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## Cannabis Consumption as a Prognostic Factor in Schizophrenia

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Data were analysed from 62 schizophrenic patients between 18 and 30 years of age, treated at the community mental health centres in Navarra, who had relapsed and then completed a one-year follow-up study. Factors influencing the course of illness during follow-up were: continuing cannabis consumption; previous cannabis intake; non-compliance with treatment; and stress. *British Journal of Psychiatry* (1994), 164, 679-681

Many authors have described a higher drug consumption by psychiatric patients compared with the overall population. Excluding alcohol and tobacco, cannabis is the drug most frequently used by patients with psychiatric disorders (Shearn & Fitz, 1972). Moreover, a greater consumption of cannabis has been observed in schizophrenic patients compared with other psychiatric patients (Tsuang *et al*, 1982).

In a study of relapse of schizophrenia, Herz & Melville (1980) found that 20% of all schizophrenic patients had abused alcohol or other drugs. Barbee *et al* (1989) found that almost 50% of schizophrenic patients admitted to the emergency department of a general hospital had abused alcohol or other drugs, mainly cannabis. Brady & Gasto (1989) reported a 36% incidence of drug abuse in a study performed with 35 in-patients with acute psychotic symptoms, of whom 25% were schizophrenic.

There is controversy over the aetiological role of cannabis in schizophrenia (Andreasson *et al*, 1989; Negrete, 1989), while there is more agreement on the effect of cannabis on an existing psychosis (as a precipitant of relapse, or aggravating or modifying symptoms) (Knudsen & Vilmar, 1984; Negrete *et al*, 1986; Negrete, 1989; Turner & Tsuang, 1990). Three possible mechanisms are suggested:

- symptom exacerbation by direct effect on mental processes
- development of a toxic psychosis overlapping with schizophrenic symptoms
- neutralisation of antipsychotic medication because of central dopaminergic and anticholinergic effects of cannabis.

This study assesses the importance of cannabis consumption as a short-term prognostic factor in schizophrenia.

### Method

The inclusion criteria were: a diagnosis of schizophrenia and a relapse fulfilling DSM-III criteria (American Psychiatric Association, 1980) in the study period; age at onset over 16 years; and present age between 18 and 30 years. The presence of residual schizophrenia (DSM-III) was an exclusion criterion.

Table 1  
Probability of relapse and cannabis intake of schizophrenic patients

Class	Probability		No. of cases		Probability		No. of cases		Regression parameters	
	THC+ and THC±	THC-	THC+ and THC±	THC-	THC+ and THC±	THC-	THC+ and THC±	THC-	$B_0$	$B_1$
Compliance with treatment + absence of stressing factors	0.232	0.017	12	11	0.550	0.060	3	20	-2.033503	0.8375205
Compliance with treatment + presence of stressing factors	0.411	0.077	6	2	0.616	0.184	3	5	-5.589278	1.5495140
Non-compliance with treatment + absence of stressing factors	0.618	0.281	6	4	0.679	0.444	2	8	-0.074831	0.2739089
Non-compliance with treatment + presence of stressing factors	0.789	0.648	14	7	0.735	0.738	6	15	-4.009634	1.2608980

THC -, non-consumers; THC +, active consumers during follow-up; THC ±, former consumers (abstinent during follow-up).

'Psychotoxic-substances consumers' were defined as subjects who consumed these substances at least twice a week for one year. Axis IV of DSM-III was used to define the acute/chronic stress factors. Treatment compliance was defined as the adequate intake of the prescribed medication as assessed by physicians (all patients were on neuroleptic treatment), as well as by attendance during follow-up at the medical centres.

For evaluating follow-up, patients were categorised into three groups according to cannabis consumption:

- non-consumers of tetrahydrocannabinol (THC -)
- consumers (THC +) both before entering the study and during the year of follow-up (active consumers)
- consumers up to the initiation of the study, who kept abstinent (THC ±) during the follow-up year (former consumers).

Spearman rank correlation was used to verify the independence of the selected variables, for calculation of the probability of relapse using the logistic regression model.

### Results

Of 80 patients fulfilling the entry requirements, only 62 (78%) could be evaluated; of the remainder, 2 committed suicide before completing follow-up, 11 (14%) dropped out from follow-up treatment, and 5 (6%) declined to participate.

There were 40 men (65%) and 22 women (35%), with a mean (s.d.) age of 23.6 (3.4) years. Sixty (97%) were single and 2 (3%) married. Twenty-six (32%) were employed and 36 (68%) were unemployed. At recruitment, 40 (65%) were in-patients and 22 (35%) out-patients. The mean (s.d.) age at onset of schizophrenia was 21.4 (3) years, and the mean age at first admission was 22.3 (3.4) years. The subjects had had an average of 1.9 (range 0-16) episodes of schizophrenia.

Fifty-one (82%) of the patients, were considered to have paranoid schizophrenia, 5 (8%) to have the disorganised type and 6 (10%) the undifferentiated type of schizophrenia. Twenty (32%) had a premorbid schizoid personality

disorder, 6 (10%) an antisocial personality disorder, 2 (3%) had other personality disorders, 10 (16%) presented schizoid signs (not fulfilling the DSM-III diagnosis criteria), and 24 (39%) did not present any personality disorder.

The two groups, THC + plus THC ±, and THC -, did not differ significantly on any of these factors.

Thirty-eight patients (61%) had previously used cannabis, 6 (10%) amphetamines, 4 (6%) hallucinogens, 6 (10%) cocaine, 6 (10%) sedatives, 7 (11%) opiates, 53 (85%) tobacco, and 45 (73%) alcohol.

At the beginning of the study, 30 patients (50%) regularly consumed cannabis, 2 (3%) amphetamines, 1 (2%) hallucinogens, 2 (3%) sedatives, 1 (2%) opiates, 51 (82%) tobacco, and 39 (63%) alcohol. They all denied consuming cocaine or volatile substances.

During the follow-up, 14 (20%) maintained cannabis intake, 1 (2%) opiates, 51 (82%) tobacco, and 27 (43%) alcohol. They did not consume amphetamines, hallucinogens, cocaine, sedatives or volatile substances.

Four (17%) non-consumers of cannabis relapsed during the year of follow-up, as did 9 active consumers (64%) and 9 former consumers (37%) ( $P < 0.05$ ). Admission was required for 4 (17%) non-consumers, 6 (43%) active consumers and 3 (12%) former consumers. Sixteen non-consumers (68%) complied with treatment, as did 5 (36%) active consumers and 18 (75%) former consumers ( $P < 0.05$ ). There were acute stress factors in 2 (8%) non-consumers, 5 (36%) active consumers, and 6 (25%) former consumers. However, chronic stress factors were found in 10 (42%) non-consumers, 9 (64%) active consumers and 10 (42%) former consumers (the severity of the psychosocial stressors were mild and moderate, as defined by Axis IV of DSM-III).

Candidate variables for logistic regression were: chronic stress factors, acute stress factors, treatment compliance, personality disorder, age at onset of disease, number of previous active episodes, maximum adjustment level reached, and sex. Only chronic stress factors, acute stress factors and treatment compliance yielded significant Spearman correlations over the dependent variable (relapse) ( $-0.39223$ ,  $P < 0.016$ ;  $-0.28326$ ,  $P < 0.025$ ;  $-0.57901$ ,

$P < 0.001$ , respectively). However, as acute and chronic stress factors were interdependent ( $0.47000$ ,  $P < 0.01$ ), only chronic stress factors were considered in the logistic regression model (Table 1).

### Discussion

During the year of follow-up, continuing cannabis consumers presented a much higher frequency of relapse, non-compliance with treatment and acute stress factors than non-consumers (THC -); former consumers showed an intermediate position between the first group and non-consumers with respect to relapse and acute stresses.

According to Herz & Melville (1980), alcohol intake, psychoactive substance intake and stress are the features most frequently associated with relapse. In this study, patients who continued taking cannabis during follow-up had the highest incidence of these three factors, as well as the highest incidence of non-compliance with treatment.

Using the logistic regression model, our findings indicate that stress is less predictive of relapse than a history of cannabis consumption or non-compliance with treatment. The most predictive factor of relapse was the continuing consumption of cannabis. However, these patients had a history of psychotoxic substance consumption. In addition, most of them also misused alcohol.

When stress, non-compliance with treatment, history of cannabis consumption and continuing cannabis consumption are combined in pairs, the probability of relapse increases considerably. When past cannabis use, stress and non-compliance with treatment occur together, probability of relapse is highest. In this case, however, continuing use of cannabis has no further influence on outcome.

These results are compatible with those of Negrete *et al* (1986), who observed that active consumption of cannabis was the most influential factor in the development of delirious-hallucinatory features, as well as the factor which produced the most treatment consultations, compared with treatment non-compliance, age, and duration of illness.

These data are also consistent with the studies noted in the introduction, which reported that cannabis consumption is associated with a poorer outcome of schizophrenia. The nature of the association is unclear. Cannabis use might be a result

of the severity of the schizophrenia, so that patients with a poorer outcome would consume more cannabis secondarily. On the other hand, cannabis use could be a factor in relapse.

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