COVID-19 and Alcohol-associated Liver Disease

Moderated by: Ashwani K. Singal, MD, MS, FACP, FAASLD
&
Pranoti Mandrekar, PhD, FAASLD
Webinar Moderators

Ashwani K. Singal, MD, MS, FACG, FAASLD
- Associate Professor of Medicine, University of South Dakota
- Chair – AASLD Alcohol-associated Liver Disease SIG

Pranoti Mandrekar, PhD, FAASLD
- Professor, University of Massachusetts Medical School
- Chair-Elect – AASLD Alcohol-associated Liver Disease SIG
Webinar Agenda

Talks

Webinar and Presenter Introductions

"Alcohol Use During COVID-19: Impact Unknown”

“How is COVID-19 Affecting Alcohol-Associated Liver Disease?”

Panel Discussion / Q&A

Speakers

Drs. Pranoti Mandrekar & Dr. Ashwani Singal

Dr. Brenda Curtis

Dr. Andrew Moon

All
Webinar Q&A

• Submit your questions anytime during the webinar in the Q&A box at the top or bottom of your screen.

• Questions will be answered at the end of the presentations.
Webinar Presenter

Brenda Curtis, PhD MsPH

• Tenure Track Investigator
• Technology and Translational Research Unit, Chief
• Translational Addiction Medicine Branch, NIDA-IRP
Webinar Presenter

Andrew Moon, MD, MPH

- Advanced/Transplant Hepatology Fellow, University of North Carolina
Webinar Panelist

Elizabeth C. Verna, MD, MSc
- Director of Clinical Research, Columbia University Transplant Initiative and the Transplant Clinical Research Center
- Director of Hepatology Research, Columbia University Division of Digestive and Liver Disease

Oren K. Fix, MD, MSc, FAASLD
- Medical Director, Liver Transplant Program, Swedish Medical Center, Seattle, WA
- Clinical Associate Professor, Washington State University Elson S. Floyd College of Medicine
Alcohol Use During COVID-19: Impact Unknown

Brenda Curtis, PhD, MsPH
NIDA/IRP Technology and Translational Research Unit
Translational Addiction Medicine Branch
Covid 19, Alcohol Consumption & Potential Impacts

- Alcohol Consumption & the Immune System
  - Susceptibility & Severity
- Stress, Anxiety, & Well-being
  - Consumption & AUD symptoms
- Social Isolation & Physical Distancing
  - Consumption & AUD symptoms
- Alcohol-Associated Liver Disease
  - Healthcare access & treatment
Covid 19 & Alcohol Consumption

- Early epidemiological and marketing data indicate a spike in use of alcohol and other drugs by the general population.

- Week ending March 21, sales of distilled liquor were 75% greater than during the same week in 2019; beer sales, 66% greater.

- Compared with this time a year ago, during the seven-week COVID-impacted period ended April 25,
  - brick-and-mortar alcohol dollar sales up 26%
  - online sales of alcohol have skyrocketed 477%
CONSUMERS GRAVITATE TO LARGER PACK SIZES

PACK SIZE TREND FOR “OFF PREMISE”

<table>
<thead>
<tr>
<th></th>
<th>% GROWTH</th>
<th>PRE COVID-19</th>
<th>DURING COVID-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boxed Wine</td>
<td>+5%</td>
<td></td>
<td>+44%</td>
</tr>
<tr>
<td>1.75L Spirits</td>
<td>+2%</td>
<td></td>
<td>+47%</td>
</tr>
</tbody>
</table>

BEER/CIDER/FMB

<table>
<thead>
<tr>
<th>Pack Size</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-packs</td>
<td>20.9%</td>
</tr>
<tr>
<td>24-packs</td>
<td>19.8%</td>
</tr>
<tr>
<td>6-packs</td>
<td>-2.0%</td>
</tr>
</tbody>
</table>

PREFERRED SERVING SIZE FROM “ON PREMISE”

Q: How would you order alcohol with take out / delivery?

<table>
<thead>
<tr>
<th>Category</th>
<th>% Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEER</td>
<td></td>
</tr>
<tr>
<td>Multi pack cans</td>
<td>40%</td>
</tr>
<tr>
<td>TABLE WINE</td>
<td></td>
</tr>
<tr>
<td>750mL bottles</td>
<td>51%</td>
</tr>
<tr>
<td>SPARKLING WINE</td>
<td></td>
</tr>
<tr>
<td>750mL bottles</td>
<td>47%</td>
</tr>
<tr>
<td>SPIRITS</td>
<td></td>
</tr>
<tr>
<td>750mL bottles</td>
<td>47%</td>
</tr>
</tbody>
</table>

Source: Nielsen Retail Measurement Services, Total US All Outlets Combined (xAOC) including Convenience and Liquor Stores, latest period ended Apr. 18, 2020 versus year-ago. FMB = Flavored Malt Beverages, “Off premise” refers to locations that are able to legally sell alcohol for personal consumption.

Source: Nielsen CGA, Custom consumer research fielded in Apr. 2020, “On premise” refers to outlets licensed for the sale and consumption of alcohol on the premises of the establishment.

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Digital Phenotyping, AUD research & COVID-19
## Specific Aims

<table>
<thead>
<tr>
<th>Examine</th>
<th>Investigate</th>
<th>Improve</th>
</tr>
</thead>
</table>
| Examine effects of the Covid-19 pandemic on drug use, drug-related behaviors, consequences of drug use, in people with and without AUD/SUDs at the start of the study | Investigate bidirectional effects between the Covid-19 pandemic and access/adherence to treatment, in people who have or develop AUD/SUDs | Improve our methodology for the detection of daily-life behavioral markers of:  
- movement patterns, weight/diet  
- social interactions, support, & distancing  
- substance use  
- resilience and wellbeing  
- psychological problems |

Unpublished. Curtis, Epstein, Leggio, 2020
Study Design

**Baseline**
- Social Media
- PHQ-9
- Drug Use
- GAD-7
- COVID
- N=2500

**30 Days**

**EMA**

**DAY 60**
- Social Media
- PHQ-9
- Drug Use
- GAD-7
- COVID

**Day 90**
- Social Media
- PHQ-9
- Drug Use
- GAD-7
- COVID

**Day 120**
- Social Media
- PHQ-9
- Drug Use
- GAD-7
- COVID

Smartphone Sensor Study
- **Smartphone Sensor Study**
- N=300

Unpublished. Curtis, Epstein, Leggio, 2020
## Smartphone Sensor Study: Digital Phenotyping

<table>
<thead>
<tr>
<th>Sensor Data Source</th>
<th>Physical Movement</th>
<th>Social Interactions</th>
<th>Daily Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerometer</td>
<td>😊</td>
<td></td>
<td>😊</td>
</tr>
<tr>
<td>Bluetooth</td>
<td></td>
<td>😊</td>
<td></td>
</tr>
<tr>
<td>GPS</td>
<td>😊</td>
<td></td>
<td>😊</td>
</tr>
<tr>
<td>Light sensor</td>
<td></td>
<td></td>
<td>😊</td>
</tr>
<tr>
<td>Wi-Fi scans</td>
<td>😊</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone use logs (call/SMS)</td>
<td></td>
<td>😊</td>
<td>😊</td>
</tr>
<tr>
<td>App use logs</td>
<td></td>
<td>😊</td>
<td>😊</td>
</tr>
<tr>
<td>Social Media Language*</td>
<td></td>
<td>😊</td>
<td>😊</td>
</tr>
</tbody>
</table>
Preliminary Results - Demographics

- N = 568, Mean Age = 35.84, SD = 13.07
- 74% White
- 62% Bachelor’s degree or higher
- 45% under $50k income
- Substance use history:
  - 60% Cannabis
  - 78% Alcohol
  - 30% Opiates
  - 12% Cocaine
Preliminary Results
Experiences During COVID-19

● 4% diagnosed with COVID-19
● Concern for themselves (82%) or loved ones (89%) getting COVID-19
● More anxiety (77%) and depression (53%)
● Personal financial loss (77%)
● Increase in alcohol use (28%)

Unpublished. Curtis, Epstein, Leggio, 2020
Language changes in 2020 (vs 2019)

Changes in language estimated psychological distress

Unpublished. Curtis, Epstein, Leggio, 2020
Physical Distancing

Data from the UK: (telephone survey 2 months after lockdown, pre-existing AUD patients)

- 20% of individuals increasing or decreasing their normal alcohol consumption
  - Decrease probably associated with decrease financial ability and decreased availability of on-site alcohol areas
References


How is COVID-19 Affecting Alcohol-Associated Liver Disease?

Andrew M. Moon, MD, MPH
Advanced/Transplant Hepatology Fellow
University of North Carolina
Disclosures

No potential conflicts of interest to disclose.

My research was supported in part by NIH grant T32 DK007634.
Pre-COVID Burden of ALD
Rising Prevalence and Costs of ALD


ALD Most Common LT Indication

ALD Deaths on the Rise


<table>
<thead>
<tr>
<th></th>
<th>AAPC (1999-2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Women, 25-34</strong></td>
<td>6.07 (2.95-9.28)</td>
</tr>
<tr>
<td><strong>Women, 65-74</strong></td>
<td>1.81 (0.92-2.71)</td>
</tr>
<tr>
<td><strong>Men, 25-34</strong></td>
<td>4.95 (3.21-6.73)</td>
</tr>
<tr>
<td><strong>Men, 65-74</strong></td>
<td>1.15 (0.31-2.00)</td>
</tr>
</tbody>
</table>
COVID-19 Outcomes in ALD
COVID-19 in ALD
### COVID-19 in ALD

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Odds Ratio (95%CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>1.02 (1.01–1.04)</td>
<td>0.011</td>
</tr>
<tr>
<td>Sex (male)</td>
<td>0.72 (0.47–1.13)</td>
<td>0.154</td>
</tr>
<tr>
<td>Ethnicity (white)</td>
<td>1.40 (0.90–2.18)</td>
<td>0.135</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liver disease severity</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CLD without cirrhosis</td>
<td>1.00 (REF)</td>
<td>-</td>
</tr>
<tr>
<td>CTP-A</td>
<td>1.90 (1.03–3.52)</td>
<td>0.040</td>
</tr>
<tr>
<td>CTP-B</td>
<td>4.14 (2.24–7.65)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CTP-C</td>
<td>9.32 (4.80–18.08)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aetiology</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NAFLD</td>
<td>1.01 (0.57–2.27)</td>
<td>0.965</td>
</tr>
<tr>
<td>ALD</td>
<td>1.79 (1.03–3.13)</td>
<td>0.040</td>
</tr>
<tr>
<td>HBV</td>
<td>0.96 (0.41–2.23)</td>
<td>0.926</td>
</tr>
<tr>
<td>HCV</td>
<td>1.09 (0.58–2.06)</td>
<td>0.785</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Co-factors</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>0.49 (0.21–1.19)</td>
<td>0.116</td>
</tr>
<tr>
<td>Obesity</td>
<td>1.27 (0.79–2.02)</td>
<td>0.319</td>
</tr>
<tr>
<td>Heart disease</td>
<td>1.14 (0.68–1.90)</td>
<td>0.627</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>1.19 (0.75–1.90)</td>
<td>0.459</td>
</tr>
<tr>
<td>Hypertension</td>
<td>0.98 (0.62–1.53)</td>
<td>0.914</td>
</tr>
<tr>
<td>COPD</td>
<td>0.86 (0.40–1.85)</td>
<td>0.707</td>
</tr>
<tr>
<td>HCC</td>
<td>1.46 (0.67–3.18)</td>
<td>0.346</td>
</tr>
<tr>
<td>Non-HCC cancer</td>
<td>1.28 (0.60–2.72)</td>
<td>0.525</td>
</tr>
<tr>
<td>Creatinine (mg/dL)</td>
<td>1.11 (0.94–1.32)</td>
<td>0.208</td>
</tr>
</tbody>
</table>

Effects of Excess Alcohol Use on ALD
Effect of Excess Alcohol Use on ALD

Unsafe Alcohol Use

Binge Drinking

Effect of Excess Alcohol Use on ALD

Effect of Alcohol Use on Mortality in AH

Follow-up: 3 mos x 1 year 6 mos thereafter → Median Follow-up 42 months

70% mortality in steroid non-responders at 6 mos

<table>
<thead>
<tr>
<th>Alcohol consumption</th>
<th>Patients-months at risk</th>
<th>Death</th>
<th>Unadjusted HR (95%CI)</th>
<th>P</th>
<th>Adjusted HR (95%CI)</th>
<th>P *</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 g/day</td>
<td>7389</td>
<td>38</td>
<td>1.00 (reference)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1-29 g/day</td>
<td>471</td>
<td>6</td>
<td>2.36 (0.99-5.60)</td>
<td>0.052</td>
<td>2.27 (0.96-5.40)</td>
<td>0.063</td>
</tr>
<tr>
<td>30-49 g/day</td>
<td>519</td>
<td>8</td>
<td>3.20 (1.48-6.90)</td>
<td>0.003</td>
<td>3.59 (1.66-7.79)</td>
<td>0.001</td>
</tr>
<tr>
<td>50-99 g/day</td>
<td>1106</td>
<td>20</td>
<td>3.51 (2.03-6.06)</td>
<td>&lt;0.0001</td>
<td>3.59 (2.08-6.21)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>≥ 100 g/day</td>
<td>928</td>
<td>27</td>
<td>5.61 (3.41-9.23)</td>
<td>&lt;0.0001</td>
<td>6.01 (3.64-9.91)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Hazard ratios (HR) and their 95% confidence intervals (CIs) were calculated from Cox models (*adjusted for Lille model) using a landmark at 6 months. Llouvet et al. *Hepatology* 2017.
Effect of Alcohol Use on Mortality in ALD

Effect of COVID-19 on ALD?
Cirrhosis Hospitalizations in COVID Era

Post-COVID Increase in AH

<table>
<thead>
<tr>
<th></th>
<th>Admissions</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>May-Oct 19</td>
<td>377</td>
<td>-</td>
</tr>
<tr>
<td>May-Oct 20</td>
<td>505</td>
<td>+34%</td>
</tr>
</tbody>
</table>

Stay at home order
De-Listing from Liver Transplant List

Increased risk of relapse in listed patients

Delisting

Conclusions

• Prior to COVID-19, alcohol-associated liver disease had a large and growing burden
• COVID-19 outcomes may be worse in ALD patients
• Psychosocial strain and limited access to healthcare has likely led to higher risk alcohol consumption patterns
• Increased alcohol use has the potential to significantly increase morbidity and mortality from ALD
• Early data suggest that patients with ALD may be experiencing increased complications and poor outcomes in COVID-19 era
Thank you and stay safe!

@AndrewMMoon

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Panel Discussion

Please submit your questions to the Q&A Chat now.