NETER ALCOHOLIC TYPOLOGY (NAT)a

J. M. NEVES CARDOSO*, ANTONIO BARBOSA, FATIMA ISMAIL and SAMUEL POMBO*

Alcoholism Unit Staff, Núcleo de Estudos e Tratamento do Etilo-Risco (NETER), Department of Psychiatry, Santa Maria’s General Hospital, Lisbon, Portugal

(Abstract — Aims: To establish an alcohol-dependent drinker’s clinical typology, based on patients attending the Alcoholism Unit of Santa Maria’s General Hospital in Lisbon, Portugal. Methods: A multivariate statistical analysis was used to extract the typology solution. Results: We obtained five factors: Anxiopathic, typifies anxious functioning; Heredopathic, congregates familiar and genetic influences on alcoholism; Thimopathic, typified by affective symptomatology; Sociopathic, characterized by disruptive behaviours under alcohol influence; and Addictopathic, isolates younger individuals who consume alcohol and other types of psychoactive substances. Conclusions: There are increasingly alcoholic polymorphic subtypes derived from the interactive complexity between genetic/family and psychosocial factors.

INTRODUCTION

In order to clarify the natural history of alcoholism (Vaillant, 1983), several categories of alcoholics have been proposed, typifying empirically the complexity and heterogeneity of alcoholic behaviours. In 1960, Jellinek became a pioneer when first developed a modern scientific approach of the problem, systematizing five alcoholic types, from which Type 3 (Gamma) and Type 4 (Delta) are pointed out in clinical terms.

Based on this approach other typologies emerged from alcoholology literature, namely those by Cloninger et al. (1981), Schuckit (1985) and Babor et al. (1992), who presented a two-type solution typology. In 1981, Cloninger suggested the dichotomy Type 1 versus Type 2. The first one (milieu-limited) is characterized by a gradual development and an onset after 20 years of age. The second one (male-limited) distinguishes an early onset of alcohol consumption with swift development for dependence, and is associated with marked impulsivity features. Schuckit (1985) preconized the notion of primary alcoholism (70% of the cases, early onset, male predominance, strong hereditary penetrance) and secondary alcoholism (later onset, subjacent psychopathology). Babor et al. (1992) proposed the distinction between alcoholism Type A, with late onset of alcohol-related problems and better prognosis, and Type B, categorizing an alcoholism with early onset, marked by childhood risk factors, family history of alcoholism, high level of dependence, and psychopathological comorbidity.

Hauser and Rybakowski (1997) based on K-means cluster analysis delineated three subtypes of alcoholic males: Type 1 characterized by late onset of alcohol dependence, low prevalence of family history of alcoholism, and mild severity of the pathology course; the Type 2 characterized by early onset of alcohol dependence, high prevalence of parental alcoholism, antisocial personality, and severe alcohol-related problems; and finally Type 3 characterized by early onset of alcohol dependence, family history of psychiatric diseases, severe alcohol-related problems, and high prevalence of psychiatric disturbances and somatic diseases.

Lesch et al. (1988), Zucker (1987), and recently Windle and Scheit (2004) introduced a four-type solution of alcoholism. Lesch et al. (1988) distinguished four evolutionary types depending on the family history of alcoholism, previous personal psychopathology, and neurobiological substratum. Thus, Type I evidences the appearance of early withdrawal symptoms, craving, which can be associated with an endorphinical vulnerability. The Type II shows suicidal intentions, anxiety, and premorbid conflicts, with changes in what concerns the serotoninergic system. Type III typifies an aggressive and impulsive behaviour with the existence of psychiatric comorbidity. In this type a chronobiological change can be previewed. Type IV shows premorbid organic cerebral lesions associated with a deterioration of individual’s psychic, organic, and social sphere. Lesch’s typology has also been related to secondary depression in weaned alcoholics (Kiefer et al., 1999), homocysteine levels (Bleich et al., 2004), and potential anticraving pharmacotherapies (Chick et al., 2000; Lesch et al., 2001). Zucker’s (1987) alcoholic subtypes varied along the dimensions of comorbid antisocial personality, negative affect, age of onset and alcohol severity. Windle and Scheit (2004) replicated the cluster analytical procedure used by Babor et al. (1992) to identify his typology (Type A/Type B), with a larger and more heterogeneous alcoholic sample. The new analytical findings indicated four alcoholic subtypes: Mild course—later alcohol onset; fewer years of drinking; lower levels of alcohol consumption; withdrawal symptoms; fewest childhood conduct problems; lowest family history for alcoholism. Polydrug—highest levels of polydrug use, symptoms of major depression, generalized anxiety, and psychopathy. Chronic/ASP—high levels of alcohol consumption and adult antisocial behaviour.

In Portugal, Cardoso et al. (1997) studied an alcoholic outpatient population, concluding that a preliminary factorial structure is constituted by five conditions: Etopathic—associated with massive alcohol consumption, difficulty to anticipate positive aspects (fatalism), and corresponding...
nowadays to an older age group. Alexopathic—outlines an alexithimic profile showing indicators of less time of abstinence in the last 3 months, having introspective features and personal and family antecedents of depression. Thympathic—reveals a psychopathological profile of anxiety and depression. Sociopathic—typifies a profile with a high level of dependence and deep social repercussion of alcoholic consumption. Heredopathic—personifies a pattern of early onset of alcohol consumption, father alcoholism background, verbal aggressiveness, and suicidal tendencies during alcohol consumption.

Alcohol dependence phenotype has also been aetiologically preconized as genetically heterogeneous. Miyasaka et al. (2004) found that alcoholic patients with antisocial personality disorder and with first-degree positive family history of alcoholism were significantly associated with a higher frequency of the –81G allele. Considering alcoholism typifying, Mottagui-Tabar et al. (2005) supported that the association for the –602 marker allele frequency of Neuropeptide Y polymorphism was strengthened when only Cloninger’s Type 1 alcoholic subjects were included.

Clinical and psychological characterization of alcoholic subtypes should be addressed to provide a more accurate research tool for pharmacologically and/or psychologically tailored treatments. Pettinati et al. (2000) and Dundon et al. (2004) found in more favourable treatment outcomes Babor’s Type A alcohols when treated with sertraline (serotonergic pharmacotherapy). Kiefer et al. (2005) also found that acamprosate and naltrexone are effective in different subgroups. Comparing the course of abstinence rates, acamprosate was mainly efficacious in patients with low baseline somatic distress, whereas naltrexone was effective especially in patients with high baseline depression. Baseline craving showed no predictive value. Pharmacological treatment was efficacious in Type 2 alcohols according to Cloninger: Applying Lesch’s typological differentiation, acamprosate was shown to be mainly effective in Type I, whereas naltrexone revealed best treatment effects in Types III and IV.

The aim of this study was to establish a clinical typology of alcohol dependents, based on outpatients integrated in the alcoholism unit of Santa Maria’s General Hospital in Lisbon, Portugal.

METHODS

Procedure
A sample of 188 alcohol-dependent patients according to DSM-IV-TR criteria of the American Psychiatric Association (2000), identified also with MAST (>5), was submitted to an outpatient therapeutical programme conducted by a multidisciplinary team comprising psychiatrists, psychologists, social workers, nurses, and an internal doctor. The therapeutical programme included screening, clinical semi-structured history, motivation evaluation, psychological evaluation, ambulatory detoxification, individual psychotherapy, and weekly cognitive behaviour treatment.

Exclusion criteria are as follows: presence of illicit drugs dependence history, present serious physical disease, severe psychiatric disorder (schizophrenia and other psychotic disorders, dementia, delirium), state of alcoholic intoxication (or other toxic substance), memory disorders, and marked cognitive deficit (assessed by MMSE) which does not enable the necessary filling in of some self-evaluation instruments.

Measures
Michigan Alcoholism Screening Test (MAST). MAST is one of the most widely used screening instruments for the assessment of alcohol-related problems. It was developed by Selzer (1971) and validated to the Portuguese population by Serra et al. (1979). This scale has been used as an epidemiological tool in prevalence surveys of general populations. It is composed by 25 weighted yes/no items concerning drinking habits, alcohol dependence symptoms, and drinking-related problems.

Mini-Mental State Examination (MMSE). Developed by Folstein et al. (1975), it is the most widely used screening test of cognition in adults. The test attempts to quantify the patients’ capabilities in five fields: orientation, registration, attention and calculation, recall, and language. The test is divided into two sections, the first of which requires vocal responses and covers orientation, memory, and attention. The second part tests ability to name, follow verbal and written commands, write a sentence spontaneously, and copy a complex polygon.

Toronto Alexithymic Scale—20 items (TAS-20). The 20-item Toronto Alexithymia Scale was developed by Bagby et al. (1994) and adapted to the Portuguese population by Praceres et al. (2000). It has good psychometric qualities.

Hospital Anxiety and Depression Scale (HADS). It resulted from the General Health Questionnaire revision and was drawn up to overcome the somatic effects of comorbidity, according to which symptoms of somatic domain are a concomitant expression of physical and psychiatric disease, selecting exclusively psychological symptoms (Zigmond and Snaith, 1983).

Eysenck Personality Inventory (EPI). Personality test designed around a theory of personality developed by Eysenck and Eysenck (1964). Measures two pervasive, independent dimensions of personality: Extraversion–Introversion and Neuroticism–Stability. This scale was validated to the Portuguese population by Serra et al. (1980).

Severity Alcohol Dependence Questionnaire (SADQ). Designed by Stockwell et al. (1983) it is a self-administered questionnaire with 20 items, which was developed to measure alcohol dependence severity level. This scale is divided into five thematic sections of excessive alcohol consumption namely physical withdrawal symptoms, psychological withdrawal symptoms, craving, alcohol consumption, and relief withdrawal symptoms after abstinence period.

Symptom Check List (SCL-90-R). It was drawn and revised by Derogatis (1977). This 90-item inventory evaluates psychopathological symptoms in terms of nine symptomatology dimensions and three global indexes. These are summary evaluations of emotional disorders.

Social Dysfunction and Aggression Scale (SDAS). The SDAS was developed by Wistedt et al. in 1990 and it aims to evaluate individual cognition and aggressive behaviour. It comprises 11 items: two items measure inward-directed...
aggression and 9 items measure outward-directed aggression. In order to clarify the relation between aggressivity and alcohol consumption, the scale was applied twice: first, in abstinence (dry phase) and second, in alcohol consumption phase (wet phase).

*Yale–Brown Obsessive Compulsive Scale*—*heavy drinkers (Y–BOCS-hd)*. Based on similarities such as urges and desires to drink heavily and obsessive–compulsive disorders (OCD), Modell et al. (1992) developed the *Y–BOCS-hd*: a modified version of YBOCS that quantifies obsessive and compulsive qualities of heavy drinking. The tool is composed of a total scale and two subscales (obsessive and compulsive), including five items each.

*Marc Schuckit Standardized history for alcoholic patients.* (Adapted and translated into Portuguese by Cardoso et al. (1997)). This history describes standard alcohol consumption, abstinence periods, attitudes, and behaviours in the family, social and professional consequences of the abusive alcohol consumption, as well as personal and family background.

**Data analysis**

The Statistical Package for Social Sciences (SPSS-Version 10.0) was used to perform the statistical analysis of data. Considering the data normal distribution (test Kolmogorov–Smirnov) the factorial analysis multivariate method was applied, followed by varimax orthogonal rotation. A 95% confidence interval (CI) was adopted.

**RESULTS**

**Socio-demographic characteristics**

The sample comprised 188 alcohol dependents: 158 males (84%) and 30 females (16%). Age varied between 21 and 68 years, with a mean value of 42.2 years (SD = 9.95). The sample majority was Caucasian (94.7%), and low social class (20.4%) or middle-low class (39.1%). Regarding civil status 54.2% were married, 27.7% were single, and the others were separated (18.1%). Concerning education 75.6% had attended or completed basic school studies, while the others had concluded high school (12.9%) or had an academic degree (11.5%). Regarding professional activity 51% were non-qualified workers, 31.5% had a qualified professional activity, and the rest were business owners (10%) or had some activity linked with their degree (7.5%). Table 1 presents the socio-demographic characteristics.

**CLINICAL CHARACTERISTICS OF ALCOHOLIC POPULATION**

**Alcohol consumption characteristics**

Concerning clinical characterization of alcohol consumption, data shows that the average age of onset of drinking alcohol was 17.75 years (SD = 9.95). Out of the subjects 53.3% had family history of alcoholism, having nowadays daily consumption of 128.1 g of alcohol, while 64.5% presented a moderate level of alcohol dependence, and the others evidenced a high level of dependence (35.5%). The evaluation of aggressivity and social dysfunction revealed higher levels when under alcohol effect (‘in alcohol consumption phase’ = 13.52) rather than in periods of continued abstinence (‘in abstinence phase’ = 6.75). Obsessive and compulsive behaviours towards alcohol consumption presented an average score of 21.01. Table 2 presents the alcohol consumption characteristics.

Concerning the social evaluation of the sample, 24.1% showed a background of behaviour problems during childhood and adolescence; 41.6% registered problems related to their jobs, 29.3% presented legal problems, and 23.9% of the sample had already consumed other type of drug rather than alcohol. Table 3 shows the social characteristics of the sample.

The evaluation and quantification of psychopathological features showed the following average results: anxiety, 8.72; depression, 6.64; neuroticism, 14.48; alexithymia, 59.72; and the general symptomatology index, 1.19. Table 4

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**Table 1. Sample socio-demographic characterization**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N = 188</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years)</td>
<td>42.2 (SD = 9.95)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male (%)</td>
<td>84</td>
</tr>
<tr>
<td>Female (%)</td>
<td>16</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>Caucasian (%)</td>
<td>94.7</td>
</tr>
<tr>
<td>Black (%)</td>
<td>5.3</td>
</tr>
<tr>
<td>Civil Status</td>
<td></td>
</tr>
<tr>
<td>Single (%)</td>
<td>27.7</td>
</tr>
<tr>
<td>Married (%)</td>
<td>54.3</td>
</tr>
<tr>
<td>Separated</td>
<td>18.1</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
</tr>
<tr>
<td>Academic degree (%)</td>
<td>11.5</td>
</tr>
<tr>
<td>High school (%)</td>
<td>12.9</td>
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<tr>
<td>Basic education (%)</td>
<td>30.4</td>
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<tr>
<td>Uncomplete basic education (%)</td>
<td>45.2</td>
</tr>
<tr>
<td>Social Class</td>
<td></td>
</tr>
<tr>
<td>I (High) (%)</td>
<td>1.5</td>
</tr>
<tr>
<td>II (Medium–high) (%)</td>
<td>9.4</td>
</tr>
<tr>
<td>III (Medium) (%)</td>
<td>29.4</td>
</tr>
<tr>
<td>IV (Medium–low) (%)</td>
<td>40.1</td>
</tr>
<tr>
<td>V (Low) (%)</td>
<td>19.3</td>
</tr>
<tr>
<td>Profession</td>
<td></td>
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<tr>
<td>Graduated (%)</td>
<td>7.5</td>
</tr>
<tr>
<td>Business owner (%)</td>
<td>10</td>
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<tr>
<td>Qualified worker (%)</td>
<td>31.5</td>
</tr>
<tr>
<td>Non-qualified worker (%)</td>
<td>51</td>
</tr>
</tbody>
</table>

**Table 2. Characteristics of alcohol consumption**

<table>
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<tr>
<th>Characteristics</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years of onset of alcohol consumption</td>
<td>17.75 (SD = 7.41)</td>
</tr>
<tr>
<td>Daily average of alcohol consumption (g)</td>
<td>128.1 (SD = 81.4)</td>
</tr>
<tr>
<td>Family history of alcoholism (HF+) (%)</td>
<td>53.3</td>
</tr>
<tr>
<td>Level of alcoholic dependence (SADQ)</td>
<td></td>
</tr>
<tr>
<td>Mild (%)</td>
<td>64.5</td>
</tr>
<tr>
<td>High (%)</td>
<td>35.5</td>
</tr>
<tr>
<td>Obsessive and compulsive behaviours towards alcohol consumption (Y-BOCS-hd)</td>
<td>21.01 (SD = 9.29)</td>
</tr>
<tr>
<td>Aggressivity and Social Dysfunction (ASDS)</td>
<td></td>
</tr>
<tr>
<td>In alcohol consumption phase</td>
<td>6.75 (SD = 7.51)</td>
</tr>
<tr>
<td>In abstinence phase</td>
<td>13.52 (SD = 10.65)</td>
</tr>
</tbody>
</table>
Factor 1: Anxiopathic—this factor explains 27.7% of the total variance. It typifies neurotic functioning marked by anxiety (HADS, 0.78); emotional instability (Neuroticism, 0.77); aggressive behaviour during withdrawal from alcohol (SDAS, 0.66); psychopathological dimensional symptomatology (IGS, 0.85); and obsessions and compulsions related to alcohol consumption (Y-BOCS-hd, 0.51).

Factor 2: Heredopathic—this factor is responsible for 13.9% of total variance, with high indicators of alcoholism family history (HF+, 0.80); alcohol dependence (SADQ, 0.62); and low social class (Graffar, –0.72).

Factor 3: Thymopathic—this factor is responsible for 11.7% of total variance, expressing a change in what concerns affection regulation. This characterizes an alexithymic (TAS-20, 0.81); and depressive (HADS, 0.75) profile, revealing previous demotion and/or dismissal from job due to alcohol consumption (employment problems, 0.65).

Factor 4: Sociopathic—this factor explains 8.9% of total variation, and typifies the early contact with alcohol (age of onset alcohol consumption, –0.59); aggressive behaviour when consuming alcohol (SDAS, 0.70); and previous legal problems such as ‘drunk driving’ or ‘having been arrested due to public intoxication’ (legal problems, 0.74).

Factor 5: Adictopathic—this factor is responsible for 6.8% of total variance, and isolates the younger individuals (age, –0.65) consuming other types of psychoactive substances (other drugs consumption, 0.81) and with a disruptive behaviour in childhood and/or adolescence (behaviour problems, 0.62).

DISCUSSION

Typologies of alcohol addiction varied during studies from a two-type solution (Cloninger et al., 1981; Schuckit, 1985; Babor et al., 1992) to a four-type solution (Zucker, 1987; Lesch et al., 1988; Windle and Scheidt, 2004). Despite other authors supporting a two-subtype solution for alcoholism (Cloninger et al., 1981; Schuckit, 1985; Babor et al., 1992), we didn’t corroborate this alcoholic typological system. As referred by Windle and Scheidt (2004), we believe that a four- or our five-subtype resolution, rather than two, suggest a more useful multidimensional classificatory approach for the heterogeneity of alcoholic behaviours (use, abuse, and dependence), providing a helpful guiding research for optimized treatment matching strategies.

Like in our preliminary alcoholic typology (Cardoso et al., 1997), we extracted a five-subtype solution based on a factorial analysis with varimax rotation that explains 69.1% of the total variance.

The first subtype (Anxiopathic) is a group whose alcoholic behaviours were modelled by anxious personality traits, providing a variation in the alcohol consumption pattern, behaviour, and emotionality. Withdrawal from alcohol can lead to aggressive behaviour, sometimes in the relation to directed alcohol-seeking behaviour and, in other times, in relation to extreme anxiety. The involvement of the gamma aminobutyric acid-A (GABA-A) receptor subunit in regulation of anxiety played by genetic variability in components of anxiety-modulating pathways is a risk contribution to the pharmacodynamic actions of alcohol in the CNS (Edenberg et al., 2004).

Several studies have showed a positive relationship between the obsessive–compulsive component of alcohol craving, neuroticism, and anxiety dimension (Mathew et al., 1979; Heinz et al., 2003; Breese et al., 2005). We can find an equivalent subtype, to some extent: Gamma type of Jellinek (1960), cumulatively increasing type of Zucker (1987),
Cloninger (1981) Type 1, Lesch’s et al. (1988) Type II, and Babor’s et al. (1992) Type A.

The Heredopathic factor (Factor 2) congregates one-subtype solution derived from family influences, in the unconditionally permissive alcohol societies, facilitating high substance dependence, mainly in the social classes with a low education and economic level (Crum et al., 1993; Oers et al., 1999). Recent genetic studies report that 50-60% of the risk for alcoholism is genetically determined (Heath et al., 1997; Prescott and kendler, 1999), and that individuals with a family history of alcoholism (FH+) are more likely to suffer from severe dependence of alcohol (Dawson et al., 1992; Shuckit, 1994). Morzorati et al. (2002) provided additional support for the premise that individuals with a family history of alcoholism may develop a tolerance to alcohol, which means they need to drink more in order to feel the same effects.

The Thymopathic profile corresponds to a group with socially stable life and coexist with a mild psychopathology, except in affective life. Alcohol consumption is used as a form of self-treatment for the negative affects (Khantzian, 1985). The relation between alcohol addiction and depression is very complex and intricate especially because alcohol dependence pathoplasticity can mimic depression syndrome. Schuckit’s (1985) studies show that 80% of alcohol-dependent patients complain about depressive symptoms, and one third or more meet the criteria for major depressive disorder. Recently Wang et al. (2004) found that the muscarinic acetylcholine receptor M2 gene (CHRM2) was strongly associated with both alcoholism and depression. Haviland et al. (1991) has been supporting the relationship between depressive dimension and alexithymia component in alcohol dependence. They concluded in recently sober alcoholics that the alexithymic cognitive dimension associated with an inability to identify feelings and to distinguish them from bodily sensations is related to depressive symptoms. Social consequences of alcoholism are extensive, causing many work problems such as absenteeism, reduced productivity, alcohol-related accidents in workplace, reduced work performance, unemployment, and loss of working time. Pary et al. (1988) reported more work problems in a population of depressed alcoholics. This third subtype is consistent, to some extent, with Lesch et al. (1988) Type III and negative affect subtype proposed by Zucker (1987) and Windle and Scheidt (2004).

The Sociopathic subtype (Factor 4) determines a group with the longest number of years of drinking, showing the coexistence of antisocial personality problems such as impulsivity, aggressive tendencies, and legal problems. This subtype is corroborated by the occurrence of one of the most prevalent comorbid conditions among alcoholics: the antisocial behaviour (Lewis et al., 1991; Hesselbrock and Hesselbrock, 1994; Virkkunen et al., 1994). In this case aggressive behaviour in alcoholic outpatients can be precipitated by alcohol intoxication. Regularly this ‘sociopathic’ conduct refers to externalizing behaviour problems such as participation in delinquency, adult criminality, aggressive acts, and other illegal activities. Considering the age of first contact with alcohol beverages, McGue et al. (2001) found that early age of first drink was associated not only with alcohol dependence, but also to a wide range of disinhibitory behaviour indicators. This alcoholic subtype is congruent with some of the characteristics of Jellinek’s (1960) gamma type, Cloninger’s (1981) Type 2, Zucker’s (1987) antisocial, Babor’s (1992) Type B, Lesch et al.’s (1988) Type III, Hauser and Rybakowski’s (1997) Type 2, and with chronic/antisocial personality of Windle and Scheidt (2004).

The Adictopathic (Factor 5) is a polydrug alcoholic subtype that reflects a hybrid group not devoted to a particular psychoactive substance. According to Staines et al. (2001) the lifetime diagnosis of joint alcohol and drug dependence and/or abuse is 64%. In fact, getting drunk was often linked with experiments with other drugs mainly in younger populations (Kaufman, 1982). Martin et al. (1996) reported that the most common alcohol/drug combinations were alcohol with cocaine (60%), alcohol with marijuana (51%), and alcohol with sedatives (31%). Regarding the relationship between alcoholics who abuse other substances and treatment outcomes, Tsuang et al. (1994) determined among primary alcoholic men in a 3 month follow-up study that those who had a history of stimulant or opiate use were more likely to have a drug use relapse. This alcoholic polydrug life-style (drug networks, drug dealing, sex trading, promiscuity, and other behavioural problems) may involve the patients in health risks associated with sexually transmitted diseases (STD) and human immunodeficiency virus (HIV) infections (Windle and Scheidt, 2004). There is a common factor with polydrug type of Windle and Scheit (2004).

CONCLUSION

There are increasingly alcoholic polymorphic subtypes derived from the interactive complexity between genetic/family and psychosocial factors of the societies in evolution. In order to study the replicability and stability of our NETER alcoholic typology (NAT), we extracted a five-subtype solution (anxiopathic, heredopathic, thymopathic, sociopathic, and adictopathic) based on clinical and psychological characteristics of a sample of individuals diagnosed with alcohol dependence, according to DSM-IV-TR, who sought treatment for alcoholism in a General Universitary Hospital.

It would be important to define these five subgroups cross-sectionally and describe how to assess them in order to maximize the results in pharmaceutical trials, psychotherapeutic research, and therapy for each alcoholic subtype. Future investigations should correlate our five subgroups with other typologies which have an assessment procedure like Babor’s, Cloninger’s, and Lesch’s.

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