The Changing World of Hepatitis C

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## Disclosures

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<tr>
<td>Abbvie</td>
<td>Investigator, consultant</td>
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Objectives

- Epidemiology and natural history
- Burden of disease in Canada
- Screening
- Treatment options & Outcomes
- Fibrosis evaluation
Estimated 170 Million Persons With HCV Infection Worldwide

- 3-4 million newly infected each yr worldwide

Prevalence of infection:
- > 10%
- 1%-2.50%
- 2.5%-10%
- NA

HCV Infection: Worldwide Genotype Distribution
Age and gender distribution of anti-HCV positive cases in Canada (2011).

Total number of viremic HCV cases (with uncertainty intervals) by year (1950-2035).

Proportion of all viremic HCV cases according to disease stage (1950-2035).

Burden of Hepatitis C: The Future Toll of Illness

Hepatitis C - The Ticking Time Bomb

By 2035, the most common health complications associated with chronic hepatitis C will increase by:

- 89% Compensated Cirrhosis
- 80% Decompensated Cirrhosis
- 160% Liver-related deaths
- 205% Liver Cancer

The number of Canadians with chronic hepatitis C with cirrhosis and more advanced liver disease is on the rise.

75% of hepatitis C patients have early-stage disease at any given time - an ideal opportunity to intervene with new antiviral therapy to avoid the future toll.

Source:
Burden of Disease and Cost of Chronic Hepatitis C Virus Infection in Canada, Canadian Journal of Gastroenterology and Hepatology (May, 2014)

Canadian Liver Foundation
Fondation Canadienne du Foie
Burden of Hepatitis C

The Future Costs of Not Treating

Health care costs will increase by 60% due to complications of advanced hepatitis C (not including antiviral therapy, virology testing and indirect medical costs).

$161.4M
2013

$258.4M
2032

In 2032, 81% of the total health care costs of hepatitis C will be attributable to more advanced liver disease, up from 56% in 2013.

Based on 2013 health care costs, it is estimated that a male, 35 to 39 years of age, will incur a future lifetime cost between $51,946 to $327,608, to treat his chronic hepatitis C infection.

$51,946
With no Fibrosis

$62,184
Fibrosis (stage 1)

$79,926
Fibrosis (stage 2)

$100,589
Fibrosis (stage 3)

$133,575
Compensated Cirrhosis (F4)

$188,117
 Decompensated Cirrhosis

$327,608
Requiring Liver Transplant

Source: Burden of Disease and Cost of Chronic Hepatitis C Virus Infection in Canada, Canadian Journal of Gastroenterology and Hepatology (May, 2014)
Importance of Screening and Treating HCV

HCV-related mortality exceeds mortality from HCV\(^1\)

Other modes of transmission include sexual, occupational, nosocomial and vertical transmission. 

*IDU: injection drug use.


HCV Prevalence According to Exposure

- IDU: 58%
- Current IDU: 38%
- Previous IDU: 62%
- Other*: 11%
- Immigration: 20%
- Transfusion: 11%
- Hemophilia: 0.4%
CDC Recommendations
(August 2012)

Screening of those born between 1945-1965\(^1,2\)

*** In Canada: CLF suggests 1945-1975

→ One-time testing during a yearly checkup or as a part of insurance blood work

In the US, >75% of adults with chronic hepatitis C are baby boomers

• 73.4% of HCV-related deaths were in persons 45-64 years of age

CDC: Centers for Disease Control and Prevention
What about patients with advanced disease?

Long-term follow-up of patients with F3/F4 post-treatment

SVR eliminates liver failure & liver-related death

Van de Meer et al JAMA 2012
The Advancing Present

Adapted from the US Food and Drug Administration, Antiviral Drugs Advisory Committee Meeting, April 27-28, 2011, Silver Spring, MD.
HCV Lifecycle and DAA Targets

- Receptor binding and endocytosis
- Fusion and uncoating
- (+) RNA
- Translation and polyprotein processing
- RNA replication
- Membranous web
- Transport and release
- ER lumen
- LD
- NS3/4 protease inhibitors
- NS5B polymerase inhibitors
- NS5A* inhibitors

*Role in HCV lifecycle not well defined

The Present: SVR Rates With Boceprevir or Telaprevir in Genotype 1 Treatment-Naive Patients
Triple Therapy for up to 48 Weeks

“It relieves watery eyes, runny nose, aching head, and scratchy throat. Side effects include runny eyes, watery nose, aching throat, and scratchy head.”
2014 /2015 : Virologic Response to PEG-INF + RBV + Simeprevir or Sofosbuvir in Genotype 1 Treatment-Naive Patients

2014/2015: Virologic Response to PEG-INF + RBV vs. Sofosbuvir + RBV (all-oral) in Genotype 2 and 3 Treatment-Naive Patients

- **PegIFN/RBV X 24 wks**: 70-80%
- **Geno 2 SOF+RBV X 12 wks**: 97%
- **Geno 3 SOF+RBV X 24 wks**: 92-94%


2015/2016: Virologic Response to Non-interferon-based therapy: Genotype 1: Treatment-Naive Patients:
Non-cirrhotic and cirrhotic sub-groups

Fibrosis is the key
**Absence de risque pour le patient**

1. L'examen est totalement non-invasif.
2. L'examen est parfaitement indolore.
3. Il n'y a aucun effet secondaire.

**Meilleure prise en charge thérapeutique**

1. Le diagnostic peut être élargi aux sujets à risque pour lesquels la biopsie n'est pas prescrite comme les hémophiles, ou aux patients qui la refusent comme les toxicomanes ou les alcoolodépendants.
2. Le suivi est renforcé : l'examen, dont le résultat est instantané, peut être réalisé autant de fois que nécessaire.
3. Le diagnostic n'est pas perturbé par un traitement ou par une pathologie associée.

**Santé publique**

**Prévention accrue et réduction des dépenses**

1. Des campagnes de dépistage de la cirrhose dans la population générale sont désormais possibles.
2. Le coût de l'examen est très faible :
   - pas de consommable,
   - pas d'hospitalisation,
   - pas d'infrastructure dédiée.
Hepatitis C: Summary

• HCV is common

• Screening for HCV is imperative
  – ‘baby-boomers’ and immigrants

• Viral eradication / cure in 70-90%

• Viral eradication has a mortality benefit