The DRAM, Vol. 7(6) – Biomarker testing: Detecting heavy alcohol consumption and relapse among DUI offenders

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This week, the DRAM continues its series focusing on driving under the influence (DUI). This is the second of five issues concentrating on the body of recent DUI research. In the first issue, DRAM Vol. 7(5), we discussed how different DUI-related events exhibit different trends across time.

DUI recidivism is a difficult phenomenon to prevent or limit. European countries have used biomarker tests to monitor DUI offenders since the 1980s (Morgan & Major, 1996). Biomarkers provide objective evidence for heavy drinking, a known factor associated with recidivism. This week, the DRAM reviews a study (Bean, Roska, Harasymiw, Pearson, Kay, & Louks, 2009) that examined whether biomarkers can (1) identify DUI repeat offenders who continue to drink heavily after arrest and (2) detect instances of heavy drinking during a 12-month follow-up.

Methods

- Participants were 200 third and fourth time repeat DUI offenders who provided a blood sample once every three months for 12 months as part of court-mandated assessments required to re-instate their licenses.
- Researchers used these blood samples to calculate Early Detection of Alcohol Consumption (EDAC) and Carbohydrate-Deficient Transferrin (CDT) scores.
    - EDAC compares an individual's alcohol blood level to samples provided by prototypical heavy drinkers in past research. The results indicate the probability that the individual is a heavy drinker. In this study, a probability of 40% or higher was considered indicative of heavy drinking. Gaining or losing thirty points (e.g., from 40% to 70% or from 40% to 10%) signified relapse and remission, respectively.
    - CDT measures the percent of transferrin (i.e., a type of protein in the blood stream) that is carbohydrate-deficient. In this study, a score higher than 2.2% indicated heavy drinking.

Results

- Biomarker tests identified 40 participants (20%) as heavy drinkers at baseline (i.e., first assessment after arrest); only 13 of those 40 admitted to drinking within the past 30 days. Investigation of the self-reports of individuals who reported drinking but did not meet biomarker cut-points for heavy drinking confirmed that these individuals reported low to moderate drinking.
- The Figure presents the baseline EDAC and CDT scores for three categories of drivers:
    - Abstainer/Reducers (52%) included those who either were below biomarker cutpoints for heavy drinking at all assessments or decreased their drinking consistently throughout the follow-up.
    - The relapse group (18%) included all drivers who did not decrease their drinking or remain abstinent according to biomarkers. As the Figure shows, this group had elevated baseline biomarker scores compared to the other groups.
    - The noncompliant group (30%) included all drivers who did not complete biomarker testing at the required follow-up periods.

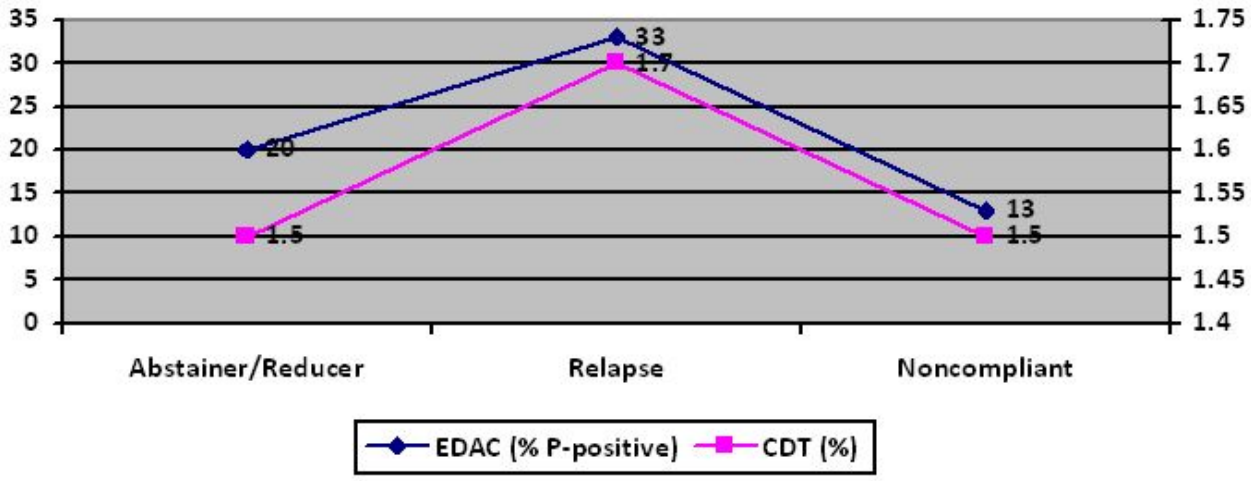

Figure. EDAC and CDT Scores at Baseline. Click image to enlarge.

Limitations

- These biomarker tests specifically target heavy drinkers, and therefore cannot identify instances of below-threshold alcohol consumption.
- Because biomarkers only detect heavy drinking within the past 2-3 weeks and researchers conducted follow-ups every three months, these tests might have had windows too small for adequate detection of heavy drinking between follow-ups in

this study.

- The current study provides information about relapse to heavy drinking, but does not tell us whether these biomarkers are effective predictors of DUI recidivism.

Discussion

Biomarker testing has been a reliable diagnostic tool in many European countries. This strategy also might be useful to incorporate into US DUI intervention programs. This study is the first in the US to measure relapse rates among DUI offenders using objective measures during follow-up. Figure 1 presents results that suggest baseline biomarkers might be important predictors of risk for continued heavy drinking, which in turn, might be associated with DUI recidivism. Expanded follow-up studies, such as a comparative exploration of various cutoff points for heavy drinking, might strengthen the efficacy of these measures within heterogeneous DUI populations. Such improvements might support the use of biomarker tests in the development of individualized driver safety plans.

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What do you think? Please use the comment link below to provide feedback on this article.

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