Assessing heavy alcohol use and risky single occasion drinking using an alcohol biomarker among young Swiss men

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Background

• Excessive alcohol drinking:
  • a major health issue worldwide
  • 3 million deaths / around 5% of all deaths
  • 75% are men
  • affect mainly young people (20 to 39 years old) with mortality increasing up to 25%
  • 3rd leading risk factor for poor health
  • strong economic impact
  • huge societal consequences (e.g., suicides, violence, road traffic crashes, crime, victimization)
Background

• Highest level of alcohol use in European countries
  • alcohol use 50% higher than in the world population
  • even if this consumption is decreasing since 2005
  • decrease also in young people

• However, alcohol use in young people remains an important health issue
  • In Europe and in Switzerland
Background

- Especially for one specific harmful drinking pattern:
  - risky single occasion drinking (RSOD): drinking more than 6 units of alcohol at a single occasion for men
  - RSOD is very popular among young people in the world and in Switzerland
  - with more than 40% of young Swiss men reporting regular RSOD event during the last 12 months (at least monthly)
  - harmful drinking pattern likely to be maintained over a long period
Background

• Need of good indicators
  • at the population level
  • to monitor alcohol consumption
  • whole population
  • specific at-risk groups

• Reliability and validity of EtG (Ethyl glucuronide in hair) as an indicator for excessive chronic drinking
  • = average ethanol daily intake of 60 g

• long-term alcohol use biomarkers thanks to its long detection window
  • retrospective evaluation of alcohol use with an average of 1.1 ± 0.2 cm hair growth per month
Background

• Use of biomarkers as EtG at the population level not feasible

• Ideally: self-reported measures of alcohol use
  • offer critical information about alcohol consumption in large samples

• However: self-reported measures of alcohol consumption
  • largely criticized in the literature
  • → there is a need of investigating the reliability of self-reported measures compared to ethanol biomarkers to reinforce the usefulness of self-reported measures
Aim

• To provide empirical evidence of self-reported alcohol use measures to assess excessive chronic drinking measured with an objective biomarker, EtG:

1. evaluate the quality of:
   two self-reported measures of alcohol use: previous twelve-month alcohol use and previous-week alcohol use
   one measure of harmful drinking pattern: RSOD

2. assess the usefulness of self-reported RSOD measure in predicting excessive chronic drinking

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SADYSM data

- **SADYSM**: Screening for Alcohol Dependence among Young Swiss Men
- **Design**: controlled cross-sectional study
- **Location**: Switzerland
- **Population**: French-speaking young Swiss men enrolled in a larger cohort study (Swiss Cohort Study on Substance Use and Risk Factors, C-SURF)
- **Sample**: random stratified sample
Population of the cohort study
N = 2668

51.4% completed the AUDIT

330 participants invited
n=193 AUDIT ≥ 13
n=137 AUDIT < 13

n=233
Response rate = 71%

EtG material
n=227
97%

AUDIT: Alcohol Use Disorder Identification Test
Measures

• **Gold standard**: biomarker of alcohol excessive chronic drinking: hair ethylglucuronide (EtG)
  • Excessive chronic drinking: 1: EtG ≥ 30; 0: EtG < 30

• **Self-reported measures**:
  • *Twelve-month alcohol use*. The number of drinks per week is obtained multiplying average frequency of drinking and quantity of drinking.
  • *Previous-week alcohol use*. The number of drinks per week is obtained through a past-week diary of the number of drinks consumed for the previous seven days for each day of the week and different kinds of alcohol
  • *Risky single-occasion drinking*. "On the same occasion, how often do you drink six standard drinks or more?", ‘never’, ‘less than monthly’, ‘monthly’, ‘weekly’ and ‘daily’.
Statistical analysis

• To assess the quality of self-reported alcohol use measures
  • Comparison of three self-reported measures against EtG with sensitivity and specificity
  • To assess the usefulness of self-reported RSOD measure in predicting excessive chronic drinking
  • Univariate and multivariate logistic regressions
### Results

Table 1: Self-reported measures of alcohol consumption and hEtG for the whole sample and by level of hEtG

<table>
<thead>
<tr>
<th></th>
<th>Whole (n=227, 100%)</th>
<th>hEtG&lt;30 (n=174, 76.7%)</th>
<th>hEtG≥30 (n=53, 23.3%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[min - max]</td>
<td>[p25 ; p75]</td>
<td>[p25 ; p75]</td>
</tr>
<tr>
<td></td>
<td>1mean +/- sd or % (n)</td>
<td>p50</td>
<td>mean +/- sd</td>
</tr>
<tr>
<td>RSOD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>3.1% (7)</td>
<td>1.1% (2)</td>
<td>9.4% (5)</td>
</tr>
<tr>
<td>Weekly</td>
<td>34.4% (85)</td>
<td>28.7% (50)</td>
<td>66% (35)</td>
</tr>
<tr>
<td>Monthly</td>
<td>28.2% (64)</td>
<td>31.0% (54)</td>
<td>18.9% (10)</td>
</tr>
<tr>
<td>Less than monthly</td>
<td>24.2% (55)</td>
<td>29.9% (52)</td>
<td>5.7% (3)</td>
</tr>
<tr>
<td>Never</td>
<td>7.1% (16)</td>
<td>9.2% (16)</td>
<td>0.0% (0)</td>
</tr>
<tr>
<td>Twelve-month alcohol use</td>
<td>[0.4 - 91.0]</td>
<td>[4.7 ; 18.0]</td>
<td>[3.5 ; 14.5]</td>
</tr>
<tr>
<td></td>
<td>+/- 13.6</td>
<td>+/- 11.1</td>
<td>+/- 16.5</td>
</tr>
<tr>
<td>Previous-week alcohol use</td>
<td>[0 - 153]</td>
<td>[7.0 ; 28.0]</td>
<td>[5 ; 23]</td>
</tr>
<tr>
<td></td>
<td>+/- 17.0</td>
<td>+/- 14.3</td>
<td>+/- 21.7</td>
</tr>
<tr>
<td>AUDIT</td>
<td>[1 - 31]</td>
<td>[8.0 ; 16.0]</td>
<td>[6.0 ; 15.0]</td>
</tr>
<tr>
<td></td>
<td>+/- 6.2</td>
<td>+/- 5.9</td>
<td>+/- 5.7</td>
</tr>
<tr>
<td>hEtG</td>
<td>[0 - 691]</td>
<td>[2.8 ; 28]</td>
<td>[2.8 ; 13.0]</td>
</tr>
<tr>
<td></td>
<td>+/- 53.8</td>
<td>+/- 7.8</td>
<td>+/- 94.1</td>
</tr>
</tbody>
</table>

1: mean +/- sd for quantitative variables and % (n) for categorical variables; sd: standard deviation; p50: median; p25: first quartile; p75: third quartile; RSOD: Risky single-occasion drinking; AUDIT: Alcohol Use Disorder Identification Test; hEtG: ethyl glucuronide in hair
Figure 1: A comparison of the diagnostic performance of the self-reported measures in detecting heavy alcohol consumption (>60 g/day) using ROC curve analysis. AUROC, area under the receiver operating characteristics curve.

12-MONTH: SE=75.5%; SP=78.7%; TH >15
7-DAY: SE=66.0%; SP=66.1%; TH ≥19
RSOD: SE=75.5%; SP=70.1%; TH ≥ WEEKLY

RSOD R: Risky single-occasion drinking Reversed; Previous week: Previous use alcohol use; 12-month: Twelve-month alcohol use.
### Results

Outcome: Excessive chronic drinking: 1: EtG ≥ 30; 0: EtG < 30

<table>
<thead>
<tr>
<th></th>
<th>Univariate</th>
<th>Multivariate</th>
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<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% IC</td>
</tr>
<tr>
<td>Twelve-month alcohol use</td>
<td>10.65</td>
<td>[5.18; 21.88]</td>
</tr>
<tr>
<td>Previous-week alcohol use</td>
<td>3.79</td>
<td>[1.98; 7.25]</td>
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<tr>
<td>RSOD</td>
<td>7.22</td>
<td>[3.57; 14.61]</td>
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</table>
Conclusion: alcohol use

- Self-reported measures of previous twelve-month alcohol use and RSOD are acceptable measures of excessive chronic drinking for population-based screening

- Self-reported alcohol use (twelve months) seems reliable for population-based assessments
Conclusion: RSOD

- Self-reported RSOD seems to be an interesting screening measure in addition to previous twelve-month to predict excessive chronic drinking among young people

- Future studies using biomarkers should also focus on drinking pattern which seems a promising indicator of chronic excessive drinking beyond alcohol consumption
Thank you for your attention

Any questions?