

Cannabis and Alcohol Abuse Among First Psychotic Episode Inpatients

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ABSTRACT

Background: Psychoactive substance abuse, which includes abuse of alcohol and street drugs, is common among first-episode psychosis patients, but the prevalence of cannabis abuse is particularly high. However, there have been very few reported studies concerning the occurrence of psychoactive substance abuse among first-episode psychotic individuals using standard toxicological testing. We study the prevalence of cannabis and alcohol abuse among first-psychotic-episode inpatients as well as compare the demographic, diagnostic, and psychopathological profiles of substance abusers versus nonusers.

Methods: Subjects were recruited from the Jerusalem Mental Health Center between 2012 and 2014. Ninety-one consecutively admitted psychiatric patients diagnosed using the DSM-IV criteria with a first psychotic episode due to schizophrenia, schizophreniform disorder, bipolar disorder, brief psychotic episode, and psychosis NOS disorder entered the study. The diagnoses of schizophrenia (all types), psychosis NOS disorder, brief psychotic episode, and schizophreniform disorder were categorized as “only psychosis” and those of bipolar disorder manic episode with psychotic features (congruent and incongruent) and severe depression with psychotic features were categorized as “predominantly affective symptoms.” Urine tests for tetrahydrocannabinol (THC) were performed during the first 48 hours of admission, and likewise self-report questionnaires were administered.

Alcohol abuse and dependence were diagnosed by self-report.

Results: Of the 91 subjects in the study, 49 (53.8%) did not abuse any illegal psychoactive substance. Twenty patients (22%) abused only cannabis; 14 (15.4%) abused cannabis and another psychoactive substance; 54 (59.3%) of the subjects reported no alcohol abuse; 33 (36.3%) reported occasional drinking (between two and ten times a month); and 4 (4.4%) reported continuous repeated drinking (more than ten times a month). There was no correlation between the demographic characteristics and the abuse of cannabis. Two-thirds of the “predominantly affective symptoms” subjects were positive for THC, whereas only a third of the “only psychosis” subjects screened positive for THC.

Conclusions: The percentage of cannabis and alcohol abuse in the study population is much higher than one would expect to see in the general Israeli population (according to the Knesset Research Department 7.6–10.2% of the adult Israeli population abuse cannabis). Different patterns of cannabis abuse among “predominantly affective” and “psychotic only” patients may lend credence to the preferential use of a specific substance per diagnosis.

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INTRODUCTION

Substance abuse among psychiatric inpatients is a widely recognized problem although the precise extent and origin of the phenomenon is still unclear. In the large-scale CATIE study done in the U.S., of the 1,460 participants, 23% abused substances and 37% had a substance abuse disorder (1). In a 2008 study in Israel, 470 consecutively admitted patients were evaluated (250 patients in the mental health center and 220 in the psychiatric department of a general hospital). Lifetime prevalence of drug abuse was found to be 24%, active abuse of substances (during the previous month) was 17.3%, and 28.2% of the active abusers used two or more substances (2).

Comorbid abuse has profound implications for the course and treatment of schizophrenia. Individuals diagnosed with schizophrenia who abuse drugs and alcohol tend to have poorer outcomes than their non-substance-using counterparts and substance abusers in the general population (3, 4). Cannabis is one of most abused illegal substances in the general population. Marijuana was found to be the most commonly used illicit drug in the United States (5). Recent emphasis has been on the possible causal links between cannabis and psychosis (6-8). In meta-analyses of the rate of cannabis abuse in general clinical samples of patients with schizophrenia (all types), the median current rate of cannabis abuse was 16.0% and the median lifetime rate was 27.1% (9). There is intense debate in the literature as to whether schizophrenia with pre-onset cannabis abuse disorder may be a distinct entity with specific features or whether cannabis abuse disorder can precipitate schizophrenia in genetically vulnerable subjects (10-12).

Psychoactive substance abuse, including abuse of alcohol and street drugs, is common among first-episode-psychosis patients, but the prevalence of cannabis abuse is particularly high and in some studies reached a rate of about 75.0% (13). Barnett et al. (14) studied lifetime and current substance abuse in an epidemiologically representative sample of people experiencing a first episode of clinically relevant psychosis in England. Results indicated that substance abuse among individuals with first-episode psychosis was twice that of the general population; cannabis abuse was reported in 51% of patients. Age at first use of cannabis as well as cocaine, ecstasy, and amphetamines was significantly associated with age at first psychotic symptom.

There is a high prevalence of substance abuse among persons suffering from early psychosis, with cannabis and alcohol featuring prominently (15). Contrary to other studies, in the prospective multisite study of people experi-

encing a first episode of psychosis carried out at four early intervention services in Ontario, Canada (16), prevalence rates between the first-episode sample and the general sample for lifetime cannabis use was similar (60% vs. 55%, respectively). The results of a research project in Milan, Italy, showed that 34.7% of first-episode schizophrenic patients had a lifetime history of substance abuse. In multisubstance abusers, cannabis was the substance used most frequently (49%), followed by alcohol (13%), and cocaine (4%) (17). In the above-mentioned meta-analysis (9), the median rate of cannabis abuse disorder was markedly higher in first-episode versus long-term patients (current 28.6%/22.0%, lifetime 44.4%/12.2%, respectively).

An association between psychoactive substance abuse and subsequent risk of psychosis has been documented repeatedly (6, 7, 18), but the interpretation of these data can lead to ambiguity. First, premorbid personality traits (i.e., early signs or symptoms of a mental disorder) might have predisposed individuals both to developing a psychosis and to seeking psychoactive substances. Second, abuse of psychoactive substances may be secondary to the emerging presence of a psychosis as a form of “self-medication” for treating symptoms (19). The “common factor” model proposes that psychiatric and substance-use disorders frequently co-occur due to underpinning shared biological, psychological, or social factors such as genetics, family history, antisocial personality disorder, childhood trauma, cognitive impairment, or low socioeconomic status (20). “Bidirectional” models hypothesize that either of the two disorders can increase vulnerability to the other (21), whereas personality models posit that comorbidity is related to individual differences in the stable trait-specific personality variables that underlie affective outcomes, coping strategies, and subsequent risk for substance use (22).

Results of our previous study (23) suggested that cannabis can produce an antidepressive and anxiolytic effect on psychotic and affective inpatients. This effect might partly explain the high level of comorbidity of psychosis and the exacerbation of certain manic symptoms in this group of patients. However, this explanation hardly covers all of the possible etiologies of the nature of comorbid substance abuse.

The availability and reliability of urine toxicology makes such a test a vital tool for optimal diagnosis and treatment of mental patients who underreport substance abuse (24). To the best of our knowledge, the occurrence of psychoactive substance abuse among first-episode psychotic individuals using standard toxicological testing in Israel has not been reported.

METHODS

Ninety-one consecutively admitted psychiatric patients diagnosed with a first psychotic episode due to schizophrenia, schizophreniform disorder, bipolar disorder, brief psychotic episode, or psychosis NOS disorder were recruited between the years 2012 and 2014 from the inpatient population of the Jerusalem Mental Health Center, which comprises a catchment area of approximately one million people. In order to facilitate further understanding of patterns of substance abuse in subgroups, schizophrenia (all types), psychosis NOS disorder, brief psychotic episode, and schizophreniform disorder were categorized as “only psychosis” and those of bipolar disorder manic episode with psychotic features (congruent and incongruent) and severe depression with psychotic features were categorized as “predominantly affective symptoms.” The patients were diagnosed by two certified psychiatrists (G. K. and Y. K.) in 2-day period after admission. Psychosis and cannabis and alcohol abuse were diagnosed using SCID-IV (25). Urine tests for THC, amphetamine, methamphetamine, and natural and synthetic opiates were performed during the first 48 hours of admission using Sure Step™ kits (Applied Biotech, Inc., San Diego). Active abuse of cannabis (during the last month prior to hospitalization) was registered according to urine tests and/or self-reports, and life-time abuse according to self-reports only. Alcohol abuse and dependence (active and life-time) were diagnosed by psychiatric history and self-report. In cases of combined cannabis-alcohol abuse (or dependence) cannabis was defined as the leading substance of abuse.

The study hypothesis was that there is an association between the occurrence of a first psychotic episode with cannabis abuse as well as with certain psychopathological features.

ETHICAL CONSIDERATIONS

Institutional Review Board approval was received from the Jerusalem Mental Health Center. Informed consent was obtained according to the Helsinki declaration. Patient anonymity was maintained using codes for all forms and test results.

STATISTICAL ANALYSIS

Lambda was calculated in order to examine bivariate associations between positive self-report of cannabis use and positive urine testing for THC. Additionally, demographics and DSM diagnosis were assessed for significant bivariate associations with cannabis and alcohol

abuse using Pearson's chi-square and analysis of variance (ANOVA). Data analyses were performed using SPSS/PC version 21.0. Two-sided tests of significance were used, with an alpha set at 0.05 in all analyses.

RESULTS

The distribution of the study population ($n = 91$) by demographics, DSM diagnostic criteria, and current abuse of cannabis (urine assay and self-report) and alcohol (self-report) is shown in Table 1. Among the study population 53 subjects (58.2%) did not use cannabis and 49 (53.8%) were negative for any illegal substances (negative self-report and urine assay); in 4 subjects (4.4%) use of the substances was unclear. A total of 20 subjects (22%) used only cannabis; 14 (15.4%) used cannabis and another psychoactive substance; 54 (59.3%) reported no alcohol use; 33 (36.3%) reported occasional drinking (between two

Table 1. Characteristics of Respondents, Current THC Abuse & Alcohol Use

Variables		Total	
		n	%
Gender	Male	76	83.5
	Female	15	16.5
Age (groups)	≤21	31	34.1
	22-26	28	30.8
	27+	32	35.2
	Mean (sd)	27.1 (9.2)	
Education (groups)	≤10	27	29.7
	11-12	51	56.0
	13+	13	14.3
	Mean (sd)	11.5 (2.4)	
Occupation	Professional	7	7.7
	Blue collar	16	17.6
	Non-professional	26	28.6
	Student	8	8.8
	Unemployed	27	29.7
	Unclear	7	7.7
Marital Status	Married	24	26.4
	Unmarried	67	73.6
Diagnosis according to DSM-4	Schizophrenia	6	6.6
	Acute psychotic episode	70	76.9
	Mania with psychotic features	12	13.2
	Severe depression with psychotic features	3	3.3
THC current abuse according to self-report & urine	No use	53	58.2
	Use only THC	20	22.0
	Use THC & other drugs	14	15.4
	Unclear	4	4.4
Alcohol use according to self-report	No use	54	59.3
	2-10 times per month	33	36.3
	More than 10 times per month	4	4.4

Table 2. The Association Between Self-Reported and Urine Testing for the Abuse of THC (n=87*)

	Urine				λ
	Negative (n=62; 73.1%)		Positive (n=25; 28.7%)		
	n	%	n	%	
Self-report					$\lambda = .695^{***}$
No use (n=53; 60.9%)	53	60.9	0	0.0	
Current use (n=34; 39.1%)	9	10.3	25	28.7	

*For four participants using THC was not clear

***p < .001

and ten times a month); and 4 (4.4%) reported continuous repeated drinking (more than ten times a month).

A cumulative 67% of the study population had a 3-year self-reported history of psychoactive substance abuse predating the first psychotic episode.

Table 2 demonstrates the association between self-report of cannabis abuse and positive urine testing for THC. One of the most unexpected findings was the high rate of agreement (89.7%) on cannabis abuse between self-reports and objective toxicology tests ($\lambda = .695$; $p < .001$).

The association between demographic variables and the abuse of cannabis (with or without self-report of alcohol

use) is shown in Table 3. No correlation was found between demographic characteristics and the abuse of cannabis. For six patients occupation was not determined and for four participants the abuse of THC was uncertain.

However, we found a statistically significant association between psychiatric diagnosis and active THC abuse ($\chi^2(1) = 5.8$; $p < .05$). A significantly high percentage (29.4%) of THC-positive subjects was diagnosed with “predominantly affective symptoms,” whereas among the THC negative subjects that was the case for only 9.4%. Two-thirds (10 out of 15) of those with “predominantly affective symptoms” were positive for THC, whereas only a third (24 out of 72) of the “only psychosis” subjects screened positive for THC.

Further, a statistically significant association was found between alcohol use and a positive urine THC finding: among cannabis abusers 76.5% were found to use alcohol, whereas only 20.8% of THC nonusers reported alcohol use ($\chi^2(1) = 26.3$; $p < .001$).

Demographic characteristics of subjects with respect to alcohol use, DSM diagnosis, and a THC use are shown in Table 4. Interestingly, no association was found between gender, level of education, marital status, and DSM diagnosis and the use of alcohol. Age, as a categorical variable, was found to be associated with alcohol use ($\chi^2(2) = 7.6$;

Table 3. Characteristics of Respondents & Alcohol Use according to Categories of the Current Abuse of THC (n=87*)

Variables		Total n=87*	No use n=53 Column %	Use n=34 Column %	F/ χ^2
Gender	Male Female	85.1% 14.9%	79.2% 20.8%	94.1% 5.9%	n.s
Age (groups)	≤21 22-26 27+	34.5 29.9 35.6	37.7 28.3 34.0	29.4 32.4 38.2	n.s
Mean (sd)		27.2 (9.4)	26.6 (9.4)	28.1 (9.4)	n.s
Education (groups)	≤10 11-12 13+	28.7 57.5 13.8	24.5 58.5 17.0	35.3 55.9 8.8	n.s
Mean (sd)		11.6 (2.3)	11.9 (2.2)	11.0 (2.5)	n.s
Occupation#	Professional Blue collar Non-professional Student Unemployed	8.6 19.8 30.9 8.6 32.1	11.8 15.7 29.4 13.7 29.4	3.3 26.7 33.3 0.0 36.7	n.s
Marital Status	Married Unmarried	25.3 74.7	28.3 71.7	20.6 79.4	n.s
Diagnosis according to DSM-4	Only psychosis (schizophrenia, acute psychotic episode) Predominately affective symptoms (mania with psychotic features, severe depression with psychotic features)	82.8 17.2	90.6 9.4	70.6 29.4	$\chi^2=5.8^*$
Alcohol use according to self-report	No use Current use	57.5 42.5	79.2 20.8	23.5 76.5	$\chi^2=26.3^{***}$

*For four participants using THC was not clear

#For seven participants occupation was not clear

n.s=not significant; *p < .05; ***p < .001

Table 4. Characteristics of Respondents according to Categories of using Alcohol (n=91)

Variables		Total n=91	No use n=54 Column %	Use n=37 Column %	F/ χ^2
Gender	Male Female	83.5% 16.5%	79.6% 20.4%	89.2% 10.8%	n.s
Age (groups)	≤21 22-26 27+	34.1 30.8 35.2	42.6 20.4 37.0	21.6 45.9 32.4	$\chi^2=7.6^*$
Mean (sd)		27.1 (9.2)	27.0 (9.4)	27.3 (9.2)	n.s
Education (groups)	≤10 11-12 13+	29.7 56.0 14.3	31.5 50.0 18.5	27.0 64.9 8.1	n.s
Mean (sd)		11.5 (2.4)	11.6 (2.6)	11.3 (2.1)	n.s
Occupation [#]	Professional Blue collar Non-professional Student Unemployed	8.3 19.0 31.0 9.5 32.1	12.0 12.0 32.0 16.0 28.0	2.9 29.4 29.4 0.0 38.2	$\chi^2=11.4^*$
Marital Status	Married Unmarried	26.4 73.6	31.5 68.5	18.9 81.1	n.s
Diagnosis according to DSM-4	Only psychosis (schizophrenia, acute psychotic episode)	83.5	88.9	75.7	n.s

$p < .05$), the essential difference occurring in the younger age group (18-21) in which there were fewer users than no-users. However, no statistically significant difference was found between the mean age of the “no use” of alcohol group and the “use” group.

Another statistically significant relationship was found between the type of occupation and the use of alcohol ($\chi^2(4) = 11.4$; $p < .05$). Approximately 60% of the “blue collar” subjects used alcohol. It is also important to note that in the group of alcohol users only 2.9% were with “professional” working background while in the “nondrinking” group they accounted for 12.0% ($\chi^2=11.4$). There were no students among the alcohol drinking group.

DISCUSSION

The abuse of psychoactive substances by psychotic individuals is well documented. However, there are many fewer data concerning the abuse of alcohol and psychoactive substances on admission due to an individual's first psychotic episode.

Our approach was to perform toxicological urine screening tests on 91 first-episode inpatients of the Jerusalem Mental Health Center, in addition to administering questionnaires. To the best of our knowledge, this is the first such study to be performed in Israel.

Ponizovsky et al. (26) have recently published findings relating to a decrease in dual diagnosis of severe mental illness and substance use disorders in Israel between 1996

and 2010 (e.g., dual diagnosis with drugs decreased from 8.2% in 1996 to 6% in 2010). However, that study was a retrospective epidemiologic survey using data from the Israel National Psychiatric Case Register and was not based on a prospective inpatient sample using active questioning, self-reports, and urine assays. Our findings as to the conclusions in that study suggest an underreporting of abuse perhaps due to a nondisclosure of the abuse of illegal substances and an underdiagnosis of abuse in the presence of acute psychosis on the part of the admitting psychiatrist.

Our results regarding comorbidity rates between first psychotic episode and cannabis/alcohol abuse are similar to those of other studies that have been performed elsewhere (27); however, the percentage of substance abusers in the study population is higher than one would expect in the general Israeli population (7.6%–10.2 % of adult Israeli population)(28).

One of the most interesting points in our findings was the fact that a cumulative 67% of the study population had a 3-year self-reported history of psychoactive substance abuse predating the first psychotic episode. Granted, there may be a common genetic predisposition that increases the risk that an individual will take psychoactive substances or develop a psychosis (29). However, the fact that such a significant percentage of the study population abused psychoactive substances months, even years, prior to the first episode demonstrates that the psychosis is not simply a direct primary outcome of the abuse. Though psychotic symptoms can indeed be seen in cases of psychoactive

substance intoxication and in cases of hallucinogen abuse, the symptoms found in our inpatient sample cannot be explained solely by the abuse.

Khantzian (30) has recently written that, “Notwithstanding the absence of empirical evidence, clinical observations (practice-based evidence) suggest that there is a considerable degree of preference/specificity for an individual’s drug-of-choice.”

We found an association between the DSM diagnosis and the type of psychoactive substance abused. Two-thirds (10 out of 15) of the “predominantly affective symptoms” subjects were found to be positive for THC, whereas only a third (24 of 72) of the “only psychosis” subjects were using THC. This finding may indicate the preferential use of a specific substance per diagnosis that Khantzian has proposed. Other researchers, including Arendt, found some evidence that cannabis is used as a means of self-medication for problems controlling aggression, but there is no such evidence for the self-treatment of (prior) depression (31).

Lynskey et al. (32) found that an individual’s vulnerability may explain the correlation among tobacco, alcohol, and cannabis abuse. Such vulnerability was predicted by the interaction of the individual with delinquent and substance abusing peers.

The coexistence of cannabis and alcohol abuse is also intriguing (33) and raises the question of whether there is a common liability to the abuse of the two substances or a common psychological basis.

The common liability model assumes that a common factor is responsible in the use of both licit and illicit drugs. Genetic factors and peer pressure may put an individual at risk for using or abusing both legal and illegal substances, including alcohol and cannabis.

Another explanation being considered is the “gateway theory,” whereby a licit substance (tobacco or alcohol) may serve as a gateway to cannabis abuse (34).

Although the abuse of alcohol can be found among all types of people in all walks of life, our study population demonstrated a high representation of patients with blue collar background. These data correspond with published results of the large-scale epidemiological studies that dealt with the general population (35), twins (36), and some minorities (37). The Australian National Survey of High Impact Psychosis (SHIP) revealed an association between alcohol abuse and low educational level among individuals with psychoses (38). In a population of alcohol abusers, individuals reporting a chronic course of major depressive disorder were socioeconomically and educationally disadvantaged (39).

Limitations of the study include the fact that since the beginning of the study, there has been a sharp rise in the abuse of synthetic cannabinoids (40), which were not included in the original toxicology screen. This might well serve to remind us that the significant percentage of substance abusers among the study population is probably an underestimate. In addition, alcohol abuse was based solely on patients’ self-report and psychiatric history. Finally, the study was cross-sectional and the sample was middle-sized. However, as our mental health center has a catchment area of Greater Jerusalem (a population of close to a million people), we believe that the respondents in this study represent the general population. We propose that similar studies be replicated on a larger scale and in different venues to confirm our findings.

CONCLUSIONS

A significant percentage of individuals presenting with psychosis were found to be using psychoactive substances/alcohol. Because of the significant impact of psychoactive substance abuse on the psychopathology, diagnosis, and prognosis, we believe that a routine toxicology screen is recommended in all first hospitalizations and that there be a high level of suspicion for comorbid substance abuse when diagnosing a first psychotic episode.

There may be a preferential use of the type of psychoactive substance and the psychiatric symptomatology manifested.

Moreover, in our study, we found that 34 individuals (37.3%) had been taking cannabis alone or in combination with other illegal psychoactive substances in the month prior to their first episode. This finding would lead us to believe that in many cases, substance abuse predates the psychiatric flare-up.

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