

# The Impact of Alcohol Dependence and Consumption on Depressive Symptoms in HIV-Infected Patients

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# Alcohol and Depression—A Systematic Review

(Sullivan et al, The American Journal of Medicine. 2005)

- Alcohol problems are common in patients with major depression
- Randomized clinical trial data supported the effectiveness of antidepressants in depressed patients with alcohol dependence
- Observational studies reported that alcohol problems are associated with a number of adverse clinical and health care outcomes
- Majority of the data came from psychiatric and inpatient settings and focused on alcohol abuse and dependence
- The current literature focusing on outcomes was of limited quality
- These studies did not include HIV-infected patients

# Alcohol and Depression in HIV

- The lifetime prevalence of an alcohol use disorder = 26-60% in people living with HIV/AIDS as compared with 14% to 24% in the general population
- In a national sample of patients with HIV, 8-12% were classified as heavy drinkers, a rate approximately twice that of the U.S. national average
- Depressive symptoms are common in HIV-infected patients with studies revealing a lifetime prevalence of depression in patients with HIV ranging from 22-45%

# Alcohol and Depression in HIV

- Both alcohol problems and depressive symptoms have a substantial impact on HIV outcomes
- Alcohol problems have been associated with:
  - Receipt of HIV treatment of poorer quality
  - A delay in seeking HIV treatment
  - Poor adherence to highly active antiretroviral therapy (HAART)
  - Worse treatment response with more rapid HIV disease progression as evidenced by lower CD4 lymphocyte counts and higher HIV RNA
  - An increase in sexual risk behaviors (e.g. sexual intercourse without condom use, multiple sexual partners).
- Similarly, depressive symptoms have a multifactorial effect on HIV including:
  - Increasing the level of immunosuppression
  - Biochemical alterations
  - Effects on medication adherence

# Purpose

- Research to date has not examined the impact of current alcohol dependence and varying levels of alcohol consumption on depressive symptoms in HIV-infected patients
- To determine the impact of current alcohol dependence and current alcohol consumption on depressive symptoms in HIV-infected patients with past or current alcohol problems

# Subjects

- Subjects:
  - Prospective cohort of HIV-infected adults
  - Enrolled in the NIAAA-funded HIV-LIVE (HIV-Longitudinal Interrelationships of Viruses and Ethanol) Study
  - Current or past alcohol problems (defined as  $\geq 2$  out of a possible 4 positive responses to the CAGE alcohol screening questionnaire)

# HIV-LIVE

- Boston-based cohort formed between August 2001 to July 2003
- 400 HIV–LIVE participants were enrolled from four different sources:
  - Cohort of HIV-infected participants with alcohol problems
  - Boston Medical Center's Diagnostic Evaluation Unit, an intake clinic for HIV-infected patients
  - Beth Israel Deaconess Medical Center primary care and specialty clinics;
  - Other local healthcare sites or shelters in the Boston area

# HIV-LIVE

- Eligibility criteria:
  - HIV antibody test positive by enzyme-linked immunosorbent assay and confirmed by Western blot;
  - Two or more affirmative responses to the CAGE alcohol screening questionnaire or
  - Physician-investigator diagnosis of alcoholism
  - Ability to speak English or Spanish
  - At least one contact person who was likely to know the subject's whereabouts
  - Folstein Mini-Mental State Examination greater than 21
  - Trained interviewer assessed that the patient was capable of comprehending the informed consent and of answering interview questions

# Definitions

- Alcohol-related Definitions:
  - Current alcohol dependence
    - Assessed using the reference standard Composite International Diagnostic Interview
  - Past month consumption
    - Heavy drinking - >4 drinks on one day or >14 drinks per week  
for men; >3 or >7, respectively for women
    - Not heavy drinking - None or moderate amounts
    - Validated calendar-based method\*

\*Sobell et al. Alcohol timeline followback (TFLB). In: American Psychiatric Association (ed.). Handbook of Psychiatric Measures. Washington, DC: American Psychiatric Association, 1996, 477-9.

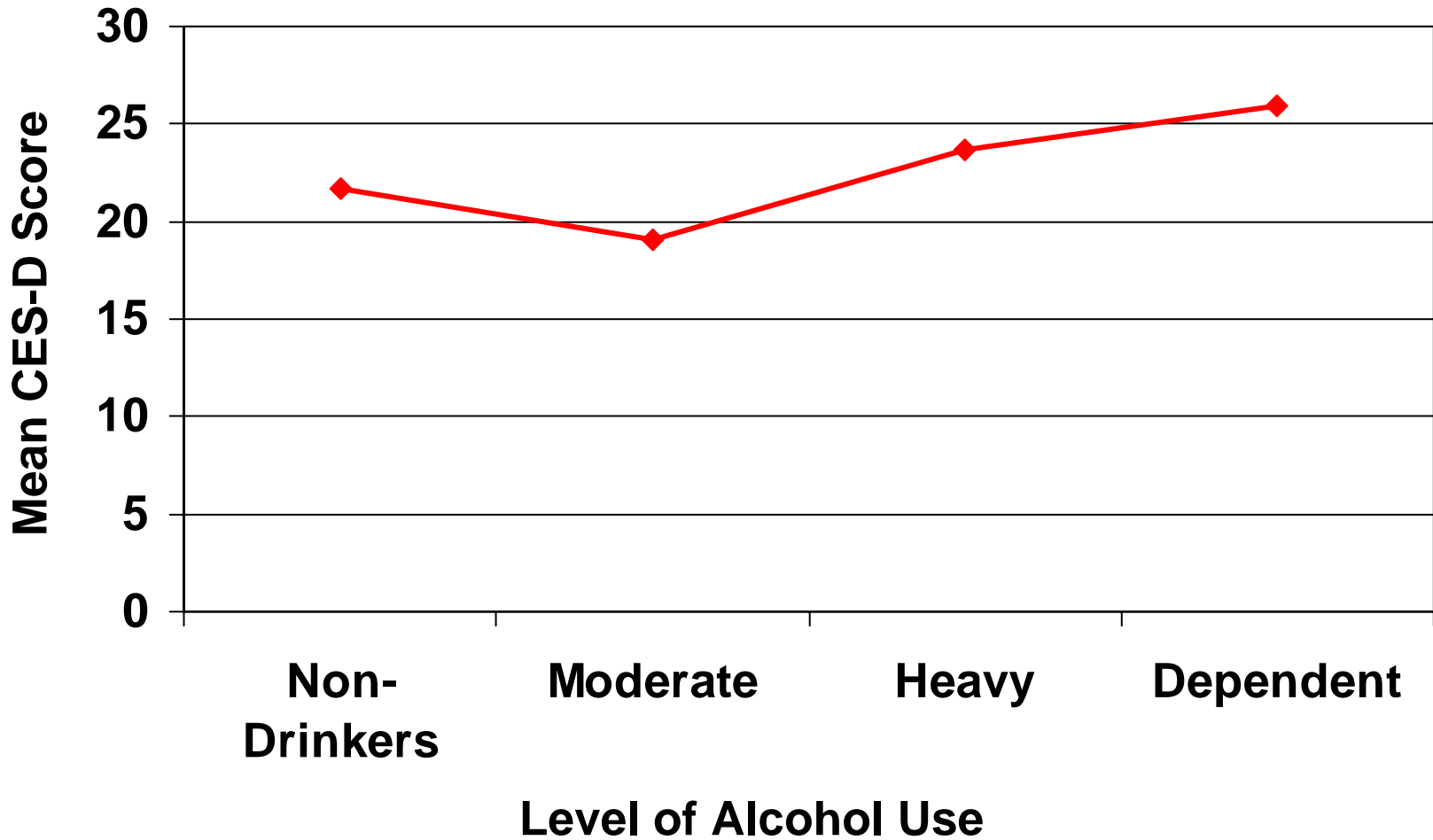
# Analysis

- Dependent variable - current depressive symptoms as measured by the Center for Epidemiologic Studies Depression Scale (CES-D) [range 0-60]. A score of  $\geq 16$  is interpreted as being suggestive of current depressive symptoms
- Main independent variables - current alcohol dependence and current alcohol consumption - assessed in separate models
- Data were collected at 6-month intervals (2001-2005)
- Longitudinal regression models controlled for the following variables:
  - Gender
  - Age
  - Race/Ethnicity
  - Homelessness
  - Hepatitis C (HCV) antibody (Ab) status
  - Medical comorbidities
  - Current illicit drug use
  - HIV log RNA
  - CD4 cell count
  - Antiretroviral medication adherence
  - Time since study enrollment

# Baseline Characteristics of Cohort of HIV-Infected Patients with Past or Current Alcohol Problems

Characteristic	N=400
Age, mean (SD) (range)	43 (7.4) (21-71)
Male, % (n/N)	75% (299)
Race/Ethnicity, % (n)	
Black	41% (166)
White	33% (131)
Hispanic	19% (76)
Other	7% (28)
Homelessness, % (n)	25% (100)
Hepatitis C antibody positive, % (n)	59% (232/396)
Current illicit drug use, % (n)	64% (257)
Alcohol dependence, % (n)	10% (40)
Alcohol consumption, % (n)	
None	58% (231)
Moderate	11% (43)
Heavy	31% (125)
CES-D score, mean (SD) (range)	22.1 (12.9) (0-56)
Antiretroviral medication adherence, % (n)	
Adherent	46% (186)
Not adherent	16% (62)
Not on medication	38% (152)
CD4 count, mean (SD) (range)	455 (299) (8-1809)
HIV log RNA, mean (SD) (range)	2.98 (1.35) (1.4-5.88)

# Level of Alcohol Use and CES-D



# Impact of Current Alcohol Dependence on Depressive Symptoms

	Alcohol Dependent	Not Alcohol Dependent	P-value
<b>Unadjusted Mean Depressive Symptoms (SE)*</b>	<b>24.5 (0.93)</b>	<b>21 (0.57)</b>	<b>&lt;0.0001</b>
<b>Adjusted Mean Depressive Symptoms (SE)**</b>	<b>24.5 (1.05)</b>	<b>21 (0.77)</b>	<b>&lt;0.0001</b>

\*Analyses based on 400 subjects contributing 1,721 observations

\*\*Analyses based on 391 subjects contributing 1,509 observations

# Impact of Current Heavy Drinking on Depressive Symptoms

	Heavy Drinking	Not Heavy Drinking	P-value
<b>Unadjusted Mean Depressive Symptoms (SE)*</b>	<b>22.7 (0.75)</b>	<b>21 (0.58)</b>	<b>0.005</b>
Adjusted Mean Depressive Symptoms (SE)**	22.4 (0.90)	21.4 (0.77)	0.11

\*Analyses based on 400 subjects contributing to 1,726 observations

\*\*Analyses based on 391 subjects contributing to 1,514 observations

# Impact of Current Alcohol Dependence and Covariates on Depressive Symptoms

Characteristic	Adjusted Mean Difference in Depressive Symptoms (SE)	P-value
<b>Currently Alcohol Dependent</b>	<b>3.49 (0.88)</b>	<b>&lt;0.0001</b>
Female	2.36 (1.34)	0.08
Age	-0.03 (0.08)	0.73
<b>Black Race</b>	<b>-2.52 (1.14)</b>	<b>0.03</b>
Homelessness	1.43 (1.29)	0.27
<b>HCV Ab Positive</b>	<b>4.6 (1.17)</b>	<b>&lt;0.0001</b>
Katz Medical Comorbidity	0.05 (0.18)	0.78
<b>Current Illicit Drug Use</b>	<b>1.71 (0.63)</b>	<b>0.006</b>
HIV Log RNA	0.41 (0.28)	0.15
CD4 Cell Count	-0.002 (0.001)	0.13
<b>Adherent to Antiretroviral Medication</b>	<b>-1.76 (0.88)</b>	<b>0.04</b>

# Summary

- There is evidence of a “J-curve” relationship between level of alcohol use and depressive symptoms (CES-D scores)
- Current alcohol dependence and heavy drinking were significantly associated with more depressive symptoms in unadjusted models.
- In adjusted analyses, the association of current alcohol dependence persisted, while the effect of current heavy drinking diminished and was no longer statistically significant.

# Summary

- Patients with alcohol dependence
  - Exhibited significantly higher CES-D scores (all p-values  $<0.01$ ), if they were:
    - HCV Ab-positive
    - Currently using illicit drugs
  - Exhibited significantly lower CES-D scores (all p-values  $<0.05$ ), if they were:
    - Black
    - Adherent to antiretroviral medications

# Conclusions

- Current alcohol dependence, but not current heavy drinking, was independently associated with more depressive symptoms in HIV-infected patients with past or current alcohol problems.
- There are additional factors in alcohol dependent patients that mediate whether they have more or less depressive symptoms.

# Future Directions

- Plan to evaluate this association further with the Veteran's Aging Cohort Study (VACS):
  - A prospective, observational cohort study of 6000 HIV-positive and an age/race/site matched control group of HIV-negative veterans in care at eight VA medical centers around the country:
    - Atlanta, Baltimore, Bronx, Houston, Los Angeles, Manhattan/Brooklyn, Pittsburgh, and Washington, D.C.
- Primarily funded by the National Institute on Alcoholism and Alcohol Abuse, National Institutes of Health

# Future Directions

- Evaluation in VACS would further allow for a comparison of this association in HIV-infected and non-infected patients
- Intervention study focusing on treating alcohol dependence and heavy drinking in HIV-infected patients and evaluate the outcomes including depressive symptoms