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ORIGINAL ARTICLE

Are the binary typology models of alcoholism valid in polydrug abusers?

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Objective: To evaluate the dichotomy of type I/II and type A/B alcoholism typologies in opiate-dependent patients with a comorbid alcohol dependence problem (ODP-AP).
Methods: The validity assessment process comprised the information regarding the history of alcohol use (internal validity), cognitive-behavioral variables regarding substance use (external validity), and indicators of treatment during 6-month follow-up (predictive validity).
Results: ODP-AP subjects classified as type II/B presented an early and much more severe drinking problem and a worse clinical prognosis when considering opiate treatment variables as compared with ODP-AP subjects defined as type I/A. Furthermore, type II/B patients endorse more general positive beliefs and expectancies related to the effect of alcohol and tend to drink heavily across several intra- and interpersonal situations as compared with type I/A patients.
Conclusions: These findings confirm two different forms of alcohol dependence, recognized as a low-severity/vulnerability subgroup and a high-severity/vulnerability subgroup, in an opiate-dependent population with a lifetime diagnosis of alcohol dependence.

Keywords: Alcohol abuse; outpatient psychiatry; psychosocial aspects of drug treatment; diagnosis and classification

Introduction

Social and economic crises in the European region are increasing poverty and several mental health problems, such as depression, suicide, and substance use disorders.[1] Disorders related to alcohol abuse contribute significantly to the global burden of disease in Western European society.[2] Polysubstance (ab)use is also becoming quite prevalent in mental health institutions.[3] Alcohol and drug abuse phenotypes are complex, multidimensional, and heterogeneous.[4] This heterogeneity has led to recurring attempts to classify subgroups of individuals with substance abuse – i.e., typologies. Substance abuse typologies are used to diagnose addiction disorders, provide information regarding psychological and neurobiological mechanisms, help guide therapeutic choices, and assess the effectiveness of treatment response.[5-7]

Two of the most important typological models of alcoholism are the classifications established by Cloninger et al.[8] and Babor et al.[9] Based on the genetic and environmental features of alcoholism vulnerability, Cloninger et al.[8] discriminate two subtypes of alcoholism: type I and type II. In clinical terms, type I is defined by a later onset of problem drinking and fewer alcohol-related problems. Conversely, type II alcoholics experience an early onset of problem drinking, frequent and intensive alcohol-related problems, and antisocial personality traits. Babor et al.[9] extracted a two-type solution (A/B) based on defining characteristics such as age of onset, severity of dependence, and psychopathology. Type A alcoholics experience a later onset of alcohol problems and generally have less severe alcohol dependence and coexisting psychopathology. Type B alcoholism is characterized by the presence of childhood risk factors, early onset, frequent use of drugs, and higher levels of psychiatric comorbidity. Both classifications have been satisfactorily validated,[10-13] and used beyond traditional alcohol dependence treatment samples – for instance, in racial and ethnic minorities and non-dependent community samples.[14-18] The literature shows that these binary alcoholism models have been generalized to populations with addictions other than alcoholism, namely opiate, cocaine, and marijuana abuse.[17,19-21] However, few studies have evaluated alcoholism typologies in the context of comorbid alcohol and drug dependence; "real-world" clinical studies are particularly rare. As a result, we could formulate the following research questions: Do alcoholism classification constructs remain valid in populations that present a lifetime diagnosis of alcohol dependence and a "primary" diagnosis of opiate or cocaine dependence? Additionally, how can we generalize the clinical findings achieved in alcoholism typologies studies[6] to these polydrug subtypes? For instance, results from psychosocial and pharmacological trials demonstrate that alcoholism subtype influences the benefit derived from specific alcoholism treatments.[7] In psychotherapeutic terms, less severe and better adjusted subtypes (type A/I) may benefit from a group-focused

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approach, while more severe subgroups (type B/II) may require an individualized and broader or alternative approach, emphasizing, for example, complementary cognitive-behavioral interventions for depression, anger, and assertiveness.[3] Considering medications, we now have evidence that some alcoholic subtypes obtain superior benefit from specific psychopharmacological compounds, e.g., naltrexone in Cloninger type I, sertraline in Babor type A, and acamprosate in Cloninger type II.[6]

In sum, considering the potential usefulness of alcoholism subtyping systems[22] and the current dissemination of polydrug consumption patterns among clinical substance user populations,[23] it is important to assess how the Cloninger and Babor classifications perform in other substance abuse disorders.

This study has two aims: first, to evaluate the type I/II and type A/B dichotomy in patients with a lifetime diagnosis of alcohol dependence undergoing opioid maintenance treatment (OMT); second, to assess how several key clinical and cognitive-behavioral constructs fit into these alcoholism typologies.

Methods

Design and subjects

A correlational and comparative study was designed to assess the clinical validity of the Cloninger and Babor classification schemes in polydrug abusers. A naturalistic longitudinal study (6 months) concerning routine clinical interventions was also performed to assess predictive validity. Data were collected during from 2010 to June 2013.

Study participants were recruited from the Addiction Unit of the Mental Health and Psychiatric Service of Hospital de Santa Maria, Lisbon, Portugal. All patients were drawn from the therapeutic program center and were chosen if they had a ''primary'' diagnosis of opiate dependence and a lifetime diagnosis of alcohol dependence. The standardized outpatient treatment protocol, generally based on a contingency management program, combines a pharmacological and a psychosocial intervention. In pharmacological terms, the addiction unit offers a methadone/buprenorphine maintenance treatment program as the treatment of choice for people who are heroin-dependent. The main goal is to control the symptoms of heroin withdrawal syndrome and to facilitate the patient's entry into the rehabilitation program. Patients were administered other medications only if psychiatric symptoms persisted. The main psychological treatment modality is group psychotherapy (weekly; 1 to 2 hours). Our individual and group psychotherapeutic interventions are directive with a cognitive-behavioral theoretical framework. Patients may stay in the group as long as they wish (ongoing group). In practice, the psychological intervention combines elements of psycho-education, interpersonal support, and relapse prevention.[24]

The initial sample comprised 146 opiate-dependent patients, who were screened with the Michigan Alcoholism Screening Test (MAST)[25] for a potential (lifetime) alcoholism problem. In the second moment, only patients who scored positive in the screening procedure (MAST positive, > 7) and in whom the presence of lifetime DSM-IV-TR[26] diagnoses for alcohol and drug dependence had been confirmed were eligible for study entry. Of the 146 patients enrolled, 96 scored positive on MAST. Five patients met the criteria for lifetime diagnosis of alcohol abuse and were removed from the sample. Therefore, we achieved a final sample of 91 opiate-dependent patients with a comorbid alcohol dependence problem (ODP-AP). Furthermore, to be eligible for the study, patients had to meet the following inclusion criteria: 1) at least 18 years of age; 2) be enrolled in OMT for at least 6 months; and 3) present a lifetime diagnosis of alcohol and opiate dependence. The exclusion criteria were the presence of serious physical disease, marked cognitive deficit, and psychiatric comorbidity (namely, schizophrenia and other psychotic disorders, dementia, delirium, bipolar affective disorders, and antisocial personality disorder).

Following the screening procedure, participants were assessed with a brief standardized interview that collects clinical and sociodemographic information. All subjects then completed a psychometric battery and were evaluated in a face-to-face interview and asked directly about the items that comprise the operationalized criteria described by each alcoholism typology.[5] All investigators (psychiatrist and clinical psychologist) that performed the subtyping procedure had the necessary clinical skills to assess patients with addiction and scientific knowledge to manage the principles of each classification system (for more information, see Pombo & Lesch).[22]

To accurately identify drug consumption in our sample, all patients underwent urine testing for the presence of opiates (heroin), cocaine, and cannabis (tetrahydrocannabinoids) metabolites. Urinalysis was performed by the staff nurses of the addiction unit, under direct observation to ensure authenticity.

Validity variables and procedure

Real-world clinical validation studies for substance abuse typologies should report the strength of an association between the conditions of a specific typology and the variables that are most useful to clinicians. In this case, to verify clinical validity, differences in internal, external, and predictive validity must be demonstrated. On the basis of their (internal) typological significance, i.e., variables that were included in the original structure of the alcoholism models,[4] patients were asked to provide information regarding the history of alcohol use. The clinical assessment also comprised constructs that were selected on the basis of external validity purposes, i.e., variables that were not included in the original structure of the typologies.[4] Thus, the psychometric protocol follows the rationale of the cognitive-behavioral model of substance abuse[24,27]: a) high-risk situations that enhance the likelihood of substance use were assessed with the Inventory of Drug-Taking Situations (IDTS)[28]; b) the beliefs that drinkers hold about alcohol effects, commonly referred

to as alcohol expectancies, were assessed with the Alcohol-Related Beliefs and Expectations Questionnaire (ABEQ)[29]; and c) alcohol cravings were assessed with the Penn Alcohol Craving Scale (PACS).[30]

For clinical outcome analysis, a single composite measure was calculated. For 6 months, the attendance of scheduled psychotherapeutic sessions (group and individual) and the drug consumption status (corroborated by urinalysis results) were recorded and used as objective indicators of treatment performance (predictive validity).[4] Urine samples were collected on a random basis from all participants. To be included in the treatment protocol, patients had to agree to abstain from "hard drugs" such as cocaine and heroin. "Soft drugs," such as cannabis, were tolerated. Data were generated during the course of the outpatient treatment program and were assessed at every unit contact by professional staff members.

Therefore, patients were characterized as having good outcomes at 6 months if they remained in treatment, attended therapeutic sessions on a regular basis, and revealed none or only one urine sample positive for heroin or cocaine. If patients dropped out before the end of month 6, attended therapeutic sessions sporadically, or had more than one positive urine sample, they were defined as having poor outcomes.

Subtyping procedures

The literature has introduced several classification schemes to discriminate the Cloninger et al. types in clinical terms.[22] Taking into consideration previous concordance rates and agreement analysis between the classification procedures, the von Knorring et al.[31] criteria were selected.[32]

Briefly, the clinical criteria and decision process for subtyping of the Cloninger typology were as follows: for type I, the presence of subjective drinking problems starting after age 25, first treatment contact after age 30, and few social complications (legal, work problems); for type II, subjective drinking problems starting before age 25, first treatment contact before age 30, and frequent social complications (legal, work problems). The decision procedure in the set was as follows: when the specified criteria for each subtype (I or II) were present, subjects received a positive score for each item endorsed (+1); when the specified criteria were not present, subjects received a negative score (-1). Afterwards, for patient allocation purposes, the algebraic sum of the items was calculated and quantitative scores were transformed into categorical data on the basis of higher total positive scores (or lower negative scores) in each subtype.

In their original study, Babor et al.[9] used a cluster analysis based on 17 characteristics representing four underlying domains: vulnerability factors, alcohol involvement, chronicity, and comorbid psychopathology. Since this procedure is time-consuming, especially in the clinical context, we chose to use a more economical and valid scheme.[13] The clinical criteria and decision process for subtyping were as follows: 1) standard drinks per drinking day; 2) relief drinking; 3) number of alcohol-related medical conditions; 4) negative physical consequences; and 5) social problems. To operationalize these variables, we used the quantity/frequency (QF) method, MAST, and a semi-structured clinical interview. Type B subjects were expected to score higher on each of the five dimensions. Sums were calculated for the five characteristics and dichotomized using median split: upper half, type B; lower half, type A.[13]

Ethical approval

All subjects included in the study provided informed consent and their participation was voluntary. The study was approved by the local Ethics Committee of the Faculty of Medicine, Universidade de Lisboa, Lisbon, Portugal.

Measures

Michigan Alcoholism Screening Test (MAST)

The MAST is one of the most widely used screening instruments for problem drinking.[25] This scale, composed of 25 weighted yes/no items, has been used mainly as an epidemiological tool. However, administration of the MAST also allows characterization of alcohol-related problems. This instrument has been validated in Portuguese alcohol dependents with good psychometric properties.[33]

Alcohol-Related Beliefs and Expectations Questionnaire (ABEQ)

The ABEQ is a 61-item self-administered instrument designed to evaluate beliefs and expectancies related to alcohol effect. It has demonstrated good reliability and validity in alcohol user populations.[29] The inventory showed good psychometric properties with high internal consistency (Cronbach's alpha = 0.984) and adequate stability over time (Spearman coefficient = 0.76). Factor analysis isolated six factors that explain 62.62% of the total variance: (F1) Factor 1, global positive effects and facilitation of social interactions; (F2) Factor 2, expectancies regarding activation and sexual pleasure effects; (F3) Factor 3, composed of items that translate expectancies regarding positive effects on activity and mood; (F4) Factor 4, dimension of the expectancy that alcohol might work as an escape from negative emotional states; (F5) Factor 5, translates expectancies of sexual disinhibition; and (F6) Factor 6, expresses expectancies on alcohol related to diminution of negative feelings about oneself and of evaluated anxiety. In our study, the ABEQ presented a Cronbach's alpha of 0.98.

Penn Alcohol Craving Scale (PACS)

The PACS is a brief self-administered instrument, with a multi-item, single-factor structure. This five-item scale has demonstrated good psychometric qualities regarding reliability (Cronbach's alpha = 0.92) and concurrent,

predictive, and discriminant validity.[30] This instrument has also been validated in Portuguese alcohol dependents with good psychometric properties.[34]

Inventory of Drug-Taking Situations (IDTS)

Based on Marlatt's eight-category system, the IDTS is a 50-item self-report questionnaire that provides a profile of the situations in which an individual has used a substance of abuse.[28] Eight categories of high-risk situations are considered, namely: unpleasant emotions (UE), physical discomfort (PD), pleasant emotions (PE), testing personal control (TC), urges and temptations to use (UT), conflict with others (CO), social pressure to use (SO), and pleasant times with others (PT). Second-order factors are defined by three global categories: 1) (N) negative situations (combining UE, PD, and CO); 2) (P) positive situations (combining PE and PT); and 3) (T) temptation situations (combining UT, SO, and TC).[35] In our study, the IDTS presented a Cronbach's alpha of 0.97.

Statistical analysis

The normal distribution of the variables was assessed using the Kolmogorov-Smirnov test. Chi-square (2- vs. -2) and Student's *t* tests were used to study the relation between baseline sociodemographic characteristics and clinical variables. The Mann-Whitney *U* test was used to assess group differences regarding the measurement of ''average medication dosage'', because this variable was not normally distributed. Pearson correlational analysis was used to measure the strength of a supposed linear association between the variables. To assess the internal consistency of the ABEQ and IDTS, Cronbach's alpha coefficients were computed. The ODP-AP were allocated into subgroups on the basis of each alcoholism typology procedure. For subgroup comparisons regarding sociodemographic, drinking, treatment, and cognitive-behavioral variables, chi-square (2- vs. -2) and Student's *t* tests were used. All variables were then reinvestigated with a general linear model (GLM), using total MAST score (and age) as covariates to control for the influence of the variable ''alcohol-related problems'' on the differences between the subgroups. The F test was used to interpret the overall significance of the model. Categorical outcomes were investigated with a chi-square analysis.

Data were analyzed in SPSS version 20.0. Statistical significance was defined as $p < 0.05$.

Results

No significant differences were observed regarding drinking, opiate treatment, and typology variables ($p > 0.05$). Gender comparisons showed that female patients were significantly ($F = 1.4/p < 0.01$) younger than male patients (mean $\pm$ SD = 33.4$\pm$5.7 vs. 42.9$\pm$5.7 years). Type B and type II patients presented a higher prevalence of unemployment when compared with type A and type I; however, only Babor typology was significant. As expected, patients classified as type B and type II reported significantly more alcohol-related problems (total MAST score), average number of drinks per week (QF), and earlier onset of alcohol abuse and dependence when compared with type A and type I patients. Lifetime history of major depression was reported by 7.9% of ODP-APs. No significant differences were observed between the subgroups ($p > 0.05$). Type B and type II patients presented a higher prevalence of family history of alcoholism (FHA) when compared with type A and type I patients; however, the difference was not statistically significant. Table 1 summarizes the sociodemographic and clinical differences between the subtypes.

Generally, type II and type B patients presented higher scores in all eight subscales and second-order global categories of the IDTS as compared with type I and type A patients. A closer examination showed that only the subscales UE, PD (only type I/II), TC (only in type I/II), UT, CO, N, and T exhibited statistically significant between-group differences. The GLM adjusted for the variables ''age'' and ''alcohol-related problem severity'' (MAST) showed that the differences between the subtypes remained significant. Results are summarized in Table 2.

When considering the ABEQ, patients classified as type II and type B presented significantly higher scores in the majority of ABEQ dimensions as compared with patients classified as type I and type A. Closer examination, after controlling for the effect of confounders (''age'' and ''alcohol-related problems''), showed that only the factors 1 (only type I/II), 2, 3, 6, and total score remained significant. Results are summarized in Table 3. Type II/B patients showed higher craving scores as measured by PACS when compared with type I/A patients, but the differences were not significant ($p > 0.05$).

Analysis of results over the 6-month period revealed that 24.5% of ODP-APs were dropouts, 81.6% attended therapeutic sessions on a regular basis, and 18.4% attended sporadically (dropouts not included). When considering the composite measure outcome, results indicated that patients enrolled in OMT classified as type II and type B drinkers presented significantly poorer outcomes than patients defined as type I and type A. Results are presented in Table 4.

Discussion

In general, ODP-APs classified as type II/B presented an early and much more severe drinking problem as compared with ODP-APs defined as type I/A. These differences clearly discriminate two distinct profiles of problem drinking in an opiate-addicted population. Although no single method or taxonomy for classification of specific subtypes of alcoholics has been universally accepted as definitive,[5-6] research identifies and generally accepts two basic phenotypes of alcohol-dependent drinkers[7]: a low-severity/vulnerability subgroup and a high-severity/vulnerability subgroup.[4] This classification somewhat resembles the alcoholism models proposed by Cloninger et al.[8] and Babor et al.,[9] in that low-severity/vulnerability patients are characterized by a later onset of problem drinking, less severe alcohol dependence and

Table 1 Sociodemographic and clinical variables by alcoholism subtype

	Cloninger			Babor		
	Type I (n=61; 67%)	Type II (n=30; 33%)	Statistics	Type A (n=52; 57%)	Type B (n=39; 43%)	Statistics
Sociodemographic variables						
Age	42.2 (6.4)	39.9 (6.6)	ns	42.7 (6.3)	39.7 (6.4)	ns
Education (years)	6.4 (2.4)	7.5 (3.3)	ns	6.7 (2.5)	6.9 (3.2)	ns
Gender (%)						
Male	83.0	87.5	ns	82.5	87.1	ns
Female	17.0	12.5		17.5	12.9	
Marital status (%)						
Single	70.2	50.0	ns	67.5	58.1	ns
Married/marital union	12.8	12.5		12.5	13.0	
Separated/divorced	17.0	37.5		20.0	29.0	
Professional status (%)						
Active workers	29.8	29.2	ns	35.0	22.6	$\chi^2 = 3.3$*†
Retired	21.3	4.2		25.0	3.2	
Unemployed	48.9	66.7		40.0	74.2*	
Drinking variables						
MAST total score	12.2 (7.3)	17.5 (8.2)	F = 0.2†	10.2 (5.9)	18.8 (7.6)	F = 0.4†
PACS	5.3 (2.1)	7.0 (3.2)	ns	4.9 (2.4)	5.8 (3.1)	ns
Age at onset (drinking)	14.1 (3.7)	13.4 (3.2)	ns	14.3 (5.9)	13.4 (3.0)	ns
Age at onset (abuse)	25.1 (5.8)	18.3 (1.7)	F = 10.4‡	25.2 (5.8)	19.9 (4.4)	F = 16.7‡
Age at onset (dependence)	32.8 (4.6)	24.3 (3.5)	F = 4.4‡	32.4 (6.6)	26.9 (4.5)	F = 1.6‡
QF	54.2 (46.8)	108.9 (78.9)	F = 0.9†	43.4 (41.5)	109.2 (68.7)	F = 6.6‡
FHA (%)	41.3	54.2	ns	35.9	58.1	ns
Opioid variables						
Methadone (%)	66.0	45.8	ns	62.5	54.8	ns
Average dosage (mg)	69.5 (26.5)	54.7 (24.9)	ns	62.1 (24.8)	72.5 (28.7)	ns
Buprenorphine (%)	34.0	54.2	ns	37.5	45.2	ns
Average dosage (mg)	7.5 (1.1)	6.6 (3.8)	ns	7.4 (1.2)	6.7 (3.7)	ns

Results expressed as mean (standard deviation), unless otherwise stated. Groups were compared using Student's *t* and chi-square (2- vs. -2) tests. The Mann-Whitney *U* test was used to assess group differences in average medication dosage.
FHA = family history of alcoholism; MAST = Michigan Alcoholism Screening Test; ns = not significant; PACS = Penn Alcohol Craving Scale; QF = quantity/frequency.
* p-value statistically significant (2 × 2 matrix); † $p < 0.05$; ‡ $p < 0.01$.

alcohol-related problems, less rapid disorder progression, and a better prognosis. Conversely, high-severity/vulnerability patients are characterized by an early onset of problem drinking, a history of psychopathology, higher levels of maladaptive personality traits, and severe alcohol dependence and alcohol-related problems.

The main aim of this study was to assess how key clinical and cognitive-behavioral constructs respond to these classifications of alcoholism. When considering the taxonomy of alcohol use triggers, our findings reveal that ODP-APs classified as type II/B reported a more severe alcohol intake profile than those classified as type I/A.

Table 2 High-risk situations (IDTS) by alcoholism subtype

	Cloninger			Babor		
	Type I (n=61; 67%)	Type II (n=30; 33%)	Statistics	Type A (n=52; 57%)	Type B (n=39; 43%)	Statistics
Unpleasant emotions	6.2 (6.3)	14.8 (7.5)	F = 0.08*	6.3 (6.7)	12.9 (7.6)	F = 0.4*
Physical discomfort	1.9 (2.5)	4.4 (4.5)	F = 7.9†	2.1 (2.7)	3.7 (4.2)	ns
Pleasant emotions	5.8 (4.4)	6.5 (3.9)	ns	5.3 (4.4)	6.8 (4.0)	ns
Testing personal control	2.0 (2.7)	4.1 (4.4)	F = 4.9†	2.1 (2.9)	3.5 (4.0)	ns
Urges and temptations to use	2.2 (2.7)	4.5 (4.3)	F = 6.4†	1.6 (2.2)	4.8 (4.0)	F = 7.7†
Conflict with others	3.7 (4.7)	14.1 (8.1)	F = 6.1†	2.8 (4.3)	12.9 (8.0)	F = 6.9†
Social pressure to use	2.7 (3.4)	4.6 (5.4)	ns	2.6 (3.4)	4.4 (5.3)	ns
Pleasant times with others	3.4 (3.8)	5.9 (5.2)	ns	3.3 (3.7)	5.5 (5.0)	ns
Negative situations	11.9 (11.5)	33.4 (18.8)	F = 1.8*	11.3 (12.3)	29.6 (18.2)	F = 1.1*
Positive situations	9.2 (7.3)	12.4 (8.5)	ns	8.6 (6.9)	12.4 (8.4)	ns
Temptation situations	6.9 (7.5)	13.3 (13.1)	F = 11.7†	6.3 (7.5)	12.7 (12.2)	F = 14.3†

Results expressed as mean (standard deviation). Groups were compared with a linear regression model adjusted for age and problem drinking severity (Michigan Alcoholism Screening Test).
IDTS = Inventory of Drug-Taking Situations; ns = not significant.
* $p < 0.01$; † $p < 0.05$.

Table 3 Alcohol-related expectations (ABEQ) by alcoholism subtype

	Cloninger			Babor		
	Type I (n=61; 67%)	Type II (n=30; 33%)	Statistics	Type A (n=52; 57%)	Type B (n=39; 43%)	Statistics
F1	51.9 (21.1)	76.6 (27.2)	F = 0.2*	53.4 (25.3)	69.5 (24.8)	ns
F2	20.4 (8.2)	26.4 (13.7)	F = 1.2*	19.8 (8.4)	25.8 (12.5)	F = 1.7*
F3	27.5 (11.6)	43.3 (17.9)	F = 1.8†	28.1 (12.4)	39.0 (17.9)	F = 1.1*
F4	26.8 (22.3)	32.2 (11.4)	ns	21.5 (10.2)	37.8 (23.4)	ns
F5	6.5 (3.3)	8.3 (3.8)	ns	6.3 (3.1)	8.0 (3.8)	ns
F6	22.5 (21.8)	28.4 (10.3)	F = 1.2*	18.8 (8.4)	31.6 (24.3)	F = 1.4*
T	122.9 (47.3)	173.0 (61.9)	F = 0.0†	119.2 (51.3)	166.9 (55.1)	F = 0.0†

Results expressed as mean (standard deviation). Groups were compared with a linear regression model adjusted for age and problem drinking severity (MAST).
ABEQ = Alcohol-Related Beliefs and Expectations Questionnaire; F1 = factor 1: global positive effects and facilitation of social interactions; F2 = factor 2: expectancies regarding activation and sexual pleasure effects; F3 = factor 3: positive effects on activity and mood; F4 = factor 4: escape from negative emotional states; F5 = factor 5: sexual disinhibition; F6 = factor 6: diminution of negative feelings about oneself and of evaluated anxiety; T = total score.
* $p < 0.05$; † $p < 0.01$.

Qualitatively, ODP-APs classified as type II and type B were significantly more likely to use and abuse alcohol in negative and temptation situations than those classified as type I/A. Indeed, comprehensive evaluations of relapse situations have demonstrated that negative situation triggers play a critical role in alcohol consumption (re)engagement.[24,36] The results of the present study are consistent with previous investigations that found high IDTS negative profile scores in severely alcohol-dependent patients,[28,35] suggesting that type II/B are particularly much more vulnerable to triggers such as intrapsychic unpleasant emotions or interpersonal conflictuality. In fact, the greater the level of alcohol dependence, the lower the confidence to resist the urge to drink heavily in high-risk situations, especially in situations involving unpleasant emotions and conflict with others.[37] A previous study by Waldrop et al.[38] reported results somewhat consistent with our findings. The authors compared high-risk triggers and situations among subjects with alcohol dependence or cocaine dependence, with or without posttraumatic stress disorder (PTSD), and found that subjects with PTSD+ reported significantly greater substance use in negative situation triggers than PTSD– subjects. The findings were discussed in light of the self-medication theory.[39] This assumption that enhances the negative reward properties of alcohol could be reasonably adjusted to our results, as type II/B patients are normally characterized by frequent psychiatric comorbidity.[4] The ABEQ also discriminates individuals with a different subtype of problem drinking. Expectancies usually result from the drinker's previous direct and indirect learning experiences with alcohol, and are presumed to play a central role in the decision to drink.[40] For instance, drinkers may be more susceptible to use alcohol if they hold the belief that alcohol is an efficient way to deal with negative emotions and facilitate a more affirmative social behavior. The results of this study indicate that ODP-APs classified as type II/B endorse generally higher levels of positive alcohol-related expectancies than type I/A subjects. This result supports the hypothesis that individuals who drink more and present a severe drinking problem have significantly more positive expectancies about the effects of alcohol.[40-42] Nevertheless, it is important to question why type II/B patients, who are acknowledged to exhibit more alcohol-related consequences, reported higher levels of positive expectancies related to the effect of alcohol when they face higher levels of its negative effects. It seems that the behavioral and social consequences of alcohol abuse did not influence alcohol-related cognitions as

Table 4 Outcome differences by alcoholism subtype (%)

	Cloninger			Babor		
	Type I (n=61; 67%)	Type II (n=30; 33%)	Statistics	Type A (n=52; 57%)	Type B (n=39; 43%)	Statistics
Dropouts	17.6	26.7	ns	14.8	27.3	ns
RAPS	85.3	66.7	ns	96.3	59.1	$\chi^2 = 10.3$*
Urinalysis						
Heroin	17.1	5.9	ns	5.7	26.1	ns
Cocaine	14.6	5.9	ns	17.1	4.3	ns
Cannabis	48.8	47.1	ns	45.7	52.2	ns
Composite measure						
Good outcome	76.6	12.5	$\chi^2 = 14.4$†	77.5	25.8	$\chi^2 = 11.1$†
Poor outcome	23.4	87.5		22.5	74.2	

Groups were compared using the chi-square test.
RAPS = regular attendance of scheduled psychotherapeutic sessions (group and individual).
* $p < 0.05$; † $p < 0.01$.

much. The self-medication hypothesis might be used to attempt to explain this inconsistency, given that patients who experience more psychological distress, such as type II/B drinkers, may derive more reward properties from alcohol – the ability of alcohol to play down negative feelings and symptoms. An alternative explanation implicates a particular cluster of personality traits that generally characterize these patients, particularly type II patients: high novelty seeking, low harm avoidance, and cyclothymic affective temperament.[2] These traits reflecting impulsivity and disinhibition make these patients more vulnerable to pharmacological benefits from alcohol.

Although studies have shown that alcohol craving might be related to alcoholism subtype,[2,7,34] this hypothesis was not confirmed in our study. This fact might be explained by several factors, such as the heterogeneity of the sample and the timing of craving assessment. In the clinical context, craving seems to be related to active drinking and complete abstinence. Hence, it is to be expected that cravings could be different if patients were assessed directly at admission for treatment or after weeks of treatment. Furthermore, the consumption of other substances rather than alcohol as well as the pharmacological treatment may have affected patterns of craving in our sample.

OMT with methadone or buprenorphine is a widely used form of substitute therapy, with effective results in heroin dependence trials.[43] It keeps patients in treatment and decreases heroin use and related crime and health problems.[44] However, heroin users often drink alcohol excessively.[3,23] Studies demonstrate that alcohol dependence can worsen the outcome of OMT and appears to be associated with more illicit drug use and higher rates of dropout and mortality.[45] Furthermore, it has been shown that methadone-using patients who drink excessively are at a significantly greater risk of developing cirrhosis, esophageal varices, other medical complications, and death.[46] Therefore, drug addiction units should have a clear policy regarding alcohol problems and provide appropriate combined pharmacological and psychosocial treatment.

In a previous study conducted at our addiction unit, 58.2% of heroin-dependent patients reported intake of alcohol in the past 6 months and 57.5% in the previous month. Alcohol use was associated with cannabis use and younger age.[47] In some cases, OMT might reduce alcohol use by offering a means of neurobiological and social stabilization. Nevertheless, despite the beneficial effects of OMT, it has been suggested that methadone treatment may lead to an increase in alcohol use and dependence.[46] For instance, patients may replace heroin with an increase of drinking. Some reports described the practice of "boosting", i.e., combining the use of alcohol and methadone to obtain a qualitatively different euphoria experience that could not be obtained from either drug alone.[3] Therefore, ODP-APs may need higher methadone and buprenorphine doses in order to balance polydrug use. In light of these considerations, it would be reasonable to expect that ODP-APs classified as type II and type B would receive higher doses of methadone and buprenorphine than ODP-APs classified as type I and type A. However, this hypothesis was not confirmed in our study. Although type II/B patients reported signi ficantly more alcohol consumption per week and alcohol-related problems than type I/A patients, doses of methadone and buprenorphine were not different between the subgroups. When considering the OMT protocol, our longitudinal analysis over a 6-month period showed a better treatment response rate in type I/A than in type II/B patients. This finding is in accordance with several previous studies in alcohol-dependent populations, confirming that type I/A patients tend to present a better prognosis in clinical settings than type II/B patients.[10,11] We know that treating OMT patients with a combined heroin and alcohol problem is more challenging than working with clients with no polydrug use, especially if these patients present higher rates of premorbid risk factors, more severe drug problems, and psychiatric comorbidity. According to our findings, we can speculate that ODP-APs classified as type II and type B are more predisposed to noncompliance with program rules due to the unstable personality traits that commonly characterize this phenotype. Beside alcohol and typology related-factors, other features can be considered in examining clinical progress during OMT. For instance, a study in a sample of methadone patients entering six methadone treatment programs concluded that greater satisfaction with treatment at 3 months was a significant predictor of retention at 12 months, whereas greater severity of legal problems was associated with shorter retention.[48]

The results reported herein should be considered in light of certain limitations. First, comparisons across studies should be done cautiously, as diverse study methods have been used to assess alcohol use disorders. Second, other psychological dimensions, e.g., motivation to change, could account for the differences in cognitive-behavioral profiles observed.[49] Studies have argued that readiness to change accounts for the differentiation of IDTS drinking profiles.[28,35] In addition, although our sample did not show evidence of major psychopathological disorders (e.g., bipolar disorder, schizophrenia), comparisons with respect to dimensional psychopathologic symptoms were not addressed. These distress symptoms (often related to a drug-use lifestyle) were likely to influence cognitive-behavioral features. Third, although drug use was screened by urinalysis, alcohol use was only assessed by patients' self-reports. Fourth, despite results that corroborate the predictive value of the binary alcoholism typologies evaluated, our decision regarding patient treatment progress considers a combined measure of outcome (urinalysis results and unit attendance), which may invite criticism. For instance, some patients who dropped out of opiate treatment might have become drug-free. Finally, despite the relatively small sample size of the study, which may have led to insufficient power and type 2 error, we attempted to assess a polydrug population that was homogenized by several clinical restrictions. To the best of our knowledge, this is the first report that takes into account the alcoholism typology paradigm in such a

common and serious mental health setting as lifetime multiple substance dependence. In sum, this study supports the Cloninger and Babor models of alcoholism in an opiate-dependent population. These two subtypes differ on a variety of drinking variables, cognitive-behavioral constructs, and treatment outcomes. We expect that this study will motivate investigators to continue to evaluate the clinical utility of substance abuse typologies to provide clinical decision-makers with an empirical level of confidence.

Disclosure

The authors report no conflicts of interest.

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