Hepatitis C: Let’s Talk About It

Causes of Hepatitis

any swelling, inflammation, or irritation of the liver

- Autoimmune disease
- Alcohol
- Toxins
- Fatty liver
- Virus(es)
Hepatitis C

Acute Hepatitis

- “Acute” denotes length of infection, not severity
- New onset of infection
- Symptomatic vs asymptomatic
- Adequate immune response to virus
- Generally resolves within 6 months

Symptoms of Acute Infection

- Nausea, vomiting
- Abdominal pain
- Loss of appetite
- Fever
- Diarrhea
- Clay-colored stools
- Joint pain
- Jaundice
- Dark urine
Chronic Hepatitis

- Inadequate immune response
- Infection is life-long
- May/may not have symptoms
- Most unaware of their infection
- End stage liver disease, liver cancer
- Treatment available

Hepatitis C (HCV)

- RNA virus: does not incorporate into host
- 10X more infectious than HIV
- Blood to blood transmission
- 55-85% develop chronic infection
- “Silent epidemic”

Source: CDC
Clinical Features

<table>
<thead>
<tr>
<th>Incubation period</th>
<th>Mean 4-12 weeks</th>
<th>Range 2-24 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute infection</td>
<td>Largely asymptomatic</td>
<td></td>
</tr>
<tr>
<td>Symptomatic</td>
<td>20-30 %</td>
<td></td>
</tr>
<tr>
<td>Resolution/no progression</td>
<td>15-25%</td>
<td></td>
</tr>
<tr>
<td>Chronic infection</td>
<td>75-85%</td>
<td></td>
</tr>
<tr>
<td>Disease progression</td>
<td>Gradual over 20-30 years</td>
<td></td>
</tr>
</tbody>
</table>

Source: CDC

Natural History of HCV Infection

100 Exposure (Acute phase) → 15 Resolved

85 Chronic → 17 Cirrhosis → 13 Slowly progressive

68 Stable → HCC Transplant Death

HIV and Alcohol

Source: CDC
Chronic HCV

- 1.6 % of US population
- 2-4 million in US
- 3-5 times more frequent than HIV
- 75% unaware of infection
- Now recognized as serious public health problem

Source: IOM Report, 2010
Hepatitis C

Baby Boomers (1946-1964)

- 1 in 33 infected with chronic HCV
- 75% unaware of infection
- CDC recommends one time testing for all Baby Boomers
- Born in 1950's = highest prevalence

Source: CDC

Sources of Infection

- IDU 60%
- Sexual 15%
- Transfusion 10% (before screening)
- Occupational 4%
- Other 1%*
- Unknown 10%

* Nosocomial; iatrogenic; perinatal

Source: CDC June 2008
Other possible routes

- Tattoos and piercing
- Personal care salons
- Shared household (hygiene) items
- Coke straws and crack pipes

Sexual Transmission

Risk is generally low, but increases in the presence of high risk sexual behaviors

To reduce risk
- Limit number of partners
- Use latex condoms
- Get vaccinated against hepatitis B
- Get vaccinated if at risk for hepatitis A (MSM)
Perinatal Transmission

- Risk of transmission about 4-5%
- Risk increases in the presence of HIV co-infection
- No need to avoid pregnancy or breastfeeding
- Test infants born to HCV-positive women (not before 18 months)

Source: CDC

Who Should be Tested?

- Any history of injection drug use (even once)
- Blood transfusion or solid organ transplant before July 1992
- Long-term dialysis
- Children born to HCV positive women
- People with signs of liver disease
- Anyone who is HIV+
- Occupational risk

National Hepatitis C Prevention Strategy, 2001
HCV Prevention

• *No Vaccine*!
• Avoid sharing needles (“works”)
• Avoid mixing drugs, alcohol with sexual activities
• Use standard precautions to avoid occupational exposures
• Practice safe sex - use a condom

HCV Serology
What the #!@*

- Meaning of antibody +
- Active vs resolved infection
- Acute vs chronic infection
- ALT levels fluctuate
- Intermittently viremic

Hepatitis C Serology

Source: CDC
Hepatitis C

Laboratory Tests - HCV

- **Hepatitis C antibody**
  (screening test)

- **RIBA-2** (confirmatory test)

- **HCV RNA**
  ~ Qualitative
  ~ Quantitative

Currently there is no reliable serological assay to accurately distinguish acute from chronic infection.
Understanding Results

- HCV Ab Ser QI EIA || Hepatitis C virus Ab: EIA, Positive, s/co ratio >11.0
- HCV RNA XXX QI PCR || Hepatitis C virus RNA: Probe.amp.tar, Positive
- HCV RNA SerPl PCR DL=50-aCnc || Hepatitis C virus RNA: Probe.amp.tar detection limit = 50 IU/mL, Positive

Other tests/indicators

- Liver enzymes (ALT)
- Liver biopsy... diagnostic gold standard
- Genotype...different viral strains of HCV
  ~ Genotype 1
  ~ Genotype 2
  ~ Genotype 3
HCV Treatment

Goals of Treatment

- Clear virus (Sustained Viral Response)
- Improve inflammation
- Improve liver health–scarring
- Slow disease progression
- Improve symptoms and quality of life
HCV Genotypes

- Six Major Genotypes (plus sub-types)
  - 1, 2, 3, 4, 5, 6 (1a, 1b, etc)
  - **Genotype 1** most common in U.S.
    - Genotype 1 –70% of US population;
    - Genotype 2 & 3 – 30% of US population

Strong predictor of treatment response

Source: CDC

Treatment Response

- Baseline
- Treatment
- Follow-up

**HCV RNA**

- Undetectable
- Undetectable

**Time**

- Nonresponder
- Partial Nonresponder
- Sustained Responder

Dr. Michael Fried, UNC
Standard Protocol

- **Pegylated interferon** (injected once weekly)
- **Ribavirin** (pill or capsule – twice a day)

<table>
<thead>
<tr>
<th>Genotype 1 – 48 weeks</th>
<th>Response rate = 40-50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genotype 2,3 – 24 weeks</td>
<td>Response rate = 70-80%</td>
</tr>
<tr>
<td>Cost per year</td>
<td>$ 20,000-$60,000</td>
</tr>
</tbody>
</table>

Source: CDC

Medication Side Effects

**INTERFERON**
- fatigue
- loss of appetite
- mood dysfunction-depression
- flu-like symptoms
- insomnia
- skin rashes, itching
- thrombocytopenia

**RIBAVIRIN**
- anemia
- shortness of breath
- insomnia
- loss of appetite
- rash, itching
- throat irritation/cough
- birth defects
HCV Protease Inhibitors

- Only approved for use with genotype 1
- Not approved for use in HIV/HCV co-infected patients
- Not approved for use in post-transplant recurrent HCV
- Not approved for use in children
- Treatment schedules are complex
- Threat of resistance

Source: TAG, 2011

New HCV Medication

**Incivek** (telaprevir)

- Taken in conjunction with interferon and ribavirin for 12 weeks
- Two pills taken 3 times a day with food (20 gms fat)
- With early response, treat for 24 weeks
- Response rate is 74%
- Side effects include rash, anemia, itching, anal/rectal irritation

Source: TAG, 2011
New HCV Medication

**Victrelis** (boceprevir)
- 4 week lead in with interferon and ribavirin, then add boceprevir for 24 weeks
- 4 capsules taken three times a day with food
- Duration of treatment depends on response
- Response rate is 65%
- Side effects include anemia, metallic taste in mouth, headache

Source: TAG, 2011

Surveillance and Reporting

- Only *Acute HCV* cases that meet CDC clinical case definition are reportable by physicians in North Carolina. There is no “probable” status.

- Past or Present (non-acute or chronic) HCV cases are *not currently* reportable in NC.
Case Investigation

Always ask the following:

- Was the patient symptomatic?
- Why were tests done?
- What tests were done? Verify the results!

Hepatitis C Case Definition

- Acute
- Contains both clinical and lab criteria
- Symptomatic, ALT, jaundice
- Serology results
- Use algorithm
HCV Control Measures

• 10A NCAC 41A .0214
• Infected person shall…
• Attending physician shall…
• Exposures
• Effective date - April 1, 2012

Preventing Transmission

Individuals who test positive for HCV should take every precaution to make sure that no one has direct exposure to their blood.

CDC recommends:
-- Covering cuts and sores on the skin
-- Never sharing items that might have blood on them
  * personal care (razors, toothbrushes)
  * home therapy (needles)
-- Never donating blood, body organs, other tissue
Important messages…

• HCV is not spread by:
  – sneezing, hugging, coughing, sharing eating utensils or drinking glasses, or casual contact

• HCV + persons should not be excluded from: work, school, play, child-care or other settings on the basis of their HCV status.

• HCV+ persons are not required to disclose their status to employers

Staying healthy

• No alcohol or reduce intake as much as possible
• Safe sex
• If PWID, don’t share equipment
• Don’t share personal items that could have blood on them
• Know your status…get tested
• Get vaccinated against hepatitis A and B if at risk
Take Home Points

- Slowly progressive, silent
- 2-4 million in US infected with chronic HCV
- No reliable serological test to accurately distinguish acute from chronic infection
- Treatment is expensive
- Control measures exist

Hepatitis Rules to Live By

- When investigating, always ask:
  - Why was testing done?
  - Was patient symptomatic?
  - Are there other lab results?
- Have case definitions handy
- Ensure control measures are issued

- *Never* merge Hepatitis B events in NC EDSS
References

The Centers for Disease Control and Prevention, Viral Hepatitis”, cdc.gov/hepatitis.


