

## Self-Medication Hypothesis: Use of Cannabis by Patients with Schizophrenia in Indian Settings

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### ABSTRACT

**Background:** The correlation between adolescent cannabis use and schizophrenia is indicated by a substantial body of evidence from developed countries of the. Cannabis users have also been found to be three times more likely to develop schizophrenia. Self-medication hypothesis of schizophrenia presumes that patients with schizophrenia are inherently deficient in endogenous cannabinoid functioning; hence, such patients use cannabis to "normalise" their inherent deficits. Hence; to understand this concept we studied the use of cannabis in 50 patients with schizophrenia who were diagnosed using DSM IV- R criteria.

**Materials & Methods:** The present study included assessment of 50 patients who were diagnosed for schizophrenia following the diagnostic criteria of DSM IV- R. All the patients were between the age group of 18 years to 42 years. In 30 patients out of 50, use of cannabis antedated the onset of schizophrenia - the period of use of cannabis ranged from 1 month to 3 months. However, in 20 out of 50 patients, the use of cannabis started after the onset of schizophrenia. All the results were compiled and assessed by SPSS software.

**Results:** A total of 50 patients were included in the present study. 12 patients belonged to the age group of 18 to 25 years, 8 patients belonged to the age group of 26 to 30 years and 14 patients belonged to the age group of 31 to 35 years. Only 6

patients were of 36 to 40 years of age. Non-significant results were obtained while comparing the demographic details of the patients. Almost all of these patients ( 19 out of 20) were still using cannabis when assessed for this study, whereas, in patients, where cannabis use antedated the onset of illness 19 out of 30 patients were using cannabis at the time of assessment.

**Conclusion:** A significant number of patients had used cannabis after the onset of schizophrenia shows acceptance to the self-medication hypothesis.

**Key words:** Cannabis, Self-Medication, Schizophrenia.

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### INTRODUCTION

The correlation between adolescent cannabis use and schizophrenia is indicated by a substantial body of evidence from developed countries of the. Cannabis users have also been found to be three times more likely to develop schizophrenia. Research findings from Nigeria corroborate those from the Western countries that mental disorders are highly prevalent among cannabis users and account for the majority of drug-related admissions in Nigerian psychiatric care facilities.<sup>1,2</sup>

In relation to his association, there are several plausible mechanisms. For example, administration of very high doses of tetrahydrocannabinol to healthy individuals can produce transient psychotic-like symptoms.<sup>3</sup> Thus, it is either that cannabis is a risk factor for the development of schizophrenia or its use in schizophrenia may be to self-medicate the negative symptoms of schizophrenia, since conventional antipsychotics do not treat

negative symptoms. This is because cannabis stimulates dopamine release, the level of which is low in negative symptoms.<sup>4</sup> Consistent with this is the reported higher rates of cannabis use in people with schizophrenia than in the general population. Nevertheless, prospective and retrospective studies indicate that the onset of cannabis use typically precedes that of schizophrenia, somehow revoking the self-medication hypothesis.<sup>5,6</sup>

Self-medication hypothesis of schizophrenia presumes that patients with schizophrenia are inherently deficient in endogenous cannabinoid functioning; hence, such patients use cannabis to "normalise" their inherent deficits.

Hence; to understand this concept we studied the use of cannabis in 50 patients with schizophrenia who were diagnosed using DSM IV- R criteria.

**MATERIALS & METHODS**

The present study was conducted in the department of psychiatry of the Rohtak Psychiatry Centre and included assessment of 50 patients who were diagnosed for schizophrenia following the diagnostic criteria of DSM IV- R. Ethical approval was taken from the institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. All the patients were between the age group of 18 years to 42 years. Assessment of all the patients was done who reported from December 2011 and December, 2013.

**Inclusion criteria**

- Patients between the age group of 18 years to 45 years
- Patients with a history of cannabis use for a month or longer
- Patients with a diagnosis of schizophrenia according to DSM IV- R Criteria
- Patients without history of any known drug allergy

In 30 patients out of 50, use of cannabis antedated the onset of schizophrenia - the period of use of cannabis ranged from 1 month to 3 months. However, in 20 out of 50 patients, the use of cannabis started after the onset of schizophrenia. Almost all of

these patients (19 out of 20) were still using cannabis when assessed for this study, whereas, in patients, where cannabis use antedated the onset of illness 19 out of 30 patients were using cannabis at the time of assessment. All the results were compiled and assessed by SPSS software. Chi-square test and univariate regression curve was used for the assessment of level of significance.

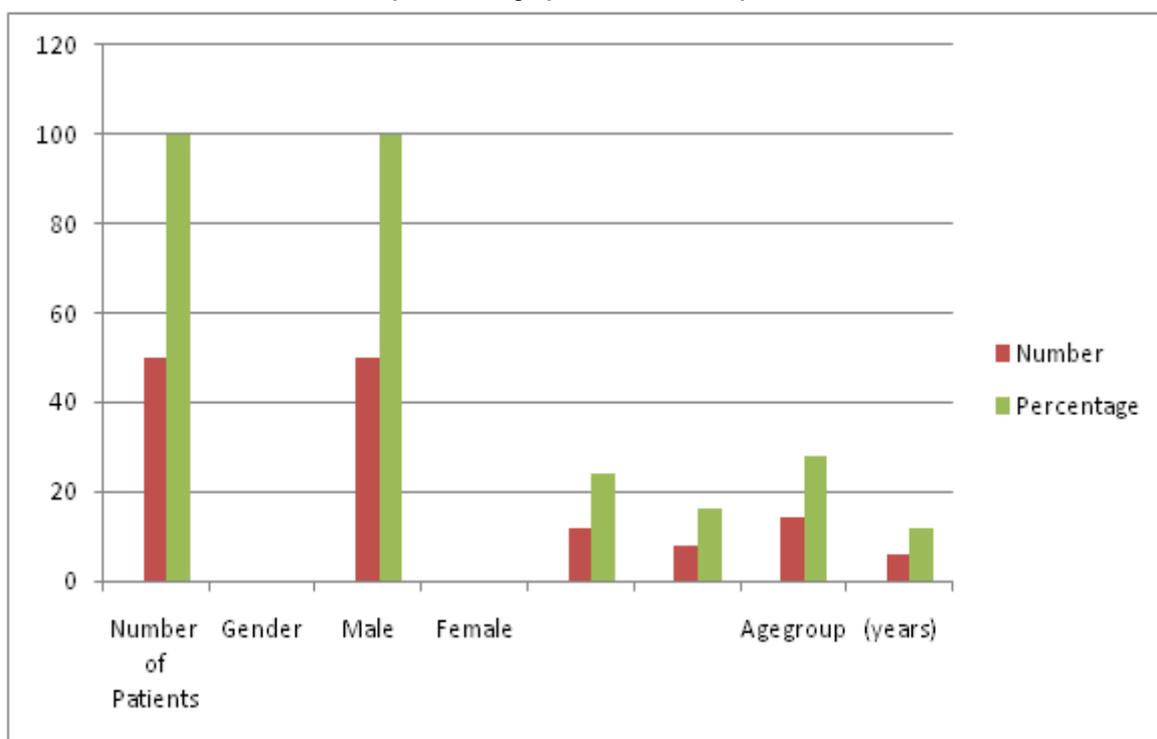
**RESULTS**

A total of 50 patients were included in the present study (Table 1). 12 patients belonged to the age group of 18 to 25 years, 8 patients belonged to the age group of 26 to 30 years and 14 patients belonged to the age group of 31 to 35 years. Only 6 patients were of 36 to 40 years of age. Non-significant results were obtained while comparing the demographic details of the patients (P-value > 0.05). In the group of patients in whom cannabis use postdated the onset of schizophrenia almost all ( 19 out of 20 i.e. 95% ) were still using cannabis, in comparison with 19 out of 30 i.e 63.3% in the group in which cannabis use antedated the onset of schizophrenia ( P-value< .05 ).

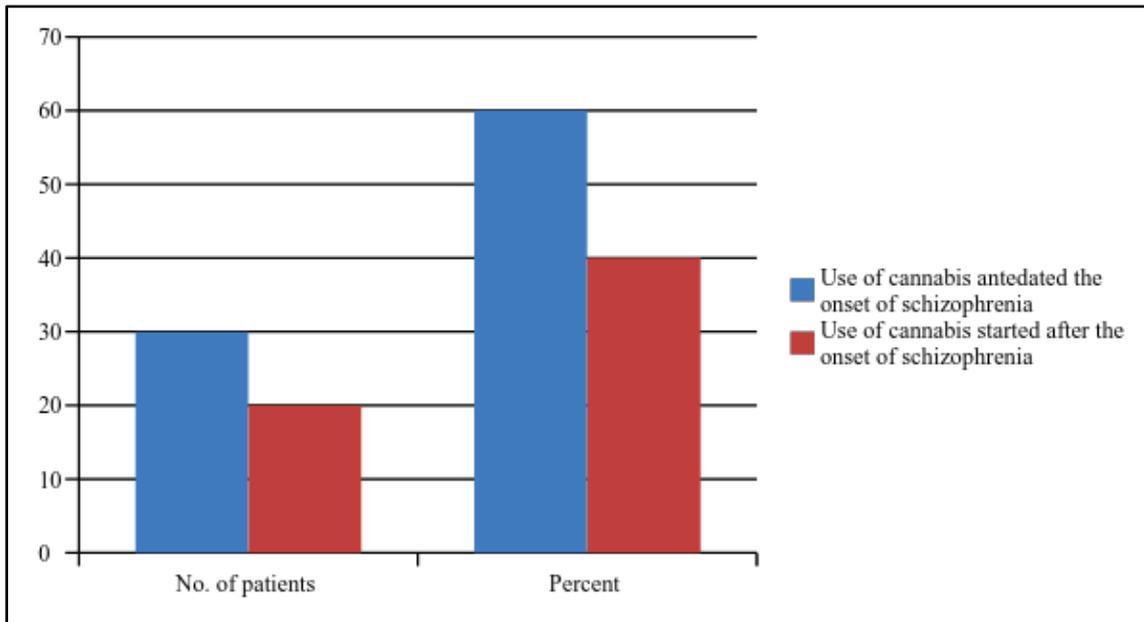
**Table 1: P-value for Demographic details of the patients**

Parameter		Number	Percentage	p- value
No. of patients		50	100	-
Gender	Male	50	100	NA
	Females	00	00	
Age group (years)	18- 25	12	24	0.24
	26- 30	8	16	
	31-35	14	28	
	36- 40	6	12	
	41- 45	10	20	

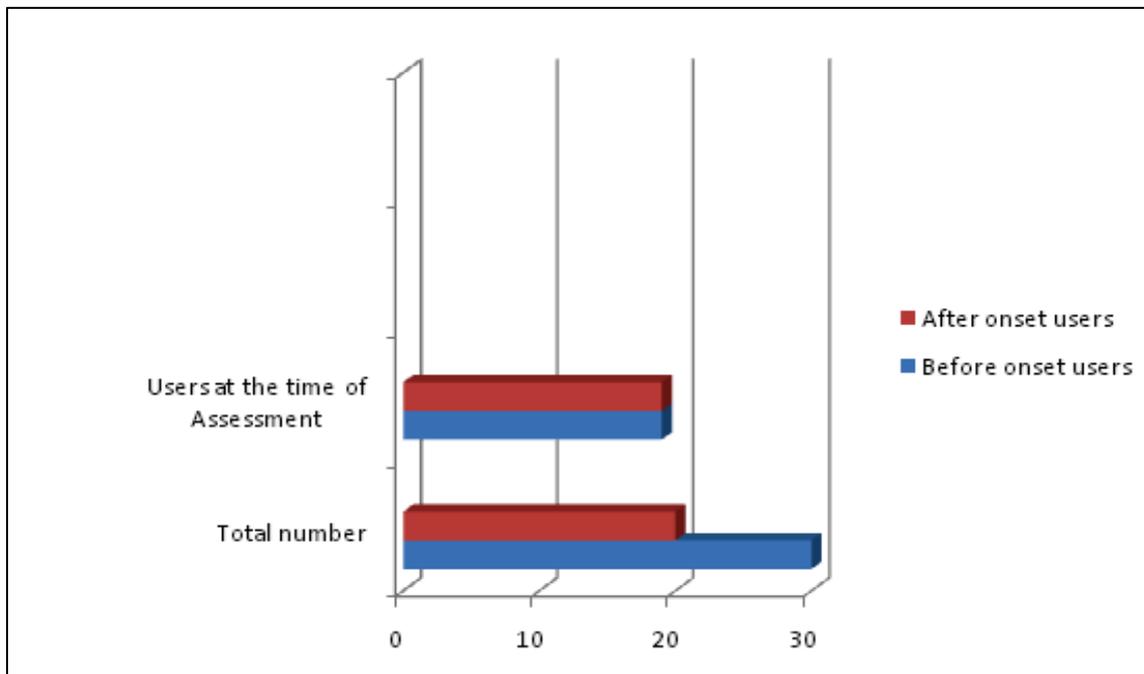
**Graph 1: Demographic details of the patients**



**Graph 2: Effect of cannabis on the onset of schizophrenia**



**Graph3. Cannabis Use at the time of Assessment in, Before and After Onset User Groups of Schizophrenia**



**DISCUSSION**

One of the chronic often disabling developmental brain disease that affects approximately 1 % of the population over the course of life is Schizophrenia, which is characterized by positive symptoms (delusions, hallucinations, and disorganized thinking), negative symptoms (social withdrawal, amotivation, and affective flattening), deficits in cognition (memory, executive functioning, and processing speed), and a decline in social and occupational functioning.<sup>7,8</sup> While significant advances have been made in understanding the neurobiology of schizophrenia, and effective treatments have been developed for positive symptoms, the goal of reversing disability associated with cognitive deficits and amotivation has not been realized.<sup>9</sup>

Cannabis sativa is the most commonly used illicit substance globally, and is widely recognized for its ability to cause acute psychotic symptoms and cognitive impairment similar to

schizophrenia.<sup>10,11</sup> Cannabis is also the most commonly abused illicit substance amongst people with schizophrenia, and there is substantial evidence that continued use after a schizophrenia diagnosis is associated with worsening psychotic symptoms, relapse, and decreased functioning over time.<sup>12</sup> Hence; to understand this concept of self-medication, we studied the use of cannabis in 50 patients with schizophrenia who were diagnosed using DSM IV- R criteria.

In the present study, we observed that significant number of patients (20 out of 50) had used cannabis after the onset of schizophrenia which shows acceptance to the hypothesis that patients with schizophrenia use cannabis to " heal themselves " in contrast to the general observation that in some vulnerable individuals cannabis may induce schizophrenia or psychosis. It is possible that there is a sub group of schizophrenia patients who have a dysfunctional cannabinoid receptor system which is set

right by use of external cannabis use and gives some relief to such patients and hence, they use cannabis after the onset of illness.

Lasebikan V et al determined the prevalence of cannabis use among patients with schizophrenia with associated levels of harm in a Nigerian clinical setting. In this case-control study, consecutive 150 patients with schizophrenia were matched by age and gender with an equal number of patients that utilized the general outpatient department of the State Hospital, Ring Road Ibadan. The alcohol, smoking and substance involvement screening test (ASSIST) was used to obtain prevalence of cannabis use and level of health risk as determined by the ASSIST score. The positive and negative syndrome scale was used to determine the severity of psychosis. Respondents of male gender and those who were not married were significantly more likely to be cannabis users among patients with schizophrenia, respectively. Cannabis use was prevalent among patients with schizophrenia and was associated with health risks. Thus, routine screening for cannabis use and brief intervention is suggested to be integrated into care for adolescents and adults with schizophrenia.<sup>13</sup>

Dervaux A et al compare the socio-demographic correlates and the clinical features in a group of schizophrenic patients with a lifetime cannabis abuse or dependence according to the DSM III-R with a group of schizophrenic patients who had never presented any abuse or dependence. The study included 124 subjects with diagnoses of schizophrenia or schizoaffective disorders according to the DSM III-R. Inclusion criteria for participation in the study were age 18 years or older and willingness to provide consent to participate in the study. The inpatients were evaluated when their condition was stabilised. Assessment tools were the psychoactive substance use disorder section of the Composite International Diagnostic Interview (CIDI), the Positive and Negative Syndrome Scale (PANSS), the Global Assessment of Functioning Scale (GAF). Subjects with cannabis abuse or dependence during their lifetime were compared with subjects without abuse or dependence, using chi<sup>2</sup> test for categorical variables and analyses of covariance (ANCOVA) for quantitative variables. Forty-nine subjects (42.6%) presented lifetime abuse or dependence on one or more substances. Since 19 patients with alcohol, stimulant, sedative or opiate abuse or dependence were excluded, the study finally included 96 subjects including a first group of schizophrenic patients with cannabis abuse (n=6) or dependence (n=24) and a second group without any psychoactive substance abuse (n=66). Thirteen (11.3%) patients presented cannabis abuse or dependence within the 6 months prior to the assessment. The socio-demographic characteristics of cannabis abuse or dependence in schizophrenia are similar to those found in general population. Cannabis using schizophrenic patients were more likely to be younger and male than non-users.<sup>14</sup> In the present study, one interesting finding is the absence of female patients which is understandable given the Indian context and region.

## CONCLUSION

The study concludes that a significant number of patients had used cannabis after the onset of schizophrenia shows acceptance to the self-medication hypothesis. However, future studies are recommended for further exploration of this area of psychiatry and medicine.

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