Düşünen Adam The Journal of Psychiatry and Neurological Sciences 2014;27:233-241
DOI: 10.5350/DAJPN2014270306

Research / Araştırma

Obsessive Compulsive Disorder and Impulse Control Disorder Comorbidity and Evaluation of Impulsivity and Compulsivity in Alcohol Dependent Patients

Buket Belkiz Gungor[1], Rustem Askin[2], Ibrahim Taymur[1], Serap Sari[1]

[1]Psychiatrist, [2]Prof. Dr., Sevket Yilmaz Training and Research Hospital, Bursa - Turkey

ABSTRACT

Obsessive compulsive disorder and impulse control disorder comorbidity and evaluation of impulsivity and compulsivity in alcohol dependent patients

Objective: The aim of this study was to investigate the comorbidity of obsessive compulsive disorder and impulse control disorders in patients with alcoholism and evaluate the effects of impulsivity and compulsivity on the severity of alcohol dependence.

Methods: Using SCID-I, we investigated impulse control disorder (ICD) and obsessive compulsive disorder (OCD) in 81 male patients diagnosed with alcohol dependence. Impulsivity was evaluated using the Barratt Impulsiveness Scale (BIS-11). The Maudsley Obsessive Compulsive Inventory (MOCI) and the Michigan Alcoholism Screening Test (MAST) were used to evaluate compulsivity and severity of alcohol dependence, respectively.

Results: There was at least one ICD in 24.6% of the alcohol dependent patients. The most commonly encountered subtype was pathological gambling (16.0%) which was followed by intermittent explosive disorder (6.1%) and compulsive shopping (3.7%). 13.5% of the patients were diagnosed with OCD while OCD at a subclinical level was found in 19.8% of them. 46.9% of the patients presented either with "obsessive compulsive traits" or ICD or both.

Conclusion: In addition to the evaluation of impulsivity and compulsivity with using scales, OCD and ICD comorbidity was investigated in alcohol dependent patients. Together with the not otherwise specified impulse control disorders, at least one ICD was found in 24.6% of the addicts while 13.5% presented with OCD comorbidity.

Key words: Alcohol dependence, comorbidity, compulsivity, impulsivity

ÖZET

Alkol bağımlılığında obsesif kompulsif bozukluk ve dürtü kontrol bozukluğu ek tanısı ile dürtüsellik, kompülsivitenin değerlendirilmesi

Amaç: Bu çalışmada alkol bağımlısı bireylerde dürtü kontrol bozuklukları ve obsesif kompulsif bozukluk ek tanıları araştırılmış; aynı zamanda dürtüsellik ve kompülsivitenin alkol bağımlılığı şiddeti ile ilişkisi değerlendirilmiştir.

Yöntem: Çalışmamızda alkol bağımlılığı tanısı alan 81 erkek hastada SCID-I ile dürtü kontrol bozukluğu (DKB) ve obsesif kompulsif bozukluk (OKB) tanıları araştırıldı. Barratt İmpulsivite Ölçeği (BIS-11) ile dürtüsellik, Maudsley Obsesif Kompulsif Soru Listesi (MOKSL) ile kompülsivite, Michigan Alkolizm Tarama Testi (MATT) ile alkolizm şiddeti değerlendirildi.

Bulgular: Alkol bağımlısı bireylerin %24.6'sında en az bir DKB ek tanısı saptandı. En sık rastladığımız alttipi %16.0'lık oranla patolojik kumar oynama olurken, ikinci sıklıkta %6.1 oranıyla aralıklı patlayıcı bozukluk, üçüncü sırada %3.7 sıklıkta bulunan kompulsif alışveriş idi. Hastaların %13.5'i OKB tanısı alırken, %19.8'inde subklinik düzeyde OKB saptandı. Hastaların %46.9'undu 'obsesif kompulsif özellik' ya da DKB'den herhangi biri ya da her ikisi birden bulunmaktaydı.

Sonuç: Alkol bağımlılarında dürtüsellik ve kompülsivitenin ölçeklerle değerlendirilmesinin yanında OKB ve DKB ek tanıları da araştırıldı. BTA dürtü kontrol bozuklukları da eklendiğinde alkol bağımlılarının %24.6'sında en az bir DKB ve %13.5'inde OKB ek tanısı eşlik etmekteydi.

Anahtar kelimeler: Alkol bağımlılığı, ek tanı, kompülsivite, dürtüsellik

Address reprint requests to / Yazışma adresi:
Psychiatrist Buket Belkiz Gungor,
Sevket Yilmaz Training and Research Hospital
Bursa - Turkey

Phone / Telefon: +90-224-295-5000/3009

E-mail address / Elektronik posta adresi:
buket.gungor@yahoo.com

Date of receipt / Geliş tarihi:
May 18, 2013 / 18 Mayıs 2013

Date of acceptance / Kabul tarihi:
September 23, 2013 / 23 Eylül 2013

INTRODUCTION

Both impulsive and compulsive behaviors are seen in alcohol dependence. It has been suggested that, alcohol-dependent behaviors located between; excessive preoccupation with substance in order to ensure the presence of the substance and to provide it and being uncontrolled in blocking the uptake of substance (1). Impulsivity is the state of having tendency to show fast and unplanned reactions to internal or external stimuli disregarding negative consequences, a failure to resist an impulse or stimulus. As a personality dimension, it is a situation that, the individual can not prevent the request of harming to himself or others (2). A strong association between alcoholism and impulsive behavior has been identified (3). Impulsivity in alcohol addicts is associated with comorbid personality disorders. Impulsivity is also more common in alcohol addicts without comorbid personality disorder (4). Impulsivity has been suggested to be associated with intense substance use (5) and relapse (6). It has been found that, impulsive boys had a risk for developing alcohol dependence with advancing age (7). It has been found that, impulsivity was effective in the process from behavior of alcohol use up to development of alcohol dependency (8) and proportional to onset of alcohol use at early age (4).

Difficulty in limiting drinking in addiction, to continue substance despite recurrent problems, emergence of dysphoric affect when substance was not taken and disappearance of this situation after substance uptake can be likened to the compulsion (9).

It has been reported that, impulsivity was more dominant in the early stages of addiction and compulsivity was more dominant in the later periods (9). In a study comparing impulsivity and compulsivity in alcohol addicts with controls, alcohol addicts were more impulsive, there was no difference between the two groups in terms of compulsivity but in contrast to the control group, compulsivity did not decrease in the study group with age which has been suggested to be associated with the use of alcohol (1).

In pathological gambling, a subtype of impulse control disorder (ICD), while thrill seeking and impulsivity are predominant (10), harm avoidance was determined in obsessive-compulsive disorder (OCD) (11).

Due to alcohol dependence had both impulsive and compulsive characteristics, it has been considered that, ICD and OCD, which have these characteristics, can be found together with alcohol dependence. In this study, it was planned to investigate the presence of comorbid OCD and ICD in the patient group with a diagnosis of alcohol dependence, alcohol use properties in the groups with or without these comorbid diseases and to compare the severity of alcoholism with impulsivity and compulsivity.

METHOD

Our study is cross-sectional. Male inpatients or outpatients in the range 18-64 years, who were not under the influence of alcohol or withdrawal, were at least literate, diagnosed with alcohol dependence according to DSM-IV-TR diagnostic criteria, followed in the Izmir Ataturk Training and Research Hospital AMATEM (Alcohol and Drug Research, Treatment and Training Center) between March 2009 and July 2010, were included in the study. The patients with the additional diagnosis of bipolar disorder or psychotic disorders were excluded from the study, although they met these criteria. A total of 81 patients were enrolled. OCD was investigated with Structured Clinical Interview DSM-IV Axis I Disorders (SCID-I) in all cases. Subclinic OCD group with subthreshold symptoms diagnosed with OCD by SCID-I was named as 'obsessive-compulsive features' (OCF). ICD diagnosis of intermittent explosive disorder, kleptomania, pathological gambling, pyromania, trichotillomania and not otherwise specified (ICD-NOS) were performed according to DSM-IV criteria. The diagnosis of compulsive shopping, which is a ICD-NOS, was diagnosed according to the criteria of Mc Elroy et al. (12). This diagnosis, according to the criteria of which Turkish validity is not performed yet, was made taking into consideration the felt desire to do shopping, reduction in feelings of tension and feeling of pleasure after shopping, efforts to resist

shopping, having intrusive thoughts in the level of clinical significance. Skin picking, compulsive sexual behavior and compulsive exercise were questioned with the Minnesota Impulsive Disorders Interview Scale (MIDI). Barratt Impulsivity Scale (BIS-11), the Maudsley Obsessive Compulsive Questionnaire (MOCQ), the Michigan Alcoholism Screening Test (MAST) were given to the patients. In the form of socio-demographic data, the presence of alcoholism in the family, history of substance use, age at the first try of alcohol and age of problematic use, the daily amount of alcohol were questioned. In our study, problematic use of alcohol means that the age alcohol-related problems were seen or the first age of onset of regular drinking. In the calculation of standard daily drinks, in accordance with the accepted values in previous studies, it was accepted that 1 standard drink contains 12-14 g of ethanol, and 330 mL of a small bottle of beer, 140 mL glass of wine, 40 mL of a single vodka, whiskey, gin, raki were 1 (one) standard drink (13). The study was approved by the local ethics committee. The patients in the study group were informed about study characteristics, the scales, which were to be applied, and the consent form was obtained from each patient concerning that they want to participate in the study.

Measures

Clinical Interview Scale Configured for DSM-IV Axis I Disorders (SCID-I): SCID-I is a configured interview schedule practiced by clinicians for determination of Axis 1 diagnoses. SCID-I was translated to Turkish by Ozkurkcugil et al. (14) and the validity and reliability studies were performed.

Minnesota Impulsive Disorders Interview (MIDI): MIDI searches lifelong impulse control disorders (intermittent explosive disorder, pathological gambling, kleptomania, trichotillomania, pyromania, compulsive shopping, compulsive sexual behavior, compulsive exercise) according to DSM-IV criteria (15). The MIDI is a semi-configured interview form consisting of 36 items.

Barratt Impulsiveness Scale (BIS-11): BIS-11 is used for evaluating the impulsivity and filled by the patient (16). It consists of 30 items. Four different sub-scores are obtained in BIS-11. These are total score, motor impulsivity, attention impulsivity, non planning impulsivity. The patient's impulsivity level directly proportional to the total BIS-11 score. Turkish validity and reliability study of the BIS-11 were made by Gulec et al. (17) .

Maudsley Obsessive Compulsive Queistionnaire (MOCQ): MOCQ is used to measure the type and prevalence of obsessive-compulsive symptoms. It has been developed by Hodgson and Rachman (18). Validity and reliability study of the Turkish version were made by Erol et al. (19). It has subscales of checking, cleaning, slowness, doubting. Rumination subscale was added to the Turkish version of the scale. Cut-off score was not calculated in the study conducted in Turkey. It is recommended for use in comparative studies.

Michigan Alcoholism Screening Test (MAST): MAST is used whether the individual confronts from alcohol use problems and to measure the level. It has been developed by Gibbs (20). When the cut-off score is taken between 5-9, it contains 25 questions quering drinking problem, help-seeking behavior and alcohol-related losses, distinguishing the individuals with or without alcohol dependence in the best way. The reliability and validity of the Turkish version were made by Coskunol et al. (21).

Statistical Analysis

All statistical evaluations were performed by using SPSS for Windows 15.0 software. For comparing groups, chi-square test was used for categorical variables. For groups with and without ICD, with and without OCF, numeric variables were compared with One Way ANOVA, post hoc Tukey test was performed when $p<0.05$ was obtained. Multiple linear regression analysis was applied that MAST score measuring the level of alcohol use-related problems was taken as constant variable. In this model, impulsivity,

compulsivity and age of problematic use were taken as an independent variable. According to the results obtained from the model, the regression coefficient of each variable, standardized regression coefficients and significance level were calculated. Statistical significance level was accepted as $p<0.05$.

RESULTS

Eighty-one male patients were included in the study. Patients' demographic data, characteristics of alcohol use are given in Table 1. The mean age of patients is 48±9. Fourty patients (49.6%) were married, 41 patients (50.4%) were single, divorced or living separately. Fourty-three patients (53.1%) were primary school graduates, a history of alcoholism in first-degree relatives was detected in 31 of them (38.3%). The mean age for the first try of alcohol of the patients, the mean age of regular use of alcohol, the mean age of problematic use were found to be as 18.7±6.1, 28.2±9.6 and 37.7±10.2, respectively. The mean daily amount of standard drink is 23.9±11.5. Sixteen patients (19.8%) use regularly non-alcohol substance, and 3 (3.7%) have tried any substance, and have not used regularly.

24.6% of patients with alcohol dependence have at least one ICD (NOS also when BTA) as an additional diagnosis. The most common ICD was found to be pathological gambling with 16%, second in frequency was intermittent explosive disorder with 6.1%, third in frequency was compulsive shopping with 3.7%. It has been determined OCD in 13.5% of the patients and subclinical OCD which was not as the level to diagnose OCD in 19.8% of them. In total, 33.3% were classified as 'with obsessive-compulsive features'. 'Obsessive compulsive features' or one of the ICD or both were found in 46.9% of the patients.

Table 1: Socio-demographic and clinical characteristics of the patients involved in the study

	n/Mean±SD	%
Age	48.0±9.0	
Marital status		
Married	40	49.4
Single / Divorced / Separated	41	50.6
Education level		
Primary education	43	53.1
High school/University	38	46.9
Family history of alcoholism		
Yes	31	38.3
No	50	61.7
The age of first use of alcohol	18.7±6.1	
Age of regular use of alcohol	28.2±9.6	
Age of problemetic use of alcohol	37.7±10.2	
Daily standard drink	23.9±11.5	
Substance use		
Yes	16	19.8
Trial	3	3.7
No	62	76.5

Evaluation of groups with and without impulse control disorder (ICD), with or without obsessive-compulsive features (OCF) in terms of sociodemographic and clinical (BIS-11, MOCQ, MAST) variables

In a total of 81 alcohol-dependent patients, 9 patients with both OCF and ICD (group 1), 11 patients with only ICD (group 2), 18 patients with only OCF (group 3), 43 patients without OCF and ICD (group 4) were compared. There was no difference between the groups in terms of socio-demographic data (Table 2).

The groups were compared with one-way analysis of variance (ANOVA), the problematic use of age, MOCQ checking, MOCQ cleaning, MOCQ slowness, MOCQ doubting, MOCQ rumination and BIS attention scores were found to be significantly different. Followed by post hoc Tukey's test, MOCQ cleaning and doubting scores were not found to be significantly different. The problematic use of age was significantly smaller in the group with both ICD and OCF than the group without ICD and OCF and the group with OCF, $p(1.4)=0.03$; $p(1.3)=0.04$. In the group without ICD and OCF, MOCQ checking $p(4.1) = 0.02$; slowness $p(4.1)=0.04$ and rumination $p(4.1)\leq 0.001$ was significantly lower than the group with ICD and OCF. MOCQ rumination was significantly higher only in the group with ICD compared to the group without ICD and OCF $p(4.2)=0.03$. BIS-11 attention score was significantly higher in the group with both ICD and OCF than the group without ICD and OCF and the group only with ICF $p(1.4)<0.01$ and $p(3.1)<0.01$ (Table 3).

Evaluation with the regression analysis of the factors thought to affect the increase in the level of problematic alcohol use assessed with MAST

There was a significant correlation between MAST score and early age of alcohol use problems ($p\leq 0.001$) (Table 4).

Table 2: Evaluation of groups with and without impulse control disorder (ICD), with or without obsessive-compulsive features (OCF) in terms of socio-demographic variables

	(ICD+OCF+)		(ICD+OCF-)		(ICD- OCF+)		(ICD-OCF-)		χ^2	p
	n	%	n	%	n	%	n	%		
Marital status										
Marrried	6	7.4	7	8.6	4	4.9	23	28.3	7.57	0.056
Single/Divorced/Seperated	3	3.7	4	4.9	14	17.2	20	24.6		
Education level										
Primary	5	6.1	7	8.6	8	9.8	23	28.3	0.10	0.078
High school/University	4	4.9	4	4.9	10	12.3	20	24.6		
Family history of alcoholism										
Yes	5	6.1	2	2.4	4	4.9	20	24.6	6.21	0.102
No	4	4.9	9	11.1	14	17.2	23	28.3		

Table 3: Evaluation of groups with and without impulse control disorder (ICD), with or without obsessive-compulsive features (OCF) in terms of clinical variables

	(ICD+OCF+)	(ICD+OCF-)	(ICD- OCF+)	(ICD-OCF-)	F	p
Age	46.1±12.3	48.2±9.3	46.6±10.7	48.5±7.6	0.298	0.82
The age of first use of alcohol	16.7±3.2	16.0±3.5	21.2±9.0	18.7±5.3	2.082	0.10
Age of regular use of alcohol	24.1±7.6	28.0±10.7	28.2±9.6	29.4±9.9	0.760	0.52
Age of problematic use of alcohol	28.5±7.6	39.5±8.2	39.2±9.6	38.5±10.7	2.926	0.03
Daily standard drink	28.1±9.7	24.0±10.0	26.6±13.0	22.5±11.7	0.575	0.63
MAST	37.1±8.2	31.0±13.6	30.0±6.5	28.8±7.8	2.286	0.08
MOCI checking	4.8±3.2	37.0±2.4	3.7±2.6	2.2±2.3	3.774	0.01
MOCI cleaning	5.8±3.6	5.9±2.6	4.8±2.3	4.0±2.0	2.790	0.04
MOCI slowness	3.1±1.8	2.4±1.2	2.3±1.6	1.7±1.1	2.754	0.04
MOCI doubting	4.1±1.7	4.4±0.9	4.2±1.6	3.3±1.4	2.729	0.05
MOCI rumination	6.2±1.6	5.1±1.7	4.7±2.4	3.1±2.3	6.917	<0.001
BIS-11 attention	19.4±3.9	15.4±3.4	13.5±4.1	14.4±4.6	4.858	<0.001
BIS-11 motor	21.8±4.9	20.7±5.4	18.8±3.8	18.8±3.8	1.504	0.22
BIS-11 non planning	28.5±3.7	25.2±5.2	24.8±4.8	24.8±4.8	1.745	0.16

F: One Way ANOVA, MOCI: Maudsley Obsessive Compulsive Inventory, MAST: Michigan Alcoholism Screening Test, BIS-11: Barratt Impulsiveness Scale

Table 4: Evaluation with the hierarchical multiple linear regression analysis the factors thought to affect the increase in the level of problematic alcohol use assessed with MAST

Independent variables	Regression Coefficient	t	p
Age of problematic use of alcohol	-0.314	-3.068	<0.001
MOCI checking	0.127	0.239	0.81
MOCI cleaning	-0.323	-0.626	0.53
MOCI slowness	-1.541	-2.013	0.06
MOCI doubting	-0.060	0.083	0.93
MOCI rumination	1.066	1.924	0.05
BIS-11 attention	-0.096	-0.339	0.73
BIS-11 motor	0.257	1.056	0.29
BIS-11 non planning	0.211	1.033	0.30

Adjusted R^2=0.274, F=4.314, p<0.001, MOCI: Maudsley Obsessive Compulsive Inventory, MAST: Michigan Alcoholism Screening Test, BIS-11: Barratt Impulsiveness Scale

DISCUSSION

The most important result of this study is determining the additional diagnosis of ICD in one quarter of male patients diagnosed with alcohol dependence and showing that, OCD was found in one third of patients with the collection of OCD and subclinic OCD.

Core symptoms of dependence; to continue the behavior despite adverse consequences, loss of control, craving, dealing with the behavior in a compulsive manner. The discussion that, whether dependence is a compulsive or impulsive disease, continues (9).

In our study, at least one additional diagnosis of ICD was accompanied to 24.6% of the patients with a diagnosis of alcohol dependence. It has been reported in another study evaluating the frequency of ICD in psychiatric patients receiving inpatient treatment, ICD was found in 30% of patients and one in four of them was pathological gambling (22). In our study, the most common ICD was pathological gambling with 16%, the second and third ones were found to be intermittent explosive disorder and compulsive shopping with 6.1% and 3.7%, respectively. It has been determined in a study investigating the additional diagnosis of ICD in patients with depression, intermittent explosive disorder was in the first rank with of 31.3%, second and third ranks were pathological skin picking and compulsive shopping with 28% and 14%, respectively (23). Pathological gambling is suggested to be more common in those with substance use disorder (24). It has been reported in a study evaluating the additional diagnosis of alcohol and substance dependence in pathological gambling, this ratio was 63.3%, alcohol dependence formed the highest rate among dependence (25). It has been reported that, pathological gambling had overlapping features with dependencies and pathological gambling was a form of behavioral addictions (26).

In 13.5% and 19.8% of 81 patient, OCD and sub-threshold symptoms of OCD were detected. The patients diagnosed with OCD and subclinical OCD were grouped as 'with obsessive-compulsive features'. 'With obsessive-compulsive features', which is found in 33.3% of the patients, is quite high compared with the general population (1.0-5.7%) (27). In Epidemiologic Catchment Area study, lifetime alcohol use disorders has been identified in 24% of patients with a diagnosis of OCD (28). The presence of OCD comorbidity has been reported three times more common in alcohol addicts than in the general population (29). Early onset of OCD has been found to increase the likelihood of development in alcohol dependence (29). It has been proposed that, there was an interaction which may predispose to the development of each other between OCD and dependence (30). In OCD and dependence, inability to control the problematic behaviors although it is known to be false is a common feature (31).

The patient ratio that the additional diagnoses of OCF and ICD were seen together was 11.1%. As in our study, the coexistence of OCF and ICD are consistent with studies conducted in this regard (32,33). It was found in a study evaluating the additional diagnosis of ICD in OCD, ICD comorbidity accompanied in 35.5% of patients and alcohol use disorder was seen at the same time in 7 of 10 patients with both OCD and ICD (32). In a study evaluating the coexistence of intermittent explosive disorder and OCD, comorbidity was reported to be 22% (33). In our study, the intermittent explosive disorder and the compulsive shopping were detected in 18.5% and 11.1% of patients with additional diagnosis of OCF, respectively. The other ICD's were less in number. In a study in South America similar results were found, the intermittent explosive disorder, compulsive shopping were determined as the most common ICD among the patients with OCD (34). Pathological skin picking was reported to be quite common in patients with OCD as an ICD (35). It was found in the comorbidity of ICD and OCD that, OCD started at an earlier age, the severity and unresponsiveness to treatment were higher in OCD (34).

In the group of ICD, compulsivity was found to be higher in the group without comorbidity in MOCQ rumination subscale. In a study conducted by Lawrence et al. comparing the patients diagnosed with alcohol dependence and pathological gambling to healthy controls, compulsivity was evaluated with the Padua Inventory (36) and being more pronounced in alcohol

addicts, control subscale has been found more compulsive in patients with pathological gambling (37). It has been reported that, there were both impulsive and gambling-related obsessive thoughts in pathological gambling (38). It has been determined that, pathological gambling occured with the triggering of the distressing impulses in a compulsive manner (39) and compulsivity was seen at high rates compared to controls (40). It has been determined that, the severity of illness before the treatment was associated with impulsivity and compulsivity in pathological gambling and the scores of impulsivity and compulsivity significantly decreased after the treatment (41).

BIS-11 attention score in the group that, the additional diagnoses of ICD and OCF seen together, was significantly higher than the group without comorbidity and with only additional diagnosis of OCF. Other than this, impulsivity did not differ between groups. In the studies evaluating the impulsivity in patients with OCD, a positive correlation between impulsivity and compulsivity was detected (42,43) and cognitive impulsivity has been reported to be high (44). In another study, a relationship was determined between the presence of sexual and aggressive obsessions and high impulsivity in patients with OCD (45).

In the group that ICD and OCF comorbidity seen, the age of problematic use was significantly lower than the groups without comorbidity and with only OCF. This suggests that, an increase in the burden of psychopathology may lead to alcohol use at earlier ages.

Determination of significant relationship between MAST score measuring the level of alcohol use-related problems and problematic use at early age is consistent with studies on this subject (46,47).

The most important limitation of the study is that the sample is not large enough and only male alcohol addicts were included in the study. A study with similar pattern including both gender may allow us to compare the impulsivity and compulsivity. Men and women with heavy alcohol use were compared, impulsivity was found to be less in women than men due to higher behavioral inhibition and reward response in women (48). Although men report alcohol-related problems, that they are facing, lesser than women, compulsive drinking was reported to be higher in men alcohol addicts than women (49).

Impulsivity and compulsivity were evaluated in alcohol addicts and their relationship was assessed from multiple perspectives by investigating the diagnoses of OCD and ICD. Identification of the common characteristics of OCD, ICD and dependence will provide obtaining the sides overlapping in the prevention and treatment of these diseases. The follow-up study, which will be conducted on the patients with any of these mental diseases, can provide to determine that which one of them is premise, which one of them is a secondary disorder added to primary psychopathology and the common features of these disorders.

REFERENCES

1. Ketzenberger KE, Forrest L. Impulsiveness and compulsiveness in alcoholics and nonalcoholics. Addict Behav 2000; 25:791-795.
2. Moeller FG, Barratt ES, Dougherty DM, Schmitz JM, Swann AC. Psychiatric aspects of impulsivity. Am J Psychiatry 2001; 158:1783-1793.
3. Graham JR, Strenger VE. MMPI characteristic of alcoholics: a review. J Consult Clin Psychol 1988; 56:197-205.
4. Rubio G, Jiménez M, Rodriguez-Jimenez R,Martinez I, Avil C, Ferre F, Jiménez-Arriero MA, Ponce G, Palomo T. The role of behavioral impulsivity in the development of alcohol dependence: a 4-year follow-up study. Alcohol Clin Exp Res 2008; 32:1681-1687.
5. Lane SD, Cherek DR, Rhoades HM, Pietras CJ, Tcheremissine OV. Relationships among laboratory and psychometric measures of impulsivity: implications in substance abuse and dependence. Addict Disord Treat 2003; 2:33-40.
6. Miller L. Predicting relapse and recovery in alcoholism and addiction: neuropsychology, personality, and cognitive style. J Subst Abuse Treat 1991; 8:277-291.
7. Caspi A, Moffitt TE, Newman DL, Silva PA. Behavioral observations at age 3 predict adult psychiatric disorders. Longuitudinal evidence from a birth cohort. Arch Gen Psychiatry 1996; 53:1033-1039.
8. Simons JS. Differential prediction of alcohol use and problems: the role of biopsychological and social-environmental variables. Am J Drug Alcohol Abuse 2003; 29:861-879.

9. Koob GF. Neurobiological substrates for the dark side of compulsivity in addiction. Neuropharmacology 2009; 56 (Suppl 1):18-31.

10. Potenza MN, Steinberg MA, Skudlarski P, Fulbright RK, Lacadie CM, Wilber MK, Rounsaville BJ, Gore JC, Wexler BE. Gambling urges in pathological gambling: a functional magnetic resonance imaging study. Arch Gen Psychiatry 2003; 60:828-836.

11. Anholt GE, Emmelkamp PMG, Cath DC, van Oppen P, Nelissen H, Smit JH. Do patients with OC and pathological gambling have similar dysfunctional cognitions? Behav Res Ther 2004; 42:529-537.

12. McElroy SL, Keck PE Jr, Pope HG Jr, Smith JM, Strakowski SM. Compulsive buying: a report of 20 cases. J Clin Psychiatry 1994; 55:242-248.

13. Oner H, Tamam L, Levent BA, Oner S. Assestment of axis I and axis II comorbidities in hospitalized patients with alcohol dependence. Bull Clin Psychopharmacol 2002; 12:14-22. (Turkish)

14. Corapcioglu A, Aydemir O, Yildiz M, Esen A, Koroglu E. Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I), Clinical Version. Ankara: Hekimler Yayin Birligi, 1999. (Turkish)

15. Christenson GA, Faber RJ, de Zwaan M, Raymond NC, Specker SM, Ekern MD, Mackenzie TB, Crosby RD, Crow SJ, Eckert ED. Compulsive buying: descriptive characteristics and psychiatric comorbidity. J Clin Psychiatry 1994; 55:5-11.

16. Barratt ES, Hollander E, Cohen L, Simon L (editors) Barratt Impulsiveness Scale, Version 11 (BIS-11) Impulse-Control Disorders Measures: Handbook of Psychiatric Measures. Washington: American Psychiatric Publishing Inc., 2005, 691-693.

17. Gulec H, Tamam L, Gulec MY, Turhan M, Karakus G, Zengin M, Stanford MS. Psychometric properties of the Turkish version of the Barratt Impulsiveness Scale-11. Bull Clin Psychopharmacol 2008; 18:251-258. (Turkish)

18. Hodgson RJ, Rachman S. Obsessional-compulsive complaints. Behav Res Ther 1977; 15:389-395.

19. Erol N, Savasir I. Maudsley Obsessive Compulsive Queistionnaire. XXIV. National Psychiatry and Neurology Congress, Proceeding Book, 1988, 107-114. (Turkish)

20. Gibbs LE. Validity and reliability of the Michigan alcoholism screening test: a review. Drug Alcohol Depend 1983; 12:279-285.

21. Coskunol H, Bagdiken I, Sorias S, Saygili R. Validation study of Michigan Alcohol Screening Test. Ege Journal of Medicine 1995; 34:15-18. (Turkish)

22. Grant JE, Levine L, Kim D, Potenza MN. Impulse control disorders in adult psychiatric inpatients. Am J Psychiatry 2005; 162:2184-2188.

23. Annagur BB, Tamam L. Comorbidity of impulse control disorders among patients with major depression. Arch Neuropsychiatry 2011; 48:22-30. (Turkish)

24. Rupcich N, Frisch GR, Govoni R. Comorbidity of pathological gambling in addiction treatment facilities. J Subst Abuse Treat 1997; 14:573-574.

25. Kruedelbach N, Walker HI, Chapman HA, Haro G, Mateu C, Leal C. Comorbidity on disorders with loss of impulse-control: pathological gambling, addictions and personality disorders. Actas Esp Psiquiatr 2006; 34:76-82. (Spanish)

26. Wareham JD, Potenza MN. Pathological gambling and substance use disorders. Am J Drug Alcohol Abuse 2010; 36:242-247.

27. Angst J. Comorbidity of anxiety, phobia, compulsion and depression. Int Clin Psychopharmacol 1993; 8 (Suppl 1):21-25.

28. Anthony JC, Helzer JE. Syndromes of Drug Abuse and Dependence. Psychiatric Disorders in America: The Epidemiologic Catchment Area Study. 1991; 116-154.

29. Mancebo MC, Grant JE, Pinto A, Eisen JL, Rasmussen SA. Substance use disorders in an obsessive compulsive disorder clinical sample. J Anxiety Disord 2009; 23:429-435.

30. Tukel R, Alkin T (editors). Anxiety Disorders. Publication of Turkish Psychiatry Association. First ed. Ankara: 2006, 551-552. (Turkish)

31. London ED, Ernst M, Grant S, Bonson K, Weinstein A. Orbitofrontal cortex and human drug abuse: functional imaging. Cereb Cortex 2000; 10:334-342.

32. Fontenelle LF, Mendlowicz MV, Versiani M. Impulse control disorders in patients with obsessive- compulsive disorder. Psychiatry Clin Neurosci 2005; 59:30-37.

33. McElroy SL, Soutullo CA, Beckman DA, Taylor P Jr, Keck PE Jr. DSM-IV intermittent explosive disorder: a report of 27 cases. J Clin Psychiatry 1998; 59:203-210.

34. du Toit PL, van Kradenburg J, Niehaus D, Stein DJ. Comparison of obsessive-compulsive disorder patients with and without comorbid putative obsessive-compulsive spectrum disorders using a structured clinical interview. Compr Psychiatry 2001; 42:291-300.

35. Potenza MN, Koran LM, Pallanti S. The relationship between impulse-control disorders and obsessive-compulsive disorder: a current understanding and future research directions. Psychiatry Res 2009; 170:22-31.

36. Burns GL, Keortge SG, Formea GM, Sternberger LG. Revision of the Padua Inventory of obsessive compulsive disorder symptoms: distinctions between worry, obsessions, and compulsions. Behav Res Ther 1996; 34:163-173.

37. Lawrence AJ, Luty J, Bogdan NA, Sahakian BJ, Clark L. Impulsivity and response inhibition in alcohol dependence and problem gambling. Psychopharmacology (Berl) 2009; 207:163-172.

38. Blanco C, Potenza MN, Kim SW, Ibáñez A, Zaninelli R, Saiz-Ruiz J, Grant JE. A pilot study of impulsivity and compulsivity in pathological gambling. Psychiatry Res 2009; 167:161-168.

39. Potenza MN, Leung HC, Blumberg HP, Peterson BS, Fulbright RK, Lacadie CM, Skudlarski P, Gore JC. An FMRI Stroop task study of ventromedial prefrontal cortical function in pathological gamblers. Am J Psychiatry 2003; 160:1990-1994.

40. Blaszczynski A. Pathological gambling and obsessive compulsive spectrum disorders. Psychol Rep 1999; 84:107-113.

41. Blanco C, Grant J, Potenza MN. Impulsivity and compulsivity in pathological gambling. San Juan: College on Problems of Drug Dependence; 2004.

42. Stein DJ, Mullen L, Islam MN, Cohen L, DeCaria CM, Hollander E. Compulsive and impulsive symptomatology in tricotillomania. Psychopathology 1995; 28:208-213.

43. Potenza MN. Impulsivity and compulsivity in pathological gambling and obsessive-compulsive disorder. Rev Bras Psiquiatr 2007; 29:105-106.

44. Ettelt S, Ruhrmann S, Barnow S, Buthz F, Hochrein A, Meyer K, Kraft S, Reck C, Pukrop R, Klosterkötter J, Falkai P, Maier W, Wagner M, Freyberger HJ, Grabe HJ. IImpulsiveness in obsessive-compulsive disorder: results from a family study. Acta Psychiatr Scand 2007; 115:41-47.

45. Stein DJ, Hollander E, Simeon D, Cohen L. Impulsivity scores in patients with obsessive–compulsive disorder. J Nerv Ment Dis 1994; 182:240-241.

46. Ellickson PL, Tucker JS, Klein DJ. Ten-year prospective study of public health problems associated with early drinking. Pediatrics 2003; 111:949-955.

47. Warner LA, White HR. Longitudinal effects of age at onset and first drinking situations on problem drinking. Subst Use Misuse 2003; 38:1983-2016.

48. Hamilton KR, Sinha R, Potenza MN. Hazardous drinking and dimensions of impulsivity, behavioral approach, and inhibition in adult men and women. Alcohol Clin Exp Res 2012; 36:958-966.

49. Dawson DA, Grant BF. Gender effects in diagnosing alcohol abuse and dependence. J Clin Psychol 1993; 49:298-307.