Psychocentrum Review

The Impact Of Cannabis Abuse On Psychotic Symptoms And Their Severity Among Cannabis Associated Psychosis Subjects: An Indian Experience

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Original Article

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Abstract. Use of cannabis for recreational, religious and cultures has been prevalent since ancient times. It is one of the commonest used illicit substance. While not all cannabis users develop psychiatric problems, heavy cannabis use may increase the risk of cognitive abnormalities, psychotic illness and mood disorders. This research aimed to evaluate severity of various psychotic symptoms in relation to variables of cannabis abuse. A cross sectional study of 30 male patients admitted at tertiary care psychiatric center with diagnosis of cannabis-associated psychosis was carried out. Cannabis abuse variables along with psychotic symptoms severity on BPRS scale were obtained. Correlation between variables of cannabis abuse and psychotic symptoms and total BPRS score were derived using Pearson correlation 2- tailed test. Hostility (83%) and excitement (77%) were most prevalent symptoms with increased severity followed by elevated mood, grandiosity, suspiciousness and motor hyperactivity. Patients with long duration and early onset of cannabis abuse presented with more severe form of psychosis. Frequency of cannabis use was not significantly correlated with total BPRS score, although amount spent over cannabis was significantly associated with total BPRS score. Family history of cannabis abuse predicted early onset of cannabis abuse.

Introduction

Cannabis is most commonly used illicit drug (United Nations Office on Drugs and Crime, 2012; Degenhardt & Hall, 2012). It is widely used in India and is an integral part of Indian culture and religious customs since ancient times (Kuddus et al., 2013). The correlation between cannabis and negative mental health outcomes has been unequivocally established (Feingold et al., 2015; Klempova et al., 2009; Rubino et al., 2012; Swift et al., 2008). While not all cannabis users present with mental health problems (Rubino et al., 2012), epidemiological

studies suggest that heavy cannabis use during adolescence may increase the risk of cognitive abnormalities and psychotic disorders (Feingold et al., 2015; Rey et al., 2004; Swift et al., 2008; Wittonc & Reed, 2010).

Use of cannabis at early age and high frequency are associated with a greater risk of problems (W Hall et al., 2008; Rubino et al., 2012; Swift et al., 2008; von Sydow et al., 2002). Arendt et al (2008) consider that cannabis-associated psychosis is an early expression of schizophrenia in vulnerable individuals rather than part of the differential diagnosis. Moore et al review (2007) reported a 40% higher risk of psychosis in subjects who occasionally used cannabis and a probability of 50% to 200% higher in regular cannabis users. Swedish Conscripts Study (Andréasson et al., 1987) of 45570 inductees into the military reported a risk for schizophrenia 2.4 times higher among those who had used cannabis by 18 years than among non-users. A recent meta-analysis of 10 studies with 66816 participants confirmed the positive association between cannabis abuse and risk of psychosis (Marconi et al., 2016).

This cannabis-induced psychosis is not easily distinguishable from Schizophrenic symptomatology (D'Souza et al., 2004), it has been characterized by more bizarre behavior, violence, panic, more hypomanic symptoms and agitation, and fewer hallucinations and less blunting of affect and incoherent speech (Marconi et al., 2016). Available evidence also indicates significantly higher degree of hallucinatory and delusional experiences among schizophrenic individuals with cannabis abuse in compare to non-users (Pierre et al., 2016).

Cluster of studies have found cannabis associated psychosis a constellation of affective symptoms such as euphoria, increased psychomotor activity (Basu et al., 1999; Pierre et al., 2016) whereas others have found similarity with schizophrenic symptomology of social withdrawal, thought disorder and disorganized behavior (WHO, 1997; Leweke et al., 2004) so there is immense need to define the presenting features of this disorder. Additionally phenomenology of the cannabis use disorder need to be explored to clearly define, identify and manage this population. Despite widespread use of cannabis there is lack of research data from most part of the world including India.

Based on the existing literature we formulated following hypothesis that "Patients with cannabis associated psychosis have different symptom profile than other common psychiatric disorders, relating to variables of cannabis abuse e.g. dose, frequency, duration". *To test the hypothesis following objectives were formulated*: 1) To assess variables of cannabis abuse in patients with cannabis associated psychosis. 2) To find the correlation between variables of cannabis abuse, and psychotic symptoms profile and total BPRS score.

Method

Participants

Patients with temporal association of cannabis abuse with onset of psychotic illness were included in the study. The study included 30 consequentially admitted, Hindi speaking patients of 18-50 years of age at tertiary care psychiatric hospital in north India. Patients with mental retardation, a significant medical condition compromising ability to participate, history of head injury with any documented cognitive sequel, and inability to provide informed consent were excluded from study. Patients having history of psychiatric illness prior to onset of cannabis abuse, predominant abuse/dependence of other psychoactive substance and having any other significant medical illness were also excluded from study.

Sampling procedures

A cross sectional study was carried out. To include in study all the patients admitted during the study period were were screened with a specially designed screening pro forma. That encompassed all the inclusion and exclusion criteria. Those subjects who satisfied the screening process were recruited in the study.

Materials and Apparatus

After recording socio demographic data, each participant in the study was subjected to semi-structured questionnaire regarding his cannabis abuse and brief psychiatric rating scale (BPRS). All obtainable data were used including interviews, collateral interviews with family members and other informants. Data on cannabis abuse were collected by inquiring about three levels of frequency – ever, weekly and daily. Amount of cannabis abused by individual was difficult to quantify because concentration of delta-9 THC varies in various forms of cannabis available in market. To overcome this limitation indirect measure in form of average amount (INR) spent daily was inquired assuming that cost is driven by concentration of active ingredient in abused form of cannabis. The age of onset, duration of abuse, and cause of onset- accidental, casual, peer group and offer by elder family members were recorded. The history of cannabis abuse as well as psychiatric illness in other family members was inquired. Written informed consent was obtained from all the study participants.

Data Analysis

Analysis data about duration of abuse and cannabis abuse variables were analysed with basic descriptive statics. Frequency and severity of various psychiatric symptoms obtained with BPRS were determiened in form of mean and standard deviation. Patients were classified according to frequency of use- daily, weekly and ever and correlations to various psychotic symptoms were generated by using the Pearson correlation two tailed test.

Result

Table: 1 Socio demographic characteristics of participants (n- 30)

Characteristic	Mean	Range	
Age (years)	28.56	18-37	
Education	Upto middle (13)	Middle to senior secondary (11)	Graduate/ post graduate (6)
Sex	Male (30)	Female (0)	
Marital status	Married (9)	Unmarried (14)	Other (7)
Family type	Nuclear (7)	Joint (18)	Other (5)
Locality	Rural (23)	Urban (7)	

Majority of the participants were young male adults of the rural background. About 47 % (n-14) of them were unmarried and 60 % (n-18) were belonged to joint family. All the study participants were formally educated and at least one family member of about 43% (n-13) of participants had history of cannabis abuse.

Table-2: Variables of cannabis abuse in participants (n-30)

Characteristic	Mean	S.D.	Range
Duration of cannabis abuse (years)	14.2	8.00	3-30
Age of onset of cannabis abuse (years)	14.5	11.7	8-25
Amount spent per day (Rs)	28.132	7.56	4-60
Frequency of cannabis abuse/day	3.9	0.30	3-4
Total BPRS score	75.3	6.49	64-84

As evident from table 2 majority of the study participants were abusing cannabis for more than 10 years with mean duration of cannabis abuse 14.2 years. 50 % of the individuals experienced first cannabis intake before age of 13 years with average onset of cannabis use 14.5 years. Majority of the participants (66%) were daily cannabis abusers. More than 2/3 rd of the subjects was spending Rs. 30 per day on average over the cannabis. Onset of cannabis abuse reported due to peer group among majority of subjects (n-21).

Table 3: Frequency of psychotic symptoms measured on BPRS

Characteristic	Mean	Score >5 over BPRS (%)	Score <3 over BPRS (%)
Somatic concern	2.5		17 (57)
Depression	1.2		25 (83)
Anxiety	2.4		27 (90)
Suicidability	1.1		28 (93)
Hostility	5.8	25 (83)	
Elevated mood	4.8	18 (60)	3 (10)
Grandiosity	4.5	18 (60)	6 (20)
Suspiciousness	4.5	19 (63)	8 (24)
Hallucinations	3.1	15 (50)	15 (50)
Unusual thoughts	3.6	16 (53)	11(37)
Self neglect	4.1	15 (50)	7 (23)
Blunted effect	1.8		19 (63)
Emotional withdrawal	1.9		20 (66)
Motor retardation	1.9	3 (10)	25 (83)
Tension	1.2		28 (93)
Excitement	5.2	23 (77)	5 (15)
Distractibility	4.0	17(63)	7 (23)
Motor hyperactivity	4.9	22 (73)	3 (10)
Mannerisms and posturing	3.6	6 (20)	6 (20)

The symptoms that were associated with increased severity in majority of patients were hostility {n=25 (83%)}, excitement {n=23 (77%)}, elevated mood, grandiosity, suspiciousness, distractibility and motor hyperactivity in more than 60% of individuals. Other symptoms that were present in severe to very severe form in more than half individuals were hallucinations, unusual thought content, uncooperativeness, and self neglect. Suicidability and tension was absent in {n=28(93%)} of patients, depression and motor retardation was absent in {n=25(83%)} of participants, guilt was absent in 70% of patients and blunted affect, conceptual disorganization and emotional withdrawal were completely absent in >60% of individual patients.

Duration of cannabis abuse and phenomenology
Long duration of abuse was negatively correlated with depression (-0.5) and hostility (-0.7) but other symptoms like suspiciousness (0.6), hallucinations (0.6), and unusual thought content (0.8) were positively correlated. Duration of cannabis abuse was significantly associated with total BPRS score (p-0.002). Patients with long duration of cannabis were presented with more severe form of psychosis than patients with short duration of cannabis abuse (p=0.003).

Age of onset of cannabis abuse and phenomenology

Older age of onset of cannabis use was significantly associated with depression (p<0.001) and hostility (p-0.001). Younger age of onset was significantly correlated with anxiety (p-0.048), guilt (p-0.002), hallucinations (p-0.001), and unusual thought content (p-0.006). Total BPRS score was significantly correlated with younger age of onset.

Frequency of cannabis abuse and phenomenology

Frequency of cannabis abuse was significantly associated with self-neglect (p-0.007) and tension (p<0.001). Majority of daily cannabis abuser patients (83%) had history of self-neglect in range of severe to very severe form.

Correlation with amount spent over cannabis

The amount spent over cannabis was significantly correlated with anxiety (p-0.030), hallucinations (p-0.001), bizarre behavior (p<0.001), self-neglect (p-0.01), blunted affect (p-0.024), emotional withdrawal (p-0.003), tension (p-0.001) and distractibility (p-0.028). Most of the symptoms significantly correlated with amount spent over cannabis belonged to the perceptual and thought spectrum. Frequency of cannabis use was not significantly correlated with total BPRS score (p-0.104) although amount spent over cannabis was significantly associated with total BPRS score (p-0.048). Individual in which onset occurred due to influence of peer group had more propensity of developing elevated mood (p-0.002), grandiosity (p-0.023), and conceptual disorganization (p-0.039). Family history of cannabis abuse predicted early onset of cannabis use onset compare to group with negative family history. Total BPRS score was positively correlated with significant value in regard to duration of cannabis abuse (p-0.002), amount-spent daily over cannabis abuse. Earlier age of onset of cannabis abuse was associated with more severe psychotic disorder as measured by BPRS scale (p-0.037)

Discussion

This study was aimed at determining clinical symptoms in relation to variables of cannabis abuse. All subjects were male. This could be attributable to low levels of substance use among females in general and cannabis in particular. Age range was wide and may be due to variation in genetic vulnerability to psychosis, dose of cannabis and duration of illness leading to variable age at presentation. Positive symptoms (motor hyperactivity, excitement, hostility, elevated mood, suspiciousness, grandiosity) were found at higher frequency than negative symptoms (blunted effect, emotional withdrawal and motor retardation). Hallucinations were present in only half of the participants. Other symptoms of the psychosis like conceptual disorganization and catatonic symptoms were absent.

Our result was in support of Kulhalli et al, (2007)(2007) findings that patients with cannabis associated psychosis had high positive scores (>5) on respective BPRS items were hostility {n=25 (83%)}, excitement {n=23 (77%)}, and motor hyperactivity, elevated mood, grandiosity, suspiciousness, distractibility in more than 60% of individuals. The least common symptoms were suicidability and tension 2 (6), depression and motor retardation {n=5 (15%)}, guilt was present in 30% of patients and blunted affect, conceptual disorganization and emotional withdrawal were completely absent in >60% of individuals. Most studies have reported that cannabis produces psychosis with prominent positive symptoms (Basu et al., 1999; Vinod Rai Thacore & Shukla, 1976; Tunving, 1985).

Our findings are in keeping with these studies. Scores on BPRS reflected both the total intensity and the profile of psychopathology. Majority of the participants scored severe to very severe on suspiciousness, grandiosity and unusual thought content while few of them scored on somatic concern and guilt feelings. This indicates that the paranoid them is major presentation of psychopathology in cannabis associated psychosis. Other studies have also described subjects

as commonly having paranoid delusions (V R Thacore, 1973). The mix of diagnoses replicates the findings of previous studies (Basu et al., 1999; Rottanburg et al., 1982; V R Thacore, 1973; Carney & Lipsedge, 1984). Thus our findings largely confirm that reports of other authors that cannabis produces a psychosis with predominantly affective features and more of positive symptoms. Feingold et al (2015) explored the relationship between cannabis abuse and risk of affective disorders in longitudinal study. Almost daily to weekly use of cannabis was associated with increased risk of bipolar disorder (Adjusted odds ratio (AOR)= 2.47(1.03-5.92)) which was supported by our study results. Family history of drug disorders is regarded as risk factor for substance use including cannabis, whether it also results in increased vulnerability to cannabis psychosis is not clear. Early age of cannabis abuse onset was significantly associated with severity of psychotic symptoms.

Our study results were similar to the recent study, which demonstrated positive association between age of cannabis abuse onset and severity of psychopathology (Galvez-Buccollini et al., 2012). Presence of hallucination is only 48 % of studied subjects was contrary to available evidence (Wayne Hall & Degenhardt, 2009).

Limitations of the study:
As this was a cross sectional study and cannabis variables were obtained from interview possibility of "recall bias" can`t be ruled out. It was not possible to measure the amount of cannabis in unit time. Proxy used to represent this variable may not be representative of active ingredient of delta- 9THC.  We have to rely on the subjects `self- report` of not using any other substances and were unable to objectively verify this report. Thus, the possibility that some symptoms were related to abstinence from other drugs cannot be completely excluded. Wide age range could be a drawback of study since homogeneity in duration of illness and amount of cannabis abuse could not be ensured.

Conclusion

The implication of this study is that cannabis contributes in causing and modifying psychosis. Several noteworthy findings emerged from this heterogeneous sample of cannabis-associated psychosis. First the severity of psychotic episode was significantly associated with younger age of onset of cannabis abuse and increased spending was associated with more severe psychotic episode. Second family history of psychosis was not associated with increased severity of cannabis abuse, although family history of psychosis predicted more severe excitement, elevated mood and grandiosity and early onset of cannabis abuse.

Acknowledgements

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