HCV Epidemiology Screening and Natural History

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Hepatitis C In The US

5.1 million estimated true prevalence
3.9 million CDC estimate
25% Diagnosed

Incarcerated, Homeless, Nursing Homes, Hospitalized, Active Military

Chak E, et al. Liv Int 2011;31:1090-1101
Natural History of HCV

- Acute Infection*
  - Chronic Infection: 75%-85%
- Cirrhosis: 10%-20% over 20 years
- Decompensated Cirrhosis: 5-yr survival rate 50%
- HCC: 1%-4% per year
- Most Americans infected >35y
- Additional impact of: Alcohol, Obesity, Older age

Consequences of Under-Diagnosis

33% undiagnosed Americans have advanced fibrosis/cirrhosis

HCV is a Systemic Disease

- Acute Infection* 75%-85%
- Chronic Infection 10%-20% over 20 years
- Cirrhosis 1%-4% per year
- HCC 5-yr survival rate 50%

Extrahepatic Manifestations of HCV

**Strongly associated**
- Mixed cryoglobulinemia
- Sjögren (sicca) syndrome
- Lymphoproliferative disorders
- Porphyria cutanea tarda
- Neuropathy
- Membranoproliferative glomerulonephritis
- Cryoglobulinemic vasculitis

**Possibly associated**
- Corneal ulcers (Mooren ulcers)
- Thyroid disease
- Lichen planus
- Pulmonary fibrosis
- Type 2 diabetes
- Systemic vasculitis (polyarteritis nodosa, microscopic polyangiitis)
- Arthralgias, myalgias, inflammatory polyarthritis
- Autoimmune thrombocytopenia

HCV Infection Increases Risk of Chronic Kidney Disease – REVEAL-HCV Study

N=23,785; 1,313 seropositive for HCV

Lai TS, et al. AASLD 2014, Abstract #172

HCV Infection is Associated with Increased All Cause Mortality “Reveal-C”

We Can Make A Difference!


SVR Improves Long-Term Liver Outcomes

Outcome After SVR in Advanced Fibrosis (HALT-C)

NR = non response; BT/R= Breakthrough/relapse;  SVR = Sustained response

SVR Normalizes Life Expectancy Even in Advanced Fibrosis (F3-4)

530 patients, median follow-up 8.4 years.


Hepatitis C In The US is Underdiagnosed

5.1 million estimated true prevalence

25% Diagnosed

Chak E, et al. Liv Int 2011;31:1090-1101
1998 CDC Risk Based HCV Screening Recommendations

- Ever injected illegal drugs
- Received blood, organs, or clotting factors prior to 1992
- Have ever been on hemodialysis
- Have elevated ALT
- Born to HCV infected mothers
- Have HIV infection
- Percutaneous or mucosal exposure to HCV positive blood


Never Worked!
Risk-Based Screening Does Not Work

- Primary care setting, US – 2005-2010
- 17,464 tested for HCV
  - 6.4% positive
- Odds ratios for positive anti-HCV
  - IVDU: 6.3
  - 1945-1965 birth cohort: 4.4
  - Elevated ALT: 4.8
- Risk based screening missed 4 out of 5 HCV positive adults

Yartel AK, et al. AASLD 2013; abstract #24

HCV in the US – 2001-2010

Milliman Study: Based on NHANES and Claim Forms

82% aged 44-63 years

HCV in the U.S.

8,810 Americans with hepatitis C infection
Danville PA, Detroit MI, Portland OR, Honolulu HI

Moorman AC, et al. CID 2013;56:40-50

Distribution by Birth Year

Moorman AC, et al. CID 2013;56:40-50

ACG's Hepatitis School - Las Vegas, NV
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Baby Boomer Epidemic

Anti-HCV Prevalence by Birth Year, NHANES 1999-2008

1945-1965: 3.6%
Others: 0.8%

Smith BD, et al. AASLD 2011, abstract 241

Birth Year 1945 – 1965
Baby Boomers
Birth Year 1945 – 1965
Baby Boomers

Woodstock Festival 1969
“Share Love and Hep C”
Not Only the Boomer’s Fault...

- Hepatitis C was not in the radar
- Blood supply was contaminated
- No universal precautions in healthcare settings
- No way to screen organs or blood products

2012 CDC Recommendations for Birth Cohort Screening (1945-1965)

**Recommendation #1**
- Adults born from 1945-1965 should receive one-time testing for HCV.

**Recommendation #2**
- HCV (+) individuals
  - Brief alcohol screening and intervention
  - Referral to appropriate care for HCV

2013 USPSTF HCV Screening Recommendations

1. Those at high risk for HCV infection
2. Those born from 1945 to 1965
   ◦ Grade B recommendation – high certainty that the net benefit is moderate to substantial

The Affordable Care Act
   ◦ Requires insurance plans to provide Grade A or B recommendations without cost sharing

USPSTF = United States Preventive Services Task Force

Moyer VA - on behalf of the USPSTF. Ann Intern Med 2013;159:349-357

Baby Boomers in the VA Population

VA Screening program; 5.5 million eligible for screen

<table>
<thead>
<tr>
<th>Birth Year</th>
<th>% screened</th>
<th>Anti-HCV (+)</th>
<th>HCV-RNA (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1945</td>
<td>42%</td>
<td>2.9%</td>
<td>1.7%</td>
</tr>
<tr>
<td>1945-1965</td>
<td>64%</td>
<td>13.1%</td>
<td>9.9%</td>
</tr>
<tr>
<td>&gt;1965</td>
<td>58%</td>
<td>1.9%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Backus L, et al. AASLD 2013; Abstract #21
Is it Effective?
3 Randomized Controlled Trials

Compared to “standard of care”

- Testing for HCV in persons born 1945-1965 with no prior testing
- Was 5 times more effective in identifying persons with current or prior infection

Smith BD, et al. AASLD 2014, Abstract #194

For “Non-Baby Boomers”

Risk based screening

- IVDU – single or multiple
- Intranasal cocaine use
- Getting an unregulated tattoo and other percutaneous exposures
- Blood transfusion before 1992
- Born to an HCV-infected mother
- Incarceration

Moyer VA - on behalf of the USPSTF. Ann Intern Med 2013;159:349-357
HCV Is Not Going Away!

Reported number of acute hepatitis C cases — United States, 2000–2012

Source: National Notifiable Diseases Surveillance System (NNDSS)

Year
0.0
0.5
1.0
1.5
2.0
2.5
3.0

Reported cases/100,000 population

Source: National Notifiable Diseases Surveillance System (NNDSS)

Not All anti HCV (+) Patients are Infected!

Acute Infection*  
Chronic Infection 75%-85%  
Cirrhosis 10%-20% over 20 years  
Clearance of HCV RNA 15%-25%  

HCC 1%-4% per year  
Decompensated Cirrhosis 5-yr survival rate 50%
Importance of Confirming Viremia

- Anti-HCV Antibody Positive → HCV RNA Positive → HCV Genotype
- Consider Liver Biopsy
- Vaccinate for HAV / HBV*

Benefits of Diagnosis

**PREVENT TRANSMISSION**
- Avoid sharing objects with blood
- Stop illicit drugs or sharing needles
- Discuss risk of sexual transmission with “unsafe sex”

**OTHER RECOMMENDATIONS**
- Avoid alcohol consumption
- Discuss available treatments
- Vaccinate for hepatitis A and B
- Test for HBV, HIV
- Consider family member screening
Why on Earth would I want to find MORE hepatitis C patients?!?!?

- Different “clientele”
- Treatments are easier to use and tolerate
- Benefits of therapy far exceed ignoring the disease
- HCV patients also need colon cancer screening (and get heartburn...)

HCV Epidemiology Screening and Natural History - Summary

1. Most HCV patients remain undiagnosed
2. 75% of them were born from 1945-1965
3. 33% of them have advanced fibrosis
   - “ticking time bombs” waiting to explode (bleed) on a Friday at midnight when you are on call
4. Therapy is more effective and safer
5. It’s time to incorporate screening into your practice!