Health Utilities in Chronic Hepatitis C Patients with Decompensated Cirrhosis or Hepatocellular Carcinoma

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DISCLOSURE

- I have no actual or potential conflict of interest in relation to this topic or presentation.
BACKGROUND
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- Chronic hepatitis C (CHC) is a curable viral liver disease
- Can lead to decompensated cirrhosis, hepatocellular carcinoma (HCC), and death
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Can lead to decompensated cirrhosis, hepatocellular carcinoma (HCC), and death.

Mild to moderate CHC:

- Nonspecific symptoms e.g. fatigue, mild cognitive impairment.
Chronic hepatitis C (CHC) is a curable viral liver disease. It can lead to decompensated cirrhosis, hepatocellular carcinoma (HCC), and death.

**BACKGROUND**

- **Mild to moderate CHC:**
  - Nonspecific symptoms e.g. fatigue, mild cognitive impairment

- **Severe CHC (decompensated cirrhosis and HCC):**
  - Severe symptoms e.g. ascites, hepatic encephalopathy, esophageal bleeding
• Health utility incorporates patient’s **health state** and **preference** for that state
  • Range from 0 (death) to 1 (perfect health)
  • Important for understanding burden of disease from patient perspective
• Health utility incorporates patient’s health state and preference for that state
  • Range from 0 (death) to 1 (perfect health)
  • Important for understanding burden of disease from patient perspective
  • Allows comparison between different diseases
  • Can provide information about health disparities
  • Can inform research and policy
  • Can be used in economic analysis
Previous Literature on Utilities in Hepatitis C

- **No cirrhosis (n = 5389)**: EQ-5D Utility (mean, 95% CI) = 0.81
- **Compensated cirrhosis (n = 376)**: EQ-5D Utility (mean, 95% CI) = 0.70
- **Decompensated cirrhosis (n = 62)**: EQ-5D Utility (mean, 95% CI) = 0.66
- **HCC (n = 19)**: EQ-5D Utility (mean, 95% CI) = 0.82
PURPOSE
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• Elicit health utilities from CHC patients with advanced liver disease, including decompensated cirrhosis and HCC
PURPOSE

• Elicit health utilities from CHC patients with advanced liver disease, including decompensated cirrhosis and HCC
  • To better understand the burden of advanced CHC and factors that affect this burden
  • Economic analyses of screening and treatment can use these data to understand the benefits of averting progression of CHC
METHODS
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• Recruited 130 CHC patients at 3 clinics in Toronto, ON from Aug 2015 – March 2017:
  • Liver clinic at Toronto General Hospital
  • Liver transplant clinic at Toronto General Hospital
  • Gastrointestinal clinic at Princess Margaret Cancer Centre
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• Recruited 130 CHC patients at 3 clinics in Toronto, ON from Aug 2015 – March 2017:
  • Liver clinic at Toronto General Hospital
  • Liver transplant clinic at Toronto General Hospital
  • Gastrointestinal clinic at Princess Margaret Cancer Centre
• Patients with no cirrhosis, compensated cirrhosis, decompensated cirrhosis, and/or HCC recruited
  • Estimated utilities separately for each subgroup
  • Regression model to assess effects of socio-demographic and clinical variables on utilities
METHODS

• Survey measured:
  1. Health utilities and quality of life using standardized instruments
  2. Clinical information
     • Liver disease severity, comorbidities
  3. Socioeconomic factors
     • Substance use, mental health
METHODS

• Survey measured:

  1. Health utilities and quality of life using standardized instruments:
     • EuroQol-5D (EQ-5D)
     • Health Utilities Index Mark 2/3 (HUI2/HUI3)
     • Visual Analogue Scale (VAS)
     • Time Trade-off (TTO)
     • Hepatitis Quality of Life Questionnaire (HQLQ) (includes SF-36)

  2. Clinical information
     • Liver disease severity, comorbidities

  3. Socioeconomic factors
     • Substance use, mental health
RESULTS
## RESULTS

### Baseline Characteristics

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Age</strong></td>
<td>58 ± 10</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>61%</td>
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</tbody>
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### Liver Disease Severity

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>No Cirrhosis</td>
<td>48 (37%)</td>
</tr>
<tr>
<td>Compensated Cirrhosis</td>
<td>44 (34%)</td>
</tr>
<tr>
<td>Decompensated Cirrhosis</td>
<td>25 (19%)</td>
</tr>
<tr>
<td>Hepatocellular Carcinoma</td>
<td>13 (10%)</td>
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### Comorbidities

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>HIV Positive</td>
<td>1%</td>
</tr>
<tr>
<td>Charlson Comorbidity Score</td>
<td>1.3 ± 1.7</td>
</tr>
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</table>
# RESULTS

<table>
<thead>
<tr>
<th>Socioeconomic Characteristics</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Immigrant</td>
<td>42%</td>
</tr>
<tr>
<td>Married</td>
<td>50%</td>
</tr>
<tr>
<td>Education: High School or Less</td>
<td>Post-secondary</td>
</tr>
<tr>
<td>Unemployed</td>
<td>Receiving Support (Disability Pension or Welfare)</td>
</tr>
<tr>
<td>Past IVDU</td>
<td>Current IV or Intranasal Drug Use</td>
</tr>
<tr>
<td>History of Mental Illness</td>
<td>History of Alcohol Dependence</td>
</tr>
</tbody>
</table>
Results

Health Utilities by Disease Severity and Utility Instrument

No cirrhosis (n = 48)  
Compensated cirrhosis (n = 44)  
 Decompensated cirrhosis (n = 25)  
HCC (n = 13)
## Results

### Regression Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>EQ5D</th>
<th>HUI2</th>
<th>HUI3</th>
<th>VAS</th>
<th>TTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Sex</td>
<td>0.07</td>
<td>0.03</td>
<td>0.06</td>
<td>0.05</td>
<td>-0.03</td>
</tr>
<tr>
<td>Cirrhosis</td>
<td>-0.16*</td>
<td>-0.09</td>
<td>-0.14</td>
<td>-0.07</td>
<td>-0.08</td>
</tr>
<tr>
<td>Decompensated cirrhosis or HCC</td>
<td>0.05</td>
<td>0.03</td>
<td>0.02</td>
<td>-0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>History of mental illness</td>
<td>-0.15*</td>
<td>-0.12*</td>
<td>-0.17*</td>
<td>-0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Receiving governmental support</td>
<td>-0.06</td>
<td>-0.04*</td>
<td>-0.13</td>
<td>-0.11*</td>
<td>-0.07</td>
</tr>
<tr>
<td>Charlson Comorbidity Index</td>
<td>0.01</td>
<td>0.00</td>
<td>-0.02</td>
<td>-0.01</td>
<td>-0.02</td>
</tr>
</tbody>
</table>

*p < 0.05
Comparison to Previous Literature

EQ-5D Utility (mean, 95% CI)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Study</th>
<th>Meta-analysis</th>
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<tbody>
<tr>
<td>No cirrhosis</td>
<td>0.85</td>
<td>0.81</td>
</tr>
<tr>
<td>Compensated cirrhosis</td>
<td>0.72</td>
<td>0.70</td>
</tr>
<tr>
<td>Decompensated cirrhosis</td>
<td>0.76</td>
<td>0.66</td>
</tr>
<tr>
<td>HCC</td>
<td>0.69</td>
<td>0.82</td>
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DISCUSSION
• Preliminary results suggest:
  
  • Compensated cirrhosis may cause a significant reduction in patients’ quality of life
  
  • Decompensation and HCC may not cause a significant additional reduction in quality of life
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• Preliminary results suggest:
  • Compensated cirrhosis may cause a significant reduction in patients’ quality of life
  • Decompensation and HCC may not cause a significant additional reduction in quality of life
  • Unexpected since severe symptoms associated with decompensation and HCC but not with compensated cirrhosis
    • Similarity to previous studies’ results may suggest true burden of CHC has been captured
    • Alternatively, may be a reflection of a small sample size and/or selection bias
• We recruited patients from outpatient clinics
  • All patients in our study were ambulatory
  • Many not experiencing severe symptoms at time of survey
    • Sicker patients also more likely to decline survey
DISCUSSION

• We recruited patients from outpatient clinics
  • All patients in our study were ambulatory
  • Many not experiencing severe symptoms at time of survey
    • Sicker patients also more likely to decline survey
  • Patients with significant decompensation and associated symptoms often admitted to hospital and thus do not attend outpatient clinics
  • To fully capture the spectrum of decompensated cirrhosis, we will recruit hospital inpatients admitted for decompensated cirrhosis
  • May experience a larger burden of disease than patients from ambulatory clinics
CONCLUSION
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• Important to understand true burden of CHC from patient perspective
  • To inform clinical practice, research, and health policy
  • To inform cost-effectiveness analyses that reflect the true impacts of late-stage disease and the benefits of averting these impacts
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• Next steps
  • Expanding study to additional sites in Canada
  • Measuring health utilities pre- and post-DAA treatment
ACKNOWLEDGEMENTS

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  • Alice Fried, Mohammed Alhokail, Suzanne Chung, Welson Ryan, Josephine F. Wong, Jordan J. Feld, David Wong, Hemant Shah, Julie Bruneau, Zeny Feng, Nicholas Mitsakakis, Jeff Powis, Valeria E. Rac, Karen E. Bremner

• Principal Investigators: Murray D. Krahn, William W. L. Wong

• Funding:
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THANK YOU. QUESTIONS?
<table>
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<tr>
<th>First author</th>
<th>Utility measures</th>
<th>n</th>
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<tbody>
<tr>
<td><strong>Decompensated Cirrhosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bjornsson</td>
<td>EQ5D</td>
<td>53</td>
</tr>
<tr>
<td>Chong</td>
<td>EQ5D, VAS, HUI3, SG</td>
<td>9</td>
</tr>
<tr>
<td>Hsu 2009</td>
<td>HUI2, HUI3, TTO, SF6D</td>
<td>57</td>
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<tr>
<td>Sherman</td>
<td>VAS, TTO, SG</td>
<td>8</td>
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<tr>
<td>Siebert</td>
<td>VAS</td>
<td>37</td>
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<td><strong>Hepatocellular Carcinoma</strong></td>
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<tr>
<td>Vargas</td>
<td>EQ5D</td>
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