

Further Validation of the Alcohol Dependence Scale (ADS) as an Index of Severity

Andrew. J. Saxon^{1,2,3}, Daniel R. Kivlahan^{1,2,3}, Dennis M. Donovan^{3,4}

¹VA Puget Sound Health Care System ²Center of Excellence in Substance Abuse Treatment and Education, University of Washington ³Department of Psychiatry & Behavioral Sciences and ⁴Alcohol and Drug Abuse Institute

ABSTRACT

We report a cohort analysis to replicate the concurrent validity of the quartiles of Alcohol Dependence Scale (ADS) scores as an index of problem severity and evaluate the screening performance of the ADS using criteria for DSM-IV physiological alcohol dependence as the "gold standard." Participants were outpatients randomized in the COMBINE study (N=1372). MANCOVA controlling for age showed overall mean differences between quartiles on concurrent validity measures with significant univariate linear trends on the DrInC, OCDS, AASE Temptation and Confidence, and Form 90 drinking measures over the prior 30 days (drinks per drinking day, percent days abstinent, total drinks), but not GGT. ROC analysis showed modest performance of total ADS score to detect physiological alcohol dependence based on the SCID with no difference by gender. The ADS provides an efficient self-report measure of alcohol dependence severity, but it did not adequately distinguish the minority of patients in this large outpatient sample (18.3%) who did not meet criteria for physiological dependence.

BACKGROUND

The Alcohol Dependence Scale (ADS; Skinner and Allen, 1982) was designed as a self-report measure that could quantify the severity of the syndrome that includes impaired control over alcohol, alcohol seeking behavior, tolerance, withdrawal, and awareness of a compulsion to consume alcohol.

Several studies on the ADS have examined its factor structure, predictive validity, and concurrent validity of the quartiles from the original distribution of scores (n=225) to reflect problem severity (Skinner and Allen, 1982; Kivlahan et al., 1989; Ross et al., 1990; Allen et al., 1994; Willenbring and Bielinski, 1994).

OBJECTIVE

This study is the first to evaluate the screening performance of the ADS using criteria for DSM-IV physiological alcohol dependence as the "gold standard." We also used a much larger sample to replicate the concurrent validity of the quartiles of ADS scores to reflect increasing problem severity.

METHODS

Participants

Randomized patients (N=1372) in the COMBINE Study, an 11 site trial of 2 pharmacotherapies (acamprosate and naltrexone) and 2 behavioral interventions (COMBINE Behavioral Intervention and Medical Management) for individuals seeking outpatient treatment for alcohol dependence.

Exclusion criteria

- Psychiatric disorders requiring pharmacotherapy
- Substance dependence other than cannabis, nicotine or alcohol
- Transaminases > 3 times the upper limit of normal

Baseline Battery

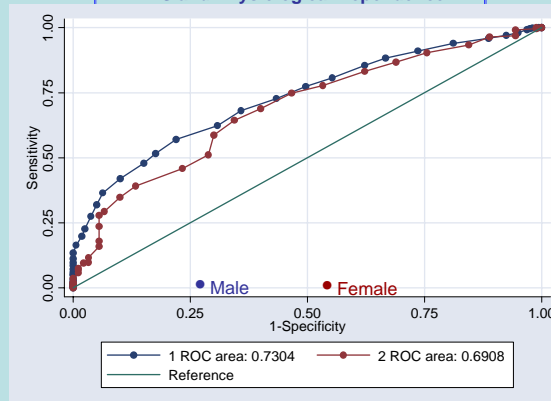
- Alcohol Dependence Scale (ADS)
- Form 90 timeline followback interview
- Structured Clinical Interview for DSM-IV Disorders (SCID) (alcohol use module)
- Drinkers' Inventory of Consequences (DrInC)
- Alcohol Abstinence Self-Efficacy Scale (AASE)
- Obsessive-Compulsive Drinking Scale (OCDS)
- Gamma Glutamyltransferase (GGT)

Analyses

- MANCOVA (controlling for age) compared mean differences between quartiles on concurrent validity measures.
- Area under the receiver operating characteristic (AUROC) analyses were used to compare gender differences in the sensitivity and specificity of the ADS to detect physiological alcohol dependence (i.e. tolerance and/or withdrawal) based on DSM-IV criteria from the SCID

This research was supported in part by grant U10-AA11799 from the National Institute on Alcohol Abuse and Alcoholism

Receiver Operating Characteristic (AUROC) ADS and Physiological Dependence



Percent of Subjects Within Each ADS Quartile Positive for Physiological Dependence

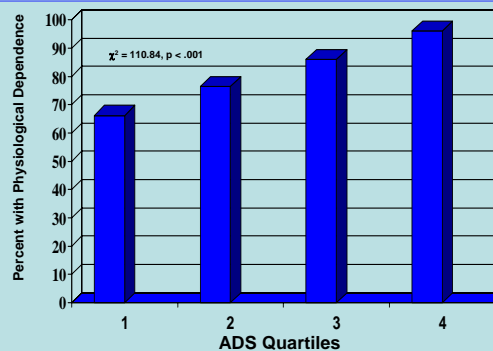


Table 1: Participant Characteristics Across Quartiles

	ADS Quartiles				F
	1 0-11 (N=313)	2 12-16 (N=354)	3 17-21 (N=343)	4 22-46 (N=362)	
	Means				
Age	49.0	45.6	42.5	41.7	37.50*
Years of Education	15.3	14.9	14.3	13.8	18.85*
	Percentages				χ^2
Male	70.9%	68.4%	65.0%	71.3%	4.01
Non-Hispanic White	78.0%	79.9%	76.3%	72.7%	5.78
Married/Cohabiting	51.8%	52.3%	43.4%	32.3%	37.16*
Employment Full Time	65.8%	66.8%	62.5%	49.2%	29.61*
Prior Alcohol Treatment	71.7%	60.2%	42.3%	32.0%	126.66*
Physiological Dependence	66.2%	76.5%	86.0%	96.1%	110.84*

*p<.001

RESULTS

- Participants differed significantly across ADS quartiles in several important baseline demographic characteristics
- ADS quartiles showed a significant relationship with:
 - Drinking patterns in the last 30 days (Form 90)
 - Drinks per drinking day
 - Total number of standard drinks
 - DrInC
 - OCDS
 - AASE temptation and confidence scores
- ADS quartiles showed no significant association with:
 - GGT
 - Percent days heavy drinking
- The AUROC did not differ significantly between males (.73, 95% CI = .69-.77) and females (.69, 95% CI = .63-.75), indicating no reliable difference in detecting physiological dependence, though both were modestly better than chance

Table 2: ADS Quartiles Compared on Alcohol Consumption, Biomarker, and Assessment Variables

	Quartile 1 (0-11)	Quartile 2 (12-16)	Quartile 3 (17-21)	Quartile 4 (22-46)	F
	Mean	Mean	Mean	Mean	
Drinks per Drinking Day	8.9	10.4	13.1	17.1	82.4*
Total Std. Drinks	221	237	283	350	33.3*
% Heavy Drinking Days	64.6	66.7	65.4	65.7	0.31
GGT	67.8	69.8	69.0	88.1	2.12
DrInC Total Score	31.1	41.4	51.4	64.1	249.4*
AASE Confidence Score	2.8	2.6	2.6	2.5	14.7*
AASE Temptation Score	2.8	3.0	3.2	3.4	36.5*
OCDS Total Score	21.7	24.5	27.8	32.0	127.5*

*p<.001

LIMITATIONS

- This work may have limited generalizability because the inclusion and exclusion criteria eliminated some alcohol dependent individuals from participation.
- Although trained staff interviewed participants with the SCID for DSM-IV alcohol dependence, the study did not include reliability checks on these interviews

SUMMARY

- This study partially supports the findings of Skinner et al. (1982) that ADS quartiles delineate groups of alcohol dependent individuals who differ in some clinically meaningful ways.
- ADS quartiles did not appear to have any specific relationship with binge alcohol consumption or the biomarker of alcohol consumption, GGT.
- The ADS quartiles do in general reflect a significant, though not always a linear, relationship with other measures of alcohol problems including life consequences of excessive alcohol use, self-efficacy, and alcohol craving.
- The ADS would not serve as a good screening instrument for DSM-IV defined physiologic alcohol dependence.
- The ADS and DSM-IV criteria for physiologic dependence appear to be tapping somewhat different constructs.
- Alcohol dependence, with its plethora of physiologic, psychological, behavioral, and social components, is an exceedingly complex disorder not readily amenable to thorough measurement or characterization by a single, simple instrument.