


Substance-related psychopathology and aggressiveness in a nightlife holiday resort: Results from a pilot study in a psychiatric inpatient unit in Ibiza

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Abstract

Objectives: We aimed to describe a sample of subjects admitted to a psychiatric unit after the intake of psychoactive substances for recreational purposes.

Methods: Between June and September 2015, 49 subjects were included. Sociodemographic characteristics and psychopathological aspects were investigated, and urine samples for further analysis were collected. Three subgroups (cannabinoids, stimulants, and depressors users) were identified, according to the structured interview regarding substance use and urinalysis.

Results: Level of aggressiveness was found to be significantly higher ($p < .05$) in the cannabinoids subgroup. Self-reported symptom severity was comparable among groups, but trends could be identified: SCL-90 results showed a prevalence of anxiety symptoms among depressors users, hostility or aggression in the tetrahydrocannabinol subgroup, and psychoticism in the stimulants subgroup.

Conclusions: The use of psychoactive substances was characterized by poly-use of both traditional and novel substances. The presence of aggressiveness emerged as a main feature associated with the use of cannabis and other cannabinoids. Binge drinking and sleep deprivation also represented a relevant component in almost all the evaluated subjects.

KEYWORDS

aggression, nightlife, novel psychoactive substances, psychopathology, substance abuse

1 | INTRODUCTION

Mental and substance use disorders are recognised as major contributors to the global burden of diseases (Degenhardt et al., 2013). Furthermore, it is known that dual diagnosis, in which co-occurring disorders affect each other and interact, is particularly common. However, among several proposed hypotheses, such as common factor models, secondary substance use disorder models, secondary psychiatric disorder models, and bidirectional models, the etiology of

dual diagnosis remains unclear in most cases (Mueser, Drake, & Wallach, 1998). On the other hand, the extent of problematic drug intoxications in specific clinical settings, such as psychiatric or emergency units, is not limited to subjects with substance use disorders or dual diagnosis, but it also includes occasional recreational drug users (National Centre for Education and Training on Addiction, NCETA Consortium, 2004). Recreational drug use is defined as any substance (legal, controlled, or illegal) with pharmacologic effects that is taken voluntarily for personal pleasure or satisfaction rather than for

medicinal purposes (Mosby's Dictionary of Medicine and Nursing and Health Professions, 2009). In recent years, in addition to "classic" substances of abuse, novel psychoactive substances (NPS) have emerged, determining a health issue of growing importance (Corazza et al., 2014; Martinotti et al., 2015; Santacroce et al., 2015; Schifano, Leoni, Martinotti, Rawaf, & Rovetto, 2003; Schifano et al., 2005). The term NPS had been legally defined by the European Union as a new narcotic or psychotropic drug, in pure form or in a preparation, that is not scheduled under the Single Convention on Narcotic Drugs of 1961 or the Convention on Psychotropic Substances of 1971 but which may pose a public health threat comparable to that posed by substances listed in those conventions (ONUDD, 2015). There is currently a relevant body of clinical evidence to demonstrate the potential acute and chronic health harms associated with the use of NPS, but often very little is known by both consumers and health care professionals (Martinotti et al., 2014; Simonato et al., 2013).

Holiday periods, in particular, seem to represent a risky time of excess and experimentation, especially for young people (Kelly, Hughes, & Bellis, 2014). Visiting a nightlife-focused holiday resort can submerge individuals in environments where hedonistic partying is the norm; drugs are typically heavily promoted and widely available, thus, globally increasing revellers engagement in health-endangering behaviours during their stay (Kelly et al., 2014). In this context, the Balearic Islands are surely among the most popular summer destinations in Europe: such an international and representative nightlife resort appears as a crucial key setting to address substance-related health problems. Preliminary studies conducted in Ibiza highlight that, in both young tourists and foreign casual workers, risk behaviours appear considerably exacerbated, including problematic alcohol use, drug use, complex polyabuse, and sexual risk taking (Bellis, Hughes, Bennett, & Thomson, 2003; Bellis, Hughes, Calafat, Juan, & Schnitzer, 2009; Hughes, Bellis, & Chaudry, 2004; Kelly et al., 2014). Anecdotal reports also warn that traffickers are playing with the lives of holidaymakers, which are being used as "guinea pigs" in the trialling of dangerous NPS (BBC, 2014; Daily Mail Online, 2014). Researchers suggest that specific health and safety measures are now required on an international and collaborative basis to protect people visiting holiday resorts (Bellis, Hale, Bennett, Chaudry, & Kilfoyle, 2000; Bellis, Hughes, & Lowey, 2002).

In this pilot study, part of a larger study investigating the use of traditional and NPS and their induced psychopathological symptoms, we aimed at (a) giving a psychopathological description of signs and symptoms of a sample of subjects admitted to the psychiatric unit after having reportedly used psychoactive substances and (b) correlating substance intake with levels of psychopathology and aggressiveness.

2 | METHODS

Between June 2015 and September 2015, 49 subjects consecutively referred to the Psychiatric Unit of Can Misses Hospital (Ibiza, Spain) were enrolled for the study. All the patients were evaluated by attending psychiatrists using the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) criteria. Inclusion criteria were being aged between 18 and 75 years; intake of psychoactive substances or more than five alcohol units during the previous 24 hr. Exclusion

criteria were the current presence of delirium tremens or hallucinosis at the moment of clinical interview (possible re-evaluation when clinical conditions improved); epilepsy; severe cardiac failure; diabetes mellitus; severe liver impairment; liver encephalopathy; kidney failure; neoplastic diseases; dementia; and other neurological diseases.

We investigated socioeconomic characteristics (age, gender, living status, job status, and level of education), alcohol use, and substance use (tobacco, caffeine, cannabis, stimulants, and depressors) with a particular focus on NPS. The NPS asked about were synthetic cannabinoids (spice drugs), synthetic cathinones (mephedrone, methylone, methylenedioxypyrovalerone, and alpha-pyrrolidinopentiophenone), methamphetamine (ice, shaboo, and crystal meth), Ayahuasca, phenethylamines (NBOMe, Fly, and Solaris), *Salvia divinorum*, Kratom, gamma hydroxybutyric acid, methoxetamine (Special M), and desomorphine (krokodil). The following psychometrics were administered at both admission (T0), according to the clinical conditions of the patient, and discharge (T1): TLFB (timeline follow-back for psychoactive substances and alcohol); PANSS (Positive and Negative Symptoms Scale); SCL-90 (Symptom checklist 90); YMRS (Young Mania Rating Scale); HAM-D (Hamilton Depression Scale); HAM-A (Hamilton Anxiety Scale); MOAS (Overt Aggression Scale); C-SSRS (Columbia Suicide Severity Rating Scale). TLFB was used to identify the main substance of abuse for each subject; the other psychometrics were necessary to explore different psychopathological aspects, such as depressive or manic symptoms, anxiety, somatic complaints, aggressiveness, and suicidality. A urine sample was collected at T0, stored at -30°C , and subsequently analysed. Urinalysis was performed at the admission of the patient in the psychiatric unit. When no substance was identified, it was possible to hypothesise (a) the presence of a psychoactive not identified by common analytics; (b) the use of a substance with a short half-life, or (c) the consumption of a substance more than 24 hr before evaluation. We divided the subjects into three subgroups according to the TLFB, the structured interview regarding substance use, and the urinalysis. Data collection was carried out in an anonymous and confidential way; all participants received a detailed explanation of the design of the study, and written informed consent was systematically obtained from every subject, according to the Declaration of Helsinki. Ethics approval was granted by the University of Hertfordshire Health and Human Sciences ECDA, protocol no. aPHAEC1042(03); by the CEI Illes Balears, protocol no. IB 2561/15 PI; and by the University "G.d'Annunzio" of Chieti-Pescara, no. 7/09-04-2015. The data were securely stored and made accessible only by the research team members. Data from TLFB, SCL-90, MOAS, and C-SSRS are analysed in this study. The results of the other psychometric scales will be presented elsewhere. Baseline data were analysed using descriptive statistics, including means and standard deviations, and frequencies and percentages. Kruskal-Wallis test was performed to investigate differences in aggression (MOAS) and self-reported symptoms (SCL-90) between groups. SPSS version 18.0 was used to perform all analysis.

3 | RESULTS

The sociodemographic data of the sample are reported in Table 1. One of the subjects was excluded from further data analysis as a large part

TABLE 1 Sociodemographic characteristics of the sample

Characteristic	n	%		
Sample size	49			
Gender				
Male	33	67.3		
Female	16	32.7		
Nationality				
Spanish	26	54.2		
Others	10	20.8		
British	8	16.7		
Italian	3	6.3		
German	1	2.1		
Educational level				
Higher education/ undergraduate	12	37.5		
Secondary education	8	25		
Primary education	6	18.8		
Higher education/ postgraduate	6	18.8		
Working status				
Worker/professional	23	51.1		
Unemployed	21	46.7		
Student	1	2.2		
Marital status				
Single/never married	27	64.3		
Divorced	10	23.8		
Married	5	11.9		
Living status				
With parents	12	26.7		
With a partner	12	26.7		
Alone	8	17.8		
With partner and child/children	7	15.6		
With friends/flatmates	6	13.3		
	Range (years)	Mean (years)	Standard deviation	
Age	21–63	33.49	8.52	
Total years of education completed	5–27	12.24	4.81	

of the psychometrics results were lacking. We divided the remaining sample (48 subjects) into three subgroups according to the TLFB, the structured interview regarding substance use, and the urinalysis. Although multiple substance abuse was subjectively reported by 67.4% of the patients, focusing on the TLFB and the urinalysis results, it was possible to approximately consider a main substance of abuse for each subject. The three subgroups included 21 cannabinoids users, 17 stimulant users (including cocaine, amphetamines or methamphetamines, and synthetic cathinones), and 10 downers or depressors users (including benzodiazepines, barbiturates, and alcohol).

Urinalysis highlighted the presence of polysubstance abuse in a high percentage of subjects (60.4%). There was an adequate correspondence between the results of the urinalysis and the substance declared by the patients (TLFB). Subjects were allocated to each subgroup (stimulants, cannabinoids, and depressors) if the

substance self-declared as the main psychoactive of abuse was actually identified by the urinalysis. The inclusion in each subgroup was therefore determined by both urine drug screen and TLFB results (see Table 2 for urinalysis details).

The psychiatric diagnosis mostly associated to each subgroup are described in Table 3.

Level of aggressiveness was significantly higher, $H(2) = 7.07$, $p = .026$, in the group of subjects taking cannabinoids (MOAS median value: 4.5) as their main and preferred substance, compared to stimulant users (MOAS median value: 0) and depressors or downers users (MOAS median value: 0).

Self-reported symptoms severity was comparable among groups, according to the SCL-90 results (Table 4). However, some trends could be identified: SCL-90 results showed a prevalence of anxiety symptoms in the group of downers or depressors users and hostility or aggression in the cannabinoids group and psychoticism in the stimulants subgroup.

Suicidality and previous attempted suicide were reported by 8 subjects, three belonging to the cannabinoids group, three to the stimulants group, and two to the depressors or downers group.

4 | DISCUSSION

To the best of our knowledge, this is the first study aimed at exploring psychopathological issues related to both “classical” and NPS in a psychiatric inpatient unit located in one of the most popular nightlife resorts, as Ibiza is during summer. In this pilot study, we analysed the data from a small pilot sample, which is part of a larger observational study.

Although in our sample a main “preferred” substance could be frequently identified, the presence of polysubstance abuse appears to be the norm (Bellis et al., 2003; Calafat et al., 2013). A wide range of psychoactives was reported both by users in the TLFB and by the urinalysis, with a prevalence of traditional ones. The use of NPS was confirmed by 20% of the evaluated subjects: This data is relevant,

TABLE 2 Drug screen urinalysis

Results	n	%
Total sample	48	100
Multiple substances	29	60,4
Single substance	12	25
No substance	8	16,6
Results (per substance)		
Benzodiazepines	20	41,6
Cannabinoids	15	31,2
Cocaine	8	16,6
Opiates	6	12,5
Amphetamines	4	8,3
Methamphetamines	4	8,3
Gabapentinoids	1	2
Barbiturates	1	2

Note. High prevalence of benzodiazepines in the sample is mainly due to acute drug administration at the admission.

TABLE 3 Psychiatric diagnosis by substance subgroups (assessed with TLFB/urinalysis)

Substance	<i>n</i>	Psychotic ep.	Manic ep.	Depressive ep.	Depressive ep. with psychotic features	Mixed ep.	Psychomotor agitation in borderline personality disorder
Cannabinoids	21	10	4	1	-	-	2
Stimulants	17	10	1	1	2	-	-
Depressors	10	4	2	1	-	1	-

Note. TLFB = timeline follow-back for psychoactive substances and alcohol.

TABLE 4 SCL-90 results by substance subgroups

Primary symptom dimension	Cannabinoids (<i>n</i> = 13)			Stimulants (<i>n</i> = 11)			Depressors (<i>n</i> = 8)			Chi-Square	Asymp. Sig.
	Mean rank	Mean	Std. dev.	Mean rank	Mean	Std. dev.	Mean rank	Mean	Std. dev.		
Somatization	16,19	12,54	8,88	18,45	16,64	13,90	14,31	11,38	10,69	,930	,628
Obsessive-compulsive	17,96	17,15	8,90	14,82	14,36	11,91	16,44	14,50	7,70	,672	,715
Interpersonal sensitivity	17,85	14,15	8,14	18,50	14,27	8,22	11,56	9,13	4,45	3,002	,223
Depression	18,69	24,38	10,27	15,41	20,09	14,63	14,44	18,50	14,13	1,249	,536
Anxiety	16,92	16,00	10,87	17,45	14,73	9,93	14,50	13,50	9,94	,506	,776
Hostility	19,58	8,92	6,72	15,14	5,73	4,71	13,38	5,13	5,79	2,551	,279
Phobic anxiety	16,15	5,46	6,13	16,05	4,82	3,79	17,69	5,88	4,73	,174	,917
Paranoid ideation	17,58	10,77	5,74	17,45	11,64	8,44	13,44	8,50	3,85	1,148	,563
Psychoticism	15,65	11,62	10,57	18,09	13,82	11,20	15,69	10,00	7,05	,484	,785
Total	17,81	177,22	72,78	16,41	130,18	85,02	14,50	109,38	63,42	,617	,734

given that this is a real-life sample composed mostly of holidaymakers, among whom “2.0 online psychonauts” do not represent the classical phenotype. Psychonautics (from the Greek ψυχή [“soul” or “mind”] and ναύτης [“sailor”]) refers to a way of exploring consciousness and psychic phenomena in which the researcher voluntarily seeks for altered mind states, primarily via the use of psychedelics (Newcombe, 2008). Modern “2.0 on-line psychonauts” may have a high-standard pharmacological and technical knowledge and tend to form online communities, free from real-world constraints, in order to share their interests and experiences (Davey, Schifano, Corazza, & Deluca, 2012). However, it is important to consider that some of the newest psychoactive substance have not been reported by our sample, neither self-declaring their use (TLFB) nor resulting from the urinalysis. This is not consistent with data from scientific literature, according to which the emergence of new substances is in a continuous development, and their diffusion is growing (Cinosi et al., 2014; Schifano et al., 2005; Zawilska & Andrzejczak, 2015). This could be partly explained by the nature of the sample included in the study, mainly composed of holidaymakers. Indeed, the use of NPS in peculiar club settings (e.g., gay-friendly nightlife venues) appears to be particularly prevalent, (Measham, Wood, Dargan, & Moore, 2011), but this may not to be true in all nightlife scenes (Vento et al., 2014).

Novel psychoactive substances use is not an independent category: It is common in individuals using “traditional” substances such as cocaine, cannabis, and alcohol, as an add-on strategy. This is mostly driven by the will to experiment with an increasing number of molecules and to discover how they interact with each other, modulating or potentiating their effects (Baumeister, Tojo, & Tracy, 2015).

In this study, the presence of aggressiveness emerged as a main feature associated with the use of cannabis and other cannabinoids.

This result is somewhat unexpected as, according to scientific literature, aggressiveness is rather diffused especially among stimulant users, and in particular synthetic cathinones and other novel compounds (Banjaw, Miczek, & Schmidt, 2006; Tomlinson, Brown, & Hoaken, 2016). Our hypothesis is that the typology of cannabis available on the market in Ibiza has probably an extremely high concentration of delta-9-THC, which in turn determines a stronger agonistic interaction with cannabinoid receptors (CB1; Di Forti et al., 2009; Freeman et al., 2014). Moreover, the presence of synthetic cannabinoids (SC), which may be full agonists, or even super agonists at the CB1 receptors, cannot be ruled out. SC often have chemical structures that differ from the THC dibenzopyran: Indole-derived moieties, for instance, may be associated with serotonin receptors activation, contributing to the complexity of clinical and psychopathological phenomena observed in SC intoxication (Castaneto et al., 2014). The inverse relation between serotonin and human aggression has been recently revised, considering, as an example, other-reported aggression as “positively” correlated to serotonin functioning (Duke, Bègue, Bell, & Eisenlohr-Moul, 2013). Furthermore, early cannabis use has been implicated in the development of criminal behaviour (Niveau & Dang, 2003), and it has also been highly associated with maladaptive interpersonal functioning in social relationships (Vandrey, Budney, Kamon, & Stanger, 2005).

Polysubstance misuse has also demonstrated a stronger correlation with aggression in young substance misuser admitted to emergency departments, together with higher risks of unprotected sex, car and other accidents, violence, and victimisation (Goldstick et al., 2016; Delaveris, Teige, & Rogde, 2014). Positive urine drug screen results for cannabis has been associated with a higher incidence of inpatient agitation among patients admitted to a psychiatric

inpatient unit with a diagnosis of schizophrenia, schizoaffective disorder, or bipolar disorder (Johnson et al., 2016). This, consequently, increases the risks of workplace violence for psychiatry departments staff, mainly nurses and nursing assistants, as reported by a recent Italian study (Ferri, Silvestri, Artoni, & Di Lorenzo, 2016).

Binge drinking and sleep deprivation are issues that need to be considered, too: They represented indeed a relevant component in almost all the evaluated subjects. The data on binge drinking are consistent with the current findings of scientific literature, according to which binge drinking has showed to be a very common way of alcohol consumption, specifically among adolescents and young adults (Martinotti et al., 2016). Alcohol is also well known as a trigger for multiple aggressive behaviours, such as sexual assault (Abbey, 2002; Zinzow & Thompson, 2015) and self- and other-directed aggression (McCloskey & Berman, 2003; Miczek, DeBold, Hwa, Newman, & de Almeida, 2015). Sleep problems may be a causal factor in the development of reactive aggression and violence, too. The relation between sleep problems and aggression may be mediated by the negative effect of sleep loss on prefrontal cortical functioning. This most likely contributes to loss of control over emotions, including loss of the regulation of aggressive impulses to context-appropriate behaviour (Kamphuis, Meerlo, Koolhaas, & Lancel, 2012).

This pilot study presents limitations: Differentiating the groups according to the main abused substance (*depressors*, *stimulants*, and *cannabinoids*) is probably not completely correct, as multiple substance abuse was the predominant behaviour. The absence of significant differences among reported psychiatric symptoms at the SCL-90 may be explained by this arbitrary differentiation, which should be reformulated in future research.

Other limitations include (a) the ability to identify new substances in the urine sample is still complex and limited; (b) we did not consider in our analysis the intoxication cases managed at the emergency department and not admitted to the psychiatry unit; and (c) the long-term effects of NPS are still largely unknown and are difficult to be assessed without a consistent follow-up.

In future studies, the following points will be necessarily addressed: (a) try to better discriminate the psychopathological effects of specific substances, including NPS; (b) increase the sample in order to get a higher statistical power; (c) prospectively look at the long-term effects; (d) evaluate the possibility to develop a full-blown psychosis after a substance-induced psychosis and understand which factors may predict this transition; and (e) retrospectively observe which pharmacological treatments show a higher level of effectiveness.

In conclusion, in a small sample of subjects admitted to a psychiatric ward in a nightlife resort, the use of psychoactive substances resulted to be notable and characterised by poly-use of both traditional and novel substances. Aggressiveness was also significantly high, specifically in those reporting a recent use of cannabinoids as the main substance.

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