Under-diagnosis of comorbid mental illness in repeated DUI offenders mandated to treatment

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Abstract

Repeated offenders for driving under the influence (DUI) offenders are routinely mandated to alcohol treatment. These individuals have been shown to have high rates of co-occurring psychiatric disorders, which can be important for the conduct and outcomes of alcohol treatment. The extent to which treatment providers are aware of these disorders and modify treatment accordingly is unknown. As part of a larger study to investigate the impact of sanction conditions on probation outcomes, we screened 233 subjects for psychiatric conditions and compared those findings to the psychiatric conditions identified during mandatory treatment by independent treatment providers. Adjusted rates of under-diagnosis were commonly high: 97.2% of bipolar, 67.5% of major depression, 100% of obsessive-compulsive, and 37.3% of drug use disorders remained undiagnosed during treatment. Rates of over-diagnosis were low for all disorders, with the exception of drug use disorders. These rates of under-diagnosis represent missed opportunities to improve treatment outcomes among repeat DUI offenders.

Keywords

DUI/DWI; psychiatric comorbidity; treatment; under-diagnosis

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1. Introduction

Psychiatric disorders commonly co-occur among individuals with alcohol use disorders (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). Although uncertainty about the order of precedence among comorbid conditions is considerable (Shivani, Goldsmith, & Anthenelli, 2002), symptoms of mental illness can exacerbate and be exacerbated by alcohol abuse and dependence (Ziedonis, Steinberg, Smelson, & Wyatt, 2003).

Alcoholics with comorbid psychiatric conditions are at increased risk of relapse compared to alcoholics without co-occurring conditions (Daley & Marlatt, 2005). Several reasons for this have been identified, including 1) poor treatment compliance because psychiatric disorders interfere with motivation to follow pharmacological and cognitive-behavioral therapies (Petrakis, Gonzalez, Rosenheck, & Krystal, 2002); 2) continued self-medication of the untreated symptoms of the co-occurring mental illness with alcohol (Nitenson & Gastfriend, 2003); 3) poor ability to absorb skills imparted during psychosocial therapy, which requires a minimum level of "attention, memory, and reality awareness" on the part of the patient (Ziedonis et al., 2003); and 4) exacerbation of undiagnosed psychiatric conditions during therapy, e.g., the confrontational method inappropriately applied to patients suffering from anxiety disorders (Petrakis et al., 2002). Accordingly, mental health professionals working in addiction medicine generally agree that treatment for alcohol use disorders must also include co-occurring psychiatric disorders.

Repeat driving under the influence (DUI) offenders are an important target population for alcoholism treatment since approximately one-third of repeat offenders will repeat this hazardous behavior (National Highway Traffic Safety Administration, 2003). Furthermore, this population is at great risk of co-occurring psychiatric disorders, with estimates ranging from 33% to 65% of lifetime psychiatric disorders comorbid with alcohol use disorders for men, and 50% to 79.7% for women (Lapham et al., 2001; Lapham, Kapitula, C'de Baca, & McMillan, 2006). Recognizing the tremendous negative personal and public health consequences of relapse among repeat DUI offenders, this population is commonly mandated to alcoholism treatment when convicted (Dill & Wells-Parker, 2006).

In accordance with recommendations from mental health professionals, repeat DUI offenders also should be treated for comorbid conditions, or at least have these conditions diagnosed so that optimal treatment programs can be developed. To date, actual clinical practice in this population has not been assessed. The goal of this study was to evaluate the extent to which repeat DUI offenders adjudicated in a novel DUI court serving Multnomah County, Oregon, are correctly diagnosed with comorbid psychiatric disorders during mandatory treatment.

2. Materials and methods

2.1. Sample

The study population consisted of repeat DUI offenders recruited into a randomized sanctions study to evaluate the impacts of electronic monitoring and mandatory vehicle sales on post-conviction recidivism rates (Lapham et al., 2006). Subjects participated in the Driving under the influence of intoxicants Intensive Supervision Program (DISP), implemented in the Multnomah County Circuit Court, Portland, Oregon, to reduce DUI recidivism through treatment, sanctions for non-compliance with probation, and intensive participation in the recovery process on the part of the presiding judge and staff. DISP is a voluntary program and has effectively reduced DUI recidivism, driving with a suspended or revoked license, and post-conviction crash rates (Lapham et al., 2006). Study subjects were recruited from the DISP during plea hearings where the objectives of the parent study and signed informed consent were explained. Between April 10, 2001, and October 8, 2003, 477 subjects were recruited

into this study and sentenced into the DISP. To assess the generalizability of our study sample to the general, repeat DUI population, we compared the 477 subjects recruited into our study to all 493 repeat DUI offenders convicted in Multnomah County courts during the study period who did not enroll in DISP. We also compared the study subjects to 52 DISP defendants who elected not to participate in the study. Results have been described elsewhere (Lapham et al., 2006). There was no statistically significant difference across these groups in age, gender, prior motor vehicle accidents, prior DUI arrests, and prior traffic convictions. Non-study subjects enrolled in the DISP were similarly distributed across ethnic groups as the study participants.

2.2. Measures

After pleading guilty to DUI, the offender was taken to an off-site interview facility where a battery of surveys was administered, including the Composite International Diagnostic Interview (CIDI) (Robins et al., 1988; Robins, Helzer, Ratcliff, & Seyfried, 1982; Wittchen, 1994), which was used for diagnosing mental health disorders in the study population. The CIDI was initially written at the request of the World Health Organization and the U.S. Mental Health Administration to estimate prevalence rates of specific psychiatric disorders. The CIDI was designed to be easily understood, highly structured, and appropriate for use by non-clinician interviewers. The fully scripted and close-ended questions were designed to be appropriate for people with an 8th grade reading level. The version used, the 10th revision, provided the Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (DSM-IV); (American Psychiatric Association, 1994) diagnoses based on an individual's responses. To ensure standardization, the computerized version (2.1) was used (World Health Organization 1997). The CIDI assesses lifetime alcohol and drug abuse, and dependence; depressive disorders and dysthymic disorder; manic and bipolar affective disorder; and obsessive-compulsive disorder (OCD). If any of these disorders was ascertained to have occurred during the subject's lifetime, the age of onset and age at last symptom were obtained. Symptoms reported to have occurred within 1 year of the baseline interview for any lifetime diagnosis gave the subject a positive 12-month diagnosis. Twelve-month prevalence is defined as the percentage of subjects who report having symptoms of the disorder within 12 months prior to the interview.

During the baseline interview, 459 subjects completed valid CIDI diagnoses. Prevalence of various psychiatric disorders for the 459 subjects has been reported (Lapham et al., 2006).

We conducted a systematic review of the mandatory alcohol treatment of 233 DISP subjects recruited into our study. Seven licensed facilities that treated the largest number of patients allowed our staff to access medical records of the study participants. Clinicians in each treatment center were unaware of the CIDI results. Chart reviews documented intake and discharge drug and alcohol diagnoses; treatment venues ordered and received; group and individual psychotherapy participation; results of urine tests; alcohol use severity at intake and discharge; compliance ratings; and reasons for non-compliance, prognosis, and payment liability. The chart review also documented psychiatric comorbidity identified at any time during the treatment process, including drug abuse or dependence, bipolar disorder, depression, or OCD. The instrument used during the chart review was the Treatment Abstraction Form (TAB), developed by David S. Timken, Ph.D., to gather data from the treatment charts of persons convicted of DUI and sentenced to alcohol and/or drug abuse treatment (Timken, 2001). Data obtained include co-morbid disorders, along with other treatment conditions and outcomes depending on the treatment regimen prescribed. The review collected data on the presence / absence of any drug abuse or dependence disorder, Bipolar I or II, any depression, or OCD during treatment. These diagnoses were compared to the 12-month diagnoses ascertained by the CIDI interview to determine if clinicians correctly identified comorbid psychiatric disorders.

2.3. Analytical Methods

We computed the rates of under- and over-diagnosis to evaluate the clinic diagnoses with respect to the CIDI diagnoses. Rates of over-diagnosis are defined as the number of subjects diagnosed with a particular disorder during treatment divided by the total number of CIDI negative subjects. This is equivalent to false-positive rates computed in diagnostic test evaluation. The proportion of correct negatives is equal to one minus this quantity. Rates of under-diagnosis are defined as the number of subjects NOT diagnosed with a particular disorder while in alcohol treatment divided by the total number of CIDI positive subjects. This is equivalent to the false-negative rate computed in diagnostic test evaluation. The proportion of correct positives is equal to one minus this quantity.

Exploratory analyses revealed considerable variability in the rates of over- and under-diagnosis among the seven participating clinics. Rates were therefore biased toward the clinics with the largest patient pools, and confidence intervals for the estimated rates were too small. We therefore fit Bayesian random effects logistic regression models to provide valid estimates of the population over- and under-diagnosis rates. The random, clinic-level effects were assumed to follow a normal distribution with unknown variance, and mean equal to the logit population over- or under-reporting rates. Furthermore, rates of over- and under-diagnosis were clearly correlated across disorders. For example, a clinic with a high rate of under-diagnosis of drug use disorders was also likely to have high rates of under-diagnosis of depression. Accordingly, we allowed the clinic-level random effects to be correlated across disorders and over- / under-diagnosis rates in the Bayesian model specification. Further technical details are available from the authors on request.

Adjusted rates of over- / under-diagnosis correspond to the estimated diagnostic accuracy for the population of treatment centers accepting DUI offenders in their treatment pool. Bayesian 95% credible intervals for the rates of over- and under-diagnosis were computed from the model results, corresponding to the interval within which we were 95% certain the true rates lie. All posterior inferences for the adjusted under / over-diagnosis rates are in terms of the posterior median and 2.5- and 97.5-percentiles for the lower and upper confidence limits.

How many untreated mentally ill patients will go through a clinic before one is diagnosed and presumably treated? This question is a significant one to clinical directors for making policy changes in screening, diagnosis, and assessment procedures. Using the results of this Bayesian analysis, we estimated the average number of mentally ill but undiagnosed DUI offenders going through a clinic before a patient with a comorbid disorder was correctly identified. These estimates correspond to actual missed opportunities for treatment in a clinic that treats this particular patient population. These missed diagnoses are simulated from a geometric probability distribution with probability equal to one minus the under-diagnosis rates. In Bayesian terms, these rates correspond to the posterior predictive distribution of patients with a comorbid disorder that pass through a clinic before an illness is diagnosed.

2.4. Computational Methods

All data were managed using SAS software, version 9.1.3. The Bayesian random effects logistic regression models were fit using WinBUGS software, v 1.4.1.

3. Results

Most (86%) of the study subjects were males and the average age was 38.5 years (standard deviation = 10.9). Most subjects identified themselves as non-Hispanic whites (72%), followed by Hispanic (16%), African American (6%), Native American (4%), and Asian (2%). The

average number of DUI convictions in the last 10 years for this sample was 2.4 convictions (standard deviation =0.8).

The lifetime and 12-month prevalences of each disorder for the full sample have been published elsewhere (Lapham et al., 2006). The 12-month prevalence rates in the sample described in Table 1 are virtually identical to those observed for the full sample (Table 1). Depression was the most common disorder (24.5% of the sample), followed by drug use disorders (10.7%), bipolar disorders (6.0%), and OCD (2.6%).

Rates of under-diagnosis were very high in this sample; 92.9% (97.2% adjusted) of subjects with symptoms of bipolar disorder, 68.4% (67.5% adjusted) of subjects with depression, and 100.0% of subjects with OCD went undiagnosed for these disorders during treatment. Credible intervals for these disorders were also relatively wide, with no fewer than 75.3% of bipolar patients and 37.6% of depressed patients not being diagnosed as such. Rates of under-diagnosis for drug use disorders were considerably lower in this sample; 40% of subjects (37.3% adjusted) with a drug use disorder according to the CIDI were not recognized as such during treatment. The lower credible limit for the population drug use disorder under-diagnosis rate is relatively modest at 10.2%.

Rates of over-diagnosis were low in this sample for bipolar (0.5% over-diagnoses), depression (3.4%), and OCD (0.0%) disorders considered in this study. Adjusted rates of over-diagnosis corresponded to the unadjusted rates, although were slightly lower. The credible intervals for these disorders were narrow, indicating a 95% certainty that fewer than 1.6% (bipolar disorder) and 8.3% (depression) of healthy subjects were mistakenly diagnosed with these disorders. Rates of over-diagnosis were substantially higher for drug use disorders. About 24.6% (adjusted) of defendants who were not identified as having a drug use disorder on the CIDI were diagnosed as such during treatment. The corresponding credible interval was relatively wide, indicating that the true over-diagnosis rate for drug use disorders was between 13.6% and 43.4%.

The analysis in Table 1 was used to predict the average number of untreated mentally ill patients passing through a clinic before the next patient was correctly diagnosed. Means of the posterior predictive distribution for each illness were 180.9 bipolar patients missed, 3.6 depressed patients missed, and 1.7 patients with a drug use disorder missed in a clinic before a patient was accurately diagnosed.

4. Discussion

Our analysis of the medical charts of 233 repeat DUI offenders mandated to treatment indicates that rates of under-diagnosis for co-morbid psychiatric disorders are very high. Defendants suffering from psychiatric conditions plus alcohol use disorders are therefore not being correctly identified as having more than one psychiatric disorder, and treatment providers are not developing treatment protocols sensitive to these conditions. These missed opportunities may result in increased rates of relapse and recidivism due to poor treatment compliance, reduced assimilation of psycho-social skills imparted during treatment, and increased need to take sedatives, such as alcohol, to self-medicate symptoms of their psychiatric conditions. Relapse may result in greater risks of repeat DUI, and the personal and public health consequences of that behavior.

This analysis found relatively low rates of over-diagnosis. This is not surprising and most likely indicates that the co-morbid conditions are not being assessed for at all. This is a conceivably positive observation, particularly if treatments are costly, time consuming, and distressful to the defendants. To our knowledge, this potential benefit relative to the costs of untreated co-morbid conditions due to under-diagnosis has not been explored.

Rates of over-diagnosis are higher and rates of under-diagnosis are lower for drug use disorders compared to bipolar disorder, depression, and OCD. This suggests that clinicians have a much greater sensitivity to co-morbid drug use in the DUI population in these settings. Drug use disorders are likely to be a commonly screened condition among persons diagnosed with alcohol abuse / dependence as well as DUI offenders because many commonly used screening and assessment tools routinely screen for alcohol and other drugs. Few instruments, however, routinely screen for other psychiatric disorders (Timken & Wanberg, 2006).

The seven clinics observed in this study cover the spectrum of drug and alcohol treatment programs used in this country. Most of the study subjects attended publicly funded, stand-alone clinics who receive much of their funding through state contracts with corrections and DUI programs. These providers generally employ master's level counselors and licensed social workers to assess and treat clients. Other providers were treatment centers affiliated with hospitals or health maintenance organizations. While one might expect a more highly integrated information-sharing system within these larger providers, it isn't clear the extent to which detailed psychiatric diagnostic information is shared across centers and medical staff. Even so, we found no clear pattern of greater or lower rates of under-diagnosis between these types of providers. This is clearly an avenue for important future research on treatment for alcohol use disorders to determine what provider characteristics promote more effect assessment for psychiatric comorbidity.

4.1. Limitations

One may be concerned about accepting the CIDI as a "gold standard" that accurately diagnoses mental health disorders. Interestingly, tests of the specificity and sensitivity of the CIDI are limited apparently due to disagreement over what truly constitutes a gold standard against which the CIDI can be compared (Peters & Andrews, 1995; Wittchen, 1994). An early version of the CIDI was compared to multi-component clinician diagnoses. Findings indicated that OCD and major depressive disorders had high sensitivity (94% and 92%, respectively) and high specificity (99% and 69%, respectively) using DSM-III-R criteria (Peters et al., 1995). Recently, the World Mental Health Survey Initiative version of the World Mental Health Organization CIDI (WMH-CIDI) was compared to blinded clinical diagnoses in a sample of the National Comorbidity Survey Replication (Kessler et al., 2005). The WMH-CIDI, a derivation of the CIDI used in our study, was found to have good sensitivity for anxiety disorders (54.4%), major depressive disorders (55.3%), and drug abuse (53.7%). Drug dependence diagnoses using WMH-CIDI had relatively low sensitivity (25.0%), which Hassin and others (2005) have noted is a result of using drug abuse as a screening criteria in the WMH-CIDI. All diagnoses from the WMH-CIDI had very high levels of specificity (90% and greater) for all disorders. The validity of any version of the CIDI has not been assessed in repeat DUI populations or alcoholics in general. The accuracy of the CIDI is commonly used as a gold standard for assessing screening practices in, for example, primary care settings (Aertgeerts, Buntinx, Ansoms, & Fevery, 2001; Nuyen et al., 2005). While the WMH-CIDI looks promising, it is important for future efforts not only to conduct research on it with DUI offenders, but to look at other instrumentation that may better address the identification of comorbid conditions of the DUI population(s).

4.2. Conclusions

Repeat DUI offenders are at high risk of co-occurring psychiatric disorders (Lapham et al., 2001; Lapham et al., 2006), and psychiatric comorbidity has a negative impact on the course, treatment outcome, and prognosis of both syndromes (Regier et al., 1990). Additionally, many persons providing DUI screening, assessment, and treatment services have not been adequately trained in the areas of co-occurring disorders, and this compounds the problem (Cavaiola & Wuth, 2002). This result is shown in our analysis of a sample of 233 repeat DUI offenders,

where comorbid bipolar, depression, OCD, and drug use disorders were commonly undiagnosed during treatment. Under-diagnosis of comorbid psychiatric conditions during mandatory alcohol use treatment represents a missed opportunity to improve outcomes for this patient population. While further research is recommended, it is obvious that improved methods for identifying and treating DUI offenders with comorbid conditions are needed.

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Table 1

Rates of over- and under-diagnosis of comorbid psychiatric disorders among 233 repeat DUI offenders undergoing mandatory alcohol-use treatment.

	CIDI				Clinic							
	12-month Negatives		12-month Positives		Correct Negatives		Correct Positives		Over-Diagnoses		Under-Diagnoses	
	N	%	N	%	N	%	N	%	N	%	N	%
Bipolar Adj. %[a]	219	94.0	14	6.0	218	99.5	1	7.1	1	0.5 0.2 (0.0 – 1.6)[b]	13	92.9 97.2 (75.3 – 99.9)
Depression Adj. %	176	75.5	57	24.5	170	96.6	18	31.6	6	3.4 3.0 (0.7 – 8.3)	39	68.4 67.5 (37.6 – 84.8)
OCD Adj. %*	227	97.4	6	2.6	227	100.0	0.0	0.0	0	0.0 *[c]	6	100.0 *
Any Drug Adj. %	208	89.3	25	10.7	160	76.9	15	60.0	48	23.1 24.6 (13.6 – 43.4)	10	40.0 37.3 (10.2 – 68.4)

[a] Adj. % = Posterior median over- and under-diagnosis rates adjusting for variability among clinics using Bayesian random effects logistic regression.

[b] Numbers in parentheses are 95% Bayesian credible intervals.

[c] * = Adjusted rates for OCD were not computed due to the very small number of positive diagnoses from the CIDI.