Chronic Viral Hepatitis and Hepatocellular Carcinoma (HCC) in NYC

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Hep B Coalition
November 2015
U.S. HCC Epidemiology

- **Incidence:** 10\textsuperscript{th} most common cancer
- **Mortality:** 6\textsuperscript{th} most common cause of death from cancer
- Incidence and mortality are increasing, across US and NYC

Age-adjusted HCC Incidence Rates per 100,000, U.S., 2007-2011
Hepatocellular Carcinoma Incidence and Mortality in NYC, 1976-2012

- In 2012: 1,008 HCC cases (718 in men and 290 in women)
- Average rate in 2008-2012: 18/100,000 for males and 5.6/100,000 for females
Risk Factors

• **Major risk factors**: chronic hepatitis B (HBV)/hepatitis C (HCV), cirrhosis
  – Alcohol, environmental toxins, tobacco, obesity, diabetes, non-alcoholic fatty liver disease...

• ~80% HCC cases due to underlying chronic HBV/HCV
  – **HBV**: worldwide/developing countries/Asia
  – **HCV**: developed countries (U.S.)

Davila et al. Gastro 2004
Perz et al. J Hepatol 2006
American Cancer Society, 2015
Methods

• All HCC cases in NYC identified in New York State Cancer Registry (2001-2012), among NYC residents
  – Matched to NYC Dept. of Health hepatitis surveillance data (cases reported 1999-2012)

• Compared demographic characteristics, vital status, and survival time across groups defined by viral hepatitis status
  – HBV mono-infected
  – HCV mono-infected
  – HBV/HCV co-infected
  – Neither infection reported
Hepatitis Infection Status of HCC Cases New York City, 2001-2012

- 8,827 cases of HCC diagnosed
  - 58% infected with HBV, HCV, or both

- 1577 cases with Coinfection (18%)
- 3392 cases with HCV (38%)
- 3661 cases with HBV (42%)
- 197 cases with Neither infection (2%)
HCC Incidence Rates by Zip Code
Patient Characteristics

• Sex: overall 75% males
  – HCC/HBV: 85% males
• Race/ethnicity: overall 29% Hispanic, 29% white-NH
  – HBV: 63% Asian/PI
  – HCV: 35% Hispanic, 30% black-NH, 29% white-NH
  – HBV/HCV co-infected: 27% white-NH, 29% Hispanic
• Stage: 41% local, 22% regional, 16% distant
• Age: HBV cases diagnosed at youngest age (55) and die at youngest age (57); those with neither infection diagnosed at oldest age (68) and die at oldest age (70)
# Mortality Incidence and Median Survival Time

<table>
<thead>
<tr>
<th></th>
<th>HBV</th>
<th>HCV</th>
<th>Coinfection</th>
<th>Neither infection</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mortality Incidence (%)</strong></td>
<td>69.8</td>
<td>89</td>
<td>85.7</td>
<td>88.3</td>
<td>84.6</td>
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<tr>
<td><strong>Median survival time after HCC diagnosis, months</strong></td>
<td>22.3</td>
<td>13.1</td>
<td>14.9</td>
<td>6.9</td>
<td>10.9</td>
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Survival Curves, by hepatitis status and HCC stage at diagnosis

a) Overall

b) Local Stage

c) Regional Stage

d) Distant Stage
Discussion

• Most HCC cases in NYC have chronic viral hepatitis, mostly HCV
• Patterns of HCC in NYC mirror hepatitis B and C patterns
  – Geographic distribution
  – Sex and race distributions
  – Age at HCC diagnosis
Discussion

• Survival differs significantly by viral hepatitis infection status
  – Neither infection: worst survival
    • Unrecognized HCC risk factors $\rightarrow$ missed opportunities for screening and early detection?
    • Older age at diagnosis $\rightarrow$ more co-morbid conditions?
  – HCV: survival similar to those with no infection
    • Worse liver health due to cirrhosis? Co-morbid conditions? Systemic effects of HCV infection
  – HBV: best survival
    • HBV diagnosed earlier? Better overall health/liver health?
Public Health Implications

• Recommended HBV and HCV screening should be more widely and consistently implemented to identify patients early and begin monitoring for HCC early

• Improvements are needed in screening for HCC in those with non-viral hepatitis risk factors

• Those with HCV should be treated early, before the development of cirrhosis, to prevent the development of and death from HCC