Original

Lara Grau-López[1,2]
Constanza Daigre[1,2]
Laia Grau-López[3]
Laia Rodriguez-Cintas[1,2]
Ángel Egido[1]
Miquel Casas[1,2]
Carlos Roncero[1,2]

Administrative prevalence of insomnia and associated clinical features in patients with addiction during active substance use

[1]Sección de Adicciones y Patología Dual, Vall d'Hebron. Hospital Universitario Vall Hebron. Universitat Autònoma de Barcelona. Agencia de Salud Pública de Barcelona

[2]Departamento de Psiquiatría, Hospital Universitario Vall d'Hebron. Universitat Autònoma de Barcelona. CIBERSAM

[3]Departamento de Neurociencias, Hospital Universitario Germans Trias i Pujol

Introduction. A bidirectional relation between substance use and insomnia has been described, although there are few studies examining insomnia in the population of people with addiction. The aim of this study was to describe the prevalence of insomnia during active substance use in patients with addiction and its associated clinical features.

Patients and Methods. Descriptive study in patients diagnosed with substance dependence disorder admitted to a Hospital Detoxification Unit. The existence of insomnia prior to admission was assessed using the Oviedo Sleep Questionnaire (OSQ). Demographic variables, consumption-related clinical variables, and diagnostic variables were collected and the SCID-I and -II (Structured Clinical Interview for DSM-IV) and CAADID (Conners' Adult ADHD Diagnostic Interview for DSM-IV) were administered to evaluate the psychiatric diagnoses. Bivariate and multivariate analyses were made of the data.

Results. 481 patients (72.6% men, age 40.6±10.1 years) were enrolled. 64.3% of the patients reported insomnia during active substance use. The most common type of insomnia was fragmented nocturnal sleep (49.9%). The factors significantly associated with insomnia were polysubstance drug use, medical comorbidities (most notably, infectious diseases), anxiety disorder, personality disorder (particularly cluster C), a greater number of previous admissions for detoxication, and early age at onset of substance use.

Conclusions. Insomnia is highly prevalent in patients with addiction during active use of the substance. Fragmented nocturnal sleep was the most common type of insomnia. Patients with addiction and comorbid anxiety disorder, medical comorbidity, and early onset of dependence were more likely to experience insomnia.

Key words: Addiction, Insomnia, Active consumption, Hospital detoxification unit, Fragmented nocturnal sleep, Anxiety

Prevalencia administrativa del insomnio en pacientes adictos durante el consumo activo de las sustancias y características clínicas asociadas

Introducción. Se ha descrito una relación bidireccional entre el uso de sustancias y el insomnio, aunque existen escasos estudios sobre el insomnio en la población adicta. El objetivo es describir la prevalencia de insomnio durante el consumo activo de las sustancias en pacientes adictos y sus características clínicas asociadas.

Pacientes y Metodología. Estudio descriptivo en pacientes diagnosticados de trastorno por dependencia de sustancias que ingresaron en una Unidad Hospitalaria de Desintoxicación. Se evaluó el insomnio previo al ingreso mediante el Cuestionario de Oviedo de Calidad del Sueño (COS). Se recogieron variables demográficas, clínicas referidas al consumo y diagnósticas y se realizaron las entrevistas SCID-I y II y CAADID para evaluar los diagnósticos psiquiátricos. Se realizó un análisis bivariante y multivariante de los datos.

Resultados. Se incluyeron 481 pacientes (72,6% varones, edad 40,6±10,1 años). El 64,3% de los pacientes refirieron insomnio durante el consumo activo de la sustancia. El tipo de insomnio más frecuente fue el sueño nocturno fragmentado (49,9%). Los factores relacionados significativamente con el insomnio fueron policonsumidores, comorbilidad médica (destacando enfermedades infecciosas), trastorno de ansiedad, trastorno de personalidad (destacando cluster C), mayor número de ingresos de desintoxicación previos y edad de inicio del consumo más temprana.

Conclusiones. El insomnio es muy prevalente en pacientes adictos durante el consumo activo de la sustancia.

Correspondence:
Lara Grau-López MD PhD
Servicio de Psiquiatría. CAS de Vall Hebron
Hospital Universitario Vall d´Hebron
Passeig Vall d´hebron 119-129
08035 Barcelona, Spain
Tel.: +34934893880
E-mail: lgrau@vhebron.net

El sueño nocturno fragmentado es el tipo de insomnio más frecuente. Los pacientes adictos con trastorno de ansiedad comórbido, comorbilidad médica e inicio precoz de la dependencia tienen mayor probabilidad de presentar insomnio.

Palabras clave: Adicción, Insomnio, Consumo activo, Unidad de desintoxicación hospitalaria, Sueño nocturno fragmentado, Ansiedad

INTRODUCTION

Insomnia is a sleep disorder that is defined, following the diagnostic criteria of the International Classification of Sleep Disorders,[1] as difficulty falling asleep, difficulty in staying asleep for as long as desired, waking up too early, or having poor quality sleep, despite having good circumstances for a restful sleep. In addition, during the day patients must have at least one of the following symptoms: fatigue, daytime sleepiness, diminished motivation and initiative, disturbances of attention, concentration or memory, irritability or other mood alterations, impaired social or occupational functioning, physical symptoms such as stress, headache or gastrointestinal disturbances, and concerns or thoughts about insomnia.

In the general population, the prevalence of insomnia ranges from 20% to 35%,[2-6] and in patients diagnosed with psychiatric disorders other than addiction it ranges from 40% to 90%.[7-10] The relation between insomnia and drug addiction is bidirectional, since patients with substance use have a higher prevalence of insomnia than the general population, and people who have insomnia are more likely to develop substance use disorders.[11-13] However, the prevalence of insomnia in patients with addiction is only partially known because it is difficult to objectify its alterations in this population since sleep can be influenced by the type of substance used, the duration of substance use, the amount consumed, the route of administration, the state of intoxication or withdrawal from the substance, and the simultaneous use of depressant or stimulant substances. In studies made in patients with addiction, the prevalence of insomnia differs depending on the substance used, ranging from 30% to 85% depending on the primary substance of abuse.[14-18] Most studies have been made in patients with alcohol dependence, in which the prevalence of insomnia has been reported as 30% to 60%.[19-21]

In the general population, it has been reported that women, people over 65, and people who work shifts or at night are more likely to have insomnia.[22-24] It also has also been reported that patients with medical comorbidity and comorbid psychiatric disorders are more likely to have nocturnal sleep disorders.[25,26]

Although some studies have analyzed the relevance of insomnia in patients with addiction and it has been observed that insomnia negatively influences the evolution of addiction,[27,28] insomnia risk factors have not been described in patients with drug dependence.

The objectives of this study were to describe the prevalence of insomnia in patients with drug dependence during active use of the substance, and to compare the sociodemographic, clinical and psychopathological characteristics in relation to the presence of insomnia. It is hypothesized that insomnia is frequent in patients with addiction and that patients with addiction and insomnia have more psychiatric comorbidity and more severe addiction.

METHODS

A descriptive, cross-sectional and retrospective study was conducted in patients diagnosed with substance dependence disorder admitted to the Hospital Detoxification Unit of Vall d'Hebron University Hospital from June 2008 until May 2013.

The inclusion criteria were: presence of substance dependence disorder according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), admission to the hospital detoxification unit, and a signed informed consent for the study that has been previously approved by the hospital ethics committee. Patients who requested voluntary discharge during admission and those who could not collaborate in the general interview due to a major language barrier or associated severe cognitive impairment were excluded. The patients were not financially compensated for participating in the study.

Assessment variables and instruments

- Recording of variables designed *ad hoc* for monitoring patients in the Drug Dependence Unit of Vall d'Hebron: sociodemographic variables, substance use-related clinical variables, and diagnostic variables related with medical and psychiatric comorbidity.

- Insomnia: Insomnia during active substance use was evaluated, i.e. it was retrospectively examined for the month prior to admission, to assess the situation of sleep under the effects of the drugs used. The Oviedo Sleep Questionnaire (OSQ),[29] which is a hetero-applied, semistructured interview to provide diagnostic assistance for insomnia and hypersomnia type sleep disorders, was used to investigate sleep disturbances in the month prior to admission. The items are grouped into three subscales: subjective satisfaction with sleep, insomnia, and hypersomnia. Different types of insomnia are differentiated, including difficulties falling asleep (taking more than half an hour to fall asleep at night), fragmented nocturnal sleep (waking up more than twice in the course of the night), early awakening (wak-

ing up one hour before the usual time), and poor sleep quality (an insomnia corresponding to none of the previous types, but during the day the person claims to have rested badly overnight).

-   SCID-I (Structured Clinical Interview for DSM-IV – Axis I Disorders)[30.]
-   SCID-II (Structured Clinical Interview for DSM-IV - Axis II Personality Disorders)[31]
-   CAADID (Conners' Adult ADHD Diagnostic Interview for DSM-IV) is used to establish the diagnosis of attention deficit hyperactivity disorder (ADHD).
-   Tests for the detection of toxins: the results of urinalysis and the alcohol test on the first day of admission were recorded.

Procedure

On the first day of admission to the hospital detoxification unit, a general medical history was obtained that included an assessment of nocturnal sleep using the Oviedo Sleep Questionnaire (OSQ) to diagnose whether the patient had experience insomnia in the month prior to admission in the hospital detoxification unit, i.e., during active use of the substance. A psychopathological assessment was also made and the respective detoxification treatment was started.

Statistical Analysis

Descriptive statistics (mean, standard deviation, frequency tables) of the main variables was performed. Bivariate analysis of the data was subsequently made. The Chi square test was used to compare categorical variables and the Student t test for continuous variables when two groups were compared. A multivariate analysis was made with the variables that were significantly associated with insomnia in bivariate analysis. Thus, to assess the independent effect of each of the variables, logistic regression analysis was made using the *Enter* method. The data were collected and analyzed using SPSS version 18.0. In all the cases, statistical significance was set at $P<0.05$.

RESULTS

Sample description

During the recruitment period, 552 patients were admitted to the Hospital Detoxification Unit of Hospital Vall d'Hebron. Of these, 60 asked for voluntary discharge and 21 did not cooperate in the study due to language barriers or associated cognitive impairment, so they were excluded from the study. Therefore, the final sample consisted of 481 patients who were admitted in the study period.

The sociodemographic, clinical and therapeutic variables of the sample are shown in Table 1. The main substances involved, by order of frequency, were: alcohol (42.4%), cocaine (32.8%), opiates (12.9%), cannabis (7.1%), and benzodiazepines (4.8%). The patients used multiple substances in 46.4% (addiction to more than three substances throughout life).

On analysis of the Oviedo Sleep Questionnaire, it was observed that during active substance use, 84.3% (n=399) of patients had insomnia.

Insomnia was present during active substance use in 78.3% (n=18) of the patients admitted for benzodiazepine detoxification, in 70.6% (n=144) admitted for alcohol detoxification, in 69.4% (n=43) admitted for heroin detoxification, in 62% (n=98) admitted for cocaine detoxification, and in 47.1% (n=16) admitted for cannabis detoxification.

The most frequent type of insomnia during active substance use in patients with addiction was fragmented nocturnal sleep (49.9%), followed by difficulty falling asleep (34.9%), poor quality of nocturnal sleep (26.6%), early awakening (25.2%), and overall insomnia (11.9%).

Results depending on insomnia-related factors

The factors related to insomnia during active use of the substance in the month prior to hospital admission are described in Table 2.

In the univariate analysis it was found that patients with addiction and insomnia during active substance use more frequently had polydrug use (50.4% *vs* 37%, *P*=.01), medical comorbidity (66% *vs* 48.6%, *P*=.001), anxiety disorder (18.5% *vs* 8.9%, *P*=.01), personality disorder (49.3% *vs* 34.2%, *P*=.002), had required a greater number of previous admissions for detoxification (55.2% *vs* 44.5%, *P*=.03), and were younger at the onset of the earliest substance use (17.3 ± 5.5 years *vs* 21.9 ± 8.1 years, *P*=.03) than in patients without insomnia (Table 2).

Multivariate analysis showed that patients with medical comorbidity and anxiety disorder comorbidity had twice the risk of developing insomnia than patients with addiction without these comorbidities. Likewise, it was also observed that early age at first use was associated independently with the possibility of developing insomnia during active use of substances (Table 3).

DISCUSSION

This study shows that the prevalence of insomnia is high during active substance use (84.3%). It is worth noting that in patients with addiction the prevalence of insomnia is higher than in the general population, in which the preva-

Lara Grau-López, et al.

Administrative prevalence of insomnia and associated clinical features in patients with addiction during active substance use

Table 1	Sample description

	Total (n = 481)		Total (n = 481)
SOCIODEMOGRAPHIC VARIABLES			
Age (years)	40.9±10.3	Occupational activity (work)	16.2%
Gender (men)	72.3%	Marital status (married)	33.1%
Nationality (foreign)	9.8%	Cohabitation (own family)	34.1%
Education (primary studies)	66.7%	Legal background (prison)	20.6%
CLINICAL VARIABLES RELATED WITH COMORBIDITY			
Medical history	60.7%	Axis II	44.7%
Psychiatric History	62.2%	PD – Cluster B	28.7%
Axis I	43.7%	PD Mixed	5.6%
Anxiety disorder	15.6%	PD – Cluster C	4.8%
Depressive disorder	14.1%	PD not specified	3.7%
ADHD	13.1%	PD – Cluster A	1.9%
Psychotic disorder	8.5%	Insomnia active substance use	84.3%
Bipolar disorder	3.1%		
CLINICAL VARIABLES RELATED WITH SUBSTANCE USE			
Age at onset of substance use	17.8±6.4	Polysubstance drug use	46.4%
Age of onset of dependence	24.1±8.2	Pre-admission use	55.3%
Years of evolution of addiction	16.6±11.3	Positive admission alcohol test	25.2%
Substance motivating admission:		Positive admission urinalysis	55.9%
Alcohol	42.4%		
Cocaine	32.8%		
Heroin	12.9%		
Cannabis	7.1%		
Benzodiazepines	4.8%		
THERAPEUTIC VARIABLES OF ADDICTION			
Previous psychiatric admissions	15.6%	Psychotherapy	46.4%
Previous detoxification admissions	52%	Duration of stay (days)	10.9±3.2
PD: personality disorder			

lence of insomnia disorder has been reported to range from 20% to 35%,[2-6] and is similar to that of patients diagnosed with other psychiatric disorders.[7-10,32-34] Furthermore, the results of this study indicate a similar prevalence of insomnia to that found in other studies in patients with addiction.[14-21] Most previous studies have been conducted in patients with alcohol dependence, in which the prevalence of insomnia is reported to range from 35% to 75% of patients.[14-17] In patients with dependence on other substances, the prevalence of insomnia is partially known and may vary depending on the substance consumed (75%-85% with opiates, 76% with cannabis, 70% with psychostimulants, and 50% with benzodiazepines).[18-21]

Fragmented nocturnal sleep was the most common type of insomnia in the patients with addiction evaluated (50%). Canellas and Lecea (2012) also report that fragmented nocturnal sleep is the most common type of insomnia in patients with addiction, attributing this phenomenon to the interaction between the hypocretinergic and dopaminergic system.[11] It has been reported that alcohol and cannabis

Lara Grau-López, et al.

Administrative prevalence of insomnia and associated clinical features in patients with addiction during active substance use

Table 2	Factors associated with insomnia during active substance use		
	Insomnia (n = 399)	No insomnia (n = 82)	P
SOCIODEMOGRAPHIC VARIABLES			
Age (years)	40.9±9.7	41.1±11.5	0.86
Gender (men)	71.9%	73.3%	0.76
Nationality (foreign)	10.7%	7.5%	0.28
Education (primary studies)	32.8%	34.2%	0.76
Occupational activity (work)	16.7%	15.1%	0.65
Marital status (married)	31.6%	36.3%	0.32
Cohabitation (own family)	31.9%	39%	0.13
Legal background (prison)	22.4%	16.4%	0.14
CLINICAL VARIABLES			
Medical history	*66%*	*48.6%*	*0.001[a]*
Axis I	45.4%	39.7%	0.25
Anxiety disorder	*18.5%*	*8.9%*	*0.01[a]*
Depressive disorder	15.5%	11%	0.19
ADHD	13.7%	11.6%	0.53
Psychotic disorder	7.5%	11%	0.21
Bipolar disorder	3%	3.4%	0.80
Axis II	*49.3%*	*34.2%*	*0.002[a]*
PD – Cluster B	30.7%	24%	0.13
PD Mixed	6.3%	4.1%	0.34
PD – Cluster C	6%	2.1%	0.06
PD not specified	4.2%	2.6%	0.54
PD – Cluster A	2.1%	1.4%	0.59
VARIABLES RELATED WITH SUBSTANCE USE			
Age at onset of substance use	*17.3±5.5*	*21.9±8.1*	*0.03[a]*
Age at onset of dependence	23.9±7.8	24.8±9.1	0.31
Time of evolution of dependence	16.7±10.8	16.3±12.5	0.75
Substance motivating admission:			
Alcohol	44.8%	37%	0.11
Cocaine	31.3%	36.3%	0.29
Heroin	12.8%	13%	0.96
Cannabis	5.7%	10.3%	0.07
Benzodiazepines	5.4%	3.4%	0.36
Polysubstance drug use	*50.4%*	*37%*	*0.006[a]*
Previous psychiatric admissions	15.5%	15.8%	0.95
Previous detoxification admissions	*55.2%*	*44.5%*	*0.03[a]*
Preadmission use before abstinence	56.7%	52.1%	0.34
Positive admission alcohol test	28.1%	23.5%	0.31
Positive admission urinalysis	57.6%	52.1%	0.26

[a] = p<0.05

Lara Grau-López, et al.

Administrative prevalence of insomnia and associated clinical features in patients with addiction during active substance use

Table 3	Variables independently associated with insomnia during active substance use		
Insomnia active substance use	OR	95% IC	p
Medical history	1.99	1.32–3.01	0.001[a]
Age at onset of substance use	0.95	0.92-0.98	0.003[a]
Anxiety disorders	2.08	1.08-4.02	0.03[a]
Personality disorder	1.56	1.01-2.41	0.07
Polysubstance drug use	1.44	0.94-2.22	0.09
Previous detoxification admissions	1.18	0.77-1.79	0.46
[a] = p<0.05			

dependence disorders are more frequently associated with fragmented nocturnal sleep.[35,36] Thus, Brower et al. (2011) reported in patients with alcohol dependence that this substance produced an increase in REM sleep, causing a greater number of nocturnal awakenings.[35] Bolla et al. (2008) reported that patients with cannabis dependence have more nocturnal awakenings and poor quality of nocturnal sleep.[36]

In multivariate analysis, the factors independently associated with insomnia in patients with addiction were comorbid anxiety disorder, comorbid medical conditions, and early onset of addiction.

It has been reported that insomnia is highly prevalent in patients diagnosed with anxiety disorders and that it can even be among the diagnostic criteria of some anxiety disorders, such as post-traumatic stress disorder or generalized anxiety disorder.[37,38] For this reason, it is relevant to hypothesize that patients with addiction and comorbid anxiety disorder are more vulnerable to developing insomnia during active substance use and possibly during periods of withdrawal.

Patients with addiction and comorbid medical conditions also were more likely to have insomnia in this study. This result is consistent with previous studies in other populations without addiction, in which it was found that the presence of medical conditions changed the quality of nocturnal sleep. In a review by Tjepkema (2005), the presence of medical conditions, especially neurological conditions like epilepsy, or respiratory conditions like asthma or obstructive sleep apnea syndrome, could induce insomnia.[25]

Early age at the onset of use was also independently associated with the probability of having insomnia during active use of the substance. It seems reasonable to think that the early onset of substance use is associated with a higher probability of developing insomnia, understanding that the greater the exposure to a substance, the greater the likelihood that patients will experience insomnia.[13]

In bivariate analysis, other variables associated with insomnia in patients with addiction were comorbid personality disorders, polysubstance drug use, and requiring more previous admissions.

Several studies have shown that personality disorders or maladaptive personality traits are associated with a higher prevalence of insomnia.[39,40] Atalay (2011) observed a significant association between the prevalence of insomnia and different groups of personality disorders, especially disorders of personality cluster A and personality cluster C.[39] De Carvalho et al. (2003) conducted a study in patients with insomnia and found that the personality traits most associated with insomnia were those of cluster C (feelings of insecurity and rumination) [40] All these findings coincide with those of the present study, in which patients with addiction and personality disorders were found to have a greater likelihood of presenting insomnia, and patients with addiction and cluster C personality disorder showed a tendency to present insomnia.

Polysubstance drug use has also been associated with the presence of insomnia during active consumption, probably due to the interaction originated by the different substances that the patient uses. Patients with addiction who have required previous admissions for detoxification are also more likely to have insomnia. Both factors are considered criteria for serious use that may indicate a worse outcome of the addiction disorder, just as the fact of presenting insomnia has also been associated with a worse outcome of the addiction.[27]

Consideration should be given to certain limitations of the study. In first place, it should be noted that the assessment of the presence of insomnia did not include electrophysiological tests, such as polysomnography or actigraphy. However, it has been reported that electrophysiological tests should be performed as a second-line choice[41] because the diagnosis of insomnia disorder is essentially clinical, relying on taking the patient's medical history and corroborating it with self- or hetero-applied questionnaires when the insomnia is documented retrospectively, or by nocturnal sleep diaries when a prospective study is made.

Another limitation of this study is that it did not have a control group and the information was collected cross-sectionally and retrospectively, so the results should be interpreted with caution. In addition, the use of anxiolytic or hypnotic medication by patients was not controlled, although it can be expected that a significant proportion of patients use these drugs without a prescription.[42] Finally, it was not possible to study the influence of polysubstance drug use on the presence of insomnia in patients with addiction because, even though this study uses a large sample of patients, the sample was heterogeneous and conclusive results regarding patients with single substance use, double substances or polysubstance drug use could not

Lara Grau-López, et al.

Administrative prevalence of insomnia and associated clinical features in patients with addiction during active substance use

be extracted, given the small sample size of some of the groups.

The strengths of this study were the large sample of patients assessed thoroughly using psychometric tests, which lends validity to the clinical diagnosis and presence of insomnia. Very few studies have described the prevalence of insomnia in a heterogeneous sample of patients with addiction, since most studies have been conducted only in patients with alcohol dependence. Also, to our knowledge, there are few studies of the factors related with insomnia in patients with addiction, despite being a concern and a frequent motive for consultation in this population.[42]

Insomnia is common in patients with addiction, especially fragmented nocturnal sleep. There are also variables associated with insomnia, such as medical comorbidity, co-morbid anxiety disorders, and the early onset of substance use, that suggest a greater clinical complexity of patients with substance dependence and insomnia. Psychotherapeutic strategies and pharmacological approaches to detecting and correcting insomnia should be developed and deployed, as this disorder is a common concern in patients and could lead to an increased likelihood of early recurrence of substance abuse.[28,42]

CONFLICTS OF INTEREST

The authors of this article state that they have no conflict of interest.

ACKNOWLEDGMENTS

REFERENCES

1. The International Classification of Sleep Disorders. Revised. Diagnostic and coding manual. 2nd. Rochester, Minnesota: American Sleep Disorders Association; 1997.
2. Buysse DJ. Insomnia. JAMA. 2013;309(7):706-16.
3. Roth T, Jaeger S, Jin R, Kalsekar A, Stang PE, Kessler RC. Sleep problems, comorbid mental disorders, and role functioning in the national comorbidity survey replication. Biol Psychiatry. 2006;60(12):1364-71.
4. Peraita-Adrados R. Advances in sleep disorders. Rev Neurol. 2005;40(8):485-91.
5. Leger D, Guilleminault C, Dreyfus JP, Delahaye C, Paillard M. Prevalence of insomnia in a survey of 12,778 adults in France. J Sleep Res. 2000;9(1):35-42.
6. Ohayon MM, Sagales T. Prevalence of insomnia and sleep characteristics in the general population of Spain. Sleep Med. 2010;11(10):1010-8.
7. Sutton EL. Psychiatric Disorders and Sleep Issues. Med Clin North Am. 2014;98(5):1123-43.
8. Abad VC, Guilleminault C. Sleep and psychiatry. Dialogues Clin Neurosci. 2005;7(4):291-303.
9. Lucchesi LM, Pradella-Hallinan M, Lucchesi M, Moraes WA. [Sleep in psychiatric disorders]. Rev Bras Psiquiatr. 2005;27(1):27-32 .
10. Fritsch Montero R, Lahsen Martínez P, Romeo Gómez R, Araya Baltra R, Rojas Castillo G. Sleep disorders in the adult population of Santiago of Chile and its association with common psychiatric disorders. Actas Esp Psiquiatr. 2010;38(6):358-64.
11. Cañellas F, de Lecea L. [Relationships between sleep and addiction]. Adicciones. 2012;24:287-90.
12. Roth T. Does effective management of sleep disorders reduce substance dependence? Drugs. 2009;69:65-75.
13. Teplin D, Raz B, Daiter J, Varenbut M, Tyrrell M. Screening for substance use patterns among patients referred for a variety of sleep complaints. Am J Drug Alcohol Abuse. 2006;32:111-20.
14. Vitiello MV. Sleep, alcohol and alcohol abuse. Addiction Biology. 1997;2:155-8.
15. Brower KJ, Aldrich MS, Hall JM. Polysomnographic and subjective sleep predictors of alcoholic relapse. Alcohol Clin Exp Res. 1998;22(8):1864-71.
16. Crum RM, Ford DE, Storr CL, Chan YF. Association of sleep disturbance with chronicity and remission of alcohol dependence: data from a population-based prospective study. Alcohol Clin Exp Res. 2004;28(10):1533-40.
17. Irwin MR, Valladares EM, Motivala S, Thayer JF, Ehlers CL. Association between nocturnal vagal tone and sleep depth, sleep quality, and fatigue in alcohol dependence. Psychosom Med. 2006;68(1):159-66.
18. Dimsdale JE, Norman D, DeJardin D, Wallace MS. The effect of opioids on sleep architecture. J Clin Sleep Med. 2007;3(1):33-6.
19. Schierenbeck T, Riemann D, Berger M, Hornyak M. Effect of illicit recreational drugs upon sleep: Cocaine, ecstasy and marijuana. Sleep Med Rev. 2008;12(5):381-9.
20. Gates PJ, Albertella L, Copeland J. The effects of cannabinoid administration on sleep: a systematic review of human studies. Sleep Med Rev. 2014;18(6):477-87.
21. Curran HV, Collins R, Fletcher S, Kee SC, Woods B, Iliffe S. Older adults and withdrawal from benzodiazepine hypnotics in general practice: effects on cognitive function, sleep, mood and quality of life. Psychol Med. 2003;33(7):1223-37.
22. Regal AR, Amigo MC, Cebrián E. [Sleep and women]. Rev Neurol. 2009;49(7):376-82.
23. Romero O. [Insomnia in the elderly: cognitive involvement and therapeutic attitudes]. Rev Neurol. 2000;30(6):591-3.
24. Sierra JC, Delgado-Dominguez C, Carretero-Dios H. [Internal structure of Dysfuncional Beliefs and Attitudes about Sleep Scale in a Spanish shift workers sample]. Rev Neurol. 2006;43(8):454-60.
25. Tjepkema M. Insomnia. Health Rep. 2005;17(1):9-25.
26. Sutton EL. Psychiatric Disorders and Sleep Issues. Med Clin North Am. 2014;98(5):1123-43.
27. Brower KJ, Aldrich MS, Robinson EA, Zucker RA, Greden JF. Insomnia, self-medication, and relapse to alcoholism. Am J Psychiatry. 2001;158(3):399-404.
28. Grau-López L, Roncero C, Grau-López L, Daigre C, Rodriguez-Cintas L, Pallares Y, et al. Factors related to relapse in substance-dependent patients in hospital detoxification: the relevance of insomnia. J Sleep Disor Treat Care. 2014;3:3.
29. García-Portilla M, Sáiz PA, Díaz-Mesa EM, Fonseca E, Arrojo M, Sierra P, et al. [Psychometric performance of the

Lara Grau-López, et al.

Administrative prevalence of insomnia and associated clinical features in patients with addiction during active substance use

Oviedo Sleep Questionnaire in patients with severe mental disorder]. Rev Psiquiatr Salud Ment. 2009;2(4):169-77.

30. Spitzer R, Robert L, Gibbon M. SCID-I, Versión clínica, entrevista clínica estructurada para los trastornos del eje I del DSM. Barcelona: Masson; 1996.

31. First M, Gibbon M, Spitzer R. SCID-II, Entrevista Clínica Estructurada para los trastornos de personalidad del Eje II del DSM-IV. Barcelona: Masson; 2003.

32. Park SC, Kim JM, Jun TY, Lee MS, Kim JB, Jeong SH, et al. Prevalence and Clinical Correlates of Insomnia in Depressive Disorders: The CRESCEND Study. Psychiatry Investig. 2013;10(4):373-81.

33. Sylvia LG, Dupuy JM, Ostacher MJ, Cowperthwait CM, Hay AC, Sachs GS, et al. Sleep disturbance in euthymic bipolar patients. J Psychopharmacol. 2012;26(8):1108-12.

34. Monti JM, Monti D. Sleep in schizophrenia patients and the effects of antipsychotic drugs. Sleep Med Rev. 2004;8(2):133-48.

35. Brower KJ, Krentzman A, Robinson EA. Persistent insomnia, abstinence, and moderate drinking in alcohol-dependent individuals. Am J Addict. 2011;20(5):435-40.

36. Bolla KI, Lesage SR, Gamaldo CE, Neubauer DN, Funderburk FR, Cadet JL, et al. Sleep disturbance in heavy marijuana users. Sleep. 2008;31(6):901-8.

37. Cervena K, Matousek M, Prasko J, Brunovsky M, Paskova B. Sleep disturbances in patients treated for panic disorder. Sleep Med. 2005;6(2):149-53.

38. Germain A, Hall M, Krakow B, Shear KM, Buysse DJ. A brief sleep scale for Posttraumatic Stress Disorder: Pittsburgh Sleep Quality Index Addendum for PTSD. J Anxiety Disord. 2005;19(2):233-44.

39. Atalay H. Comorbidity of insomnia detected by the Pittsburgh sleep quality index with anxiety, depression and personality disorders. Isr J Psychiatry Relat Sci. 2011;48(1):54-9.

40. de Carvalho LB, Lopes EA, Silva L, de Almeida MM, Almeida e Silva T, Neves AC, et al. Personality features in a sample of psychophysiological insomnia patients. Arq Neuropsiquiatr. 2003;61(3A):588-90.

41. Ruiz C. Revisión de los diversos métodos de evaluación del trastorno de insomnio. Anales de psicología. 2007;23:109-17.

42. Roncero C, Grau-López L, Díaz-Morán S, Miquel L, Martínez-Luna N, Casas M. [Evaluation of sleep disorders in drug dependent inpatients]. Med Clin (Barc). 2012;138:332-5.