADIAN PRISONERS: FIVE YEAR FOLLOW-UP

<table>
<thead>
<tr>
<th>Month</th>
<th>#Referred to InCoHRS</th>
<th>#On Tx</th>
<th>#Referred (by InCoHRS) to G.P</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>9</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>July</td>
<td>15</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>August</td>
<td>15</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>September</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>October</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>November</td>
<td>7</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>December</td>
<td>10</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>67</strong></td>
<td><strong>29</strong></td>
<td><strong>34</strong></td>
</tr>
</tbody>
</table>

### RESULTS

1. **Clinical and Epidemiological Features of Chronic Hepatitis C in Canadian Prisoners: Five Year Follow-Up**

   - Among other risk factors, 208 (53%) of inmates admitted using excessive amounts of alcohol.
   - Among those who had answered the question about the initiation place (148 patients), 123 (83%) initiated the IDU in a community and 17% in a prison environment.

2. **Methodology**

   - The study was conducted in InCoHRS, a national network of community-based programs for the treatment of HCV in prisoners.

3. **Results**

   - Of those who had answered question about treatment delay, the major reasons for treatment delay were: ongoing IDU, 39% (15% for 5 years, in 25% for 10 years, in 6% for 11 years).
   - The adherence rate in inmate population in Canada was estimated to be 3% overall, with 71% of patients not ready and comorbidities (60%), not aware of treatment.

4. **Conclusions**

   - The treatment was delayed for an average of 2 years, with 15% of patients becoming reinfected after successful treatment.
   - Of the 297 remaining patients, 171 (57.5%) had successful EOT (recommended end of treatment).
   - Of those who had an information about the circumstances of HCV diagnosis, 41% of the patients were diagnosed with HCV in institution, 41% in community.
   - Among those who had answered question about treatment delay, the major reasons for treatment delay included ongoing IDU, 39% (15% for 5 years, in 25% for 10 years, in 6% for 11 years).
   - The adherence rate in inmate population in Canada was estimated to be 3% overall, with 71% of patients not ready and comorbidities (60%), not aware of treatment.

5. **Implications**

   - It is estimated that the treatment was delayed for an average of 2 years, with 15% of patients becoming reinfected after successful treatment.
INMATE COMMUNITY HEALTH REINTEGRATION SERVICES (InCoHRS)
Chronic Hepatitis C Eradication Model Through Primary Care in British Columbia, Canada

Authors:
Farley J1, Jabar A1, Farley J-R1, Hakobyan V1
1Dr John Farley Inc, Vancouver, BC, Canada
Offenders under the responsibility of Correctional Service of Canada