Section: Psychiatry

Original Research Article

PREVALENCE OF NICOTINE DEPENDENCE IN SCHIZOPHRENIA AND ITS CLINICAL CORRELATES

M. B. Abdul Rahuman[1], Victoria A[2], Anantha Krishna Kumar[3], G Ramanujam[4], Karthikeyan[5]

[1]Associate Professor, Department of Psychiatry, Government Thoothukudi Medical College, Tamilnadu, India.
[2]Ex-Post Graduate, Department of Psychiatry, Tirunelveli Medical College and Hospital, Tamilnadu India.
[3]Professor, Department of Psychiatry, Government Theni Medical College, Tamilnadu, India.
[4]Associate Professor, Department of Psychiatry, Tirunelveli Medical College and Hospital, Tamilnadu India.
[5]Ex-Associate Professor, Department of Psychiatry, Tirunelveli Medical College and Hospital, Tamilnadu India.

Received : 31/12/2022
Received in revised form : 09/02/2023
Accepted : 24/02/2023

Keywords:
Smoking, Schizophrenia, Tobacco, Nicotine, Mortality.

Corresponding Author:
Dr. M. B. Abdul Rahuman
Email: drabdul95@gmail.com

DOI: 10.47009/jamp.2023.5.2.99

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (2); 472-476

Abstract

Background: Smoking is a prevalent habit among patients with schizophrenia and is also a risk factor that can be modified to reduce medical mortality. **Aim:** The study aims to examine the occurrence and degree of Nicotine dependency among patients with Schizophrenia. **Materials and Methods:** A cross-sectional case-control study was conducted at the Department of Psychiatry, Tirunelveli Medical College Hospital, for June 2011 to June 2012. Informed consent was obtained from all 60 patients. They were divided into two groups cases (30) schizophrenic patients with a history of smoking and using smokeless tobacco and controls (30) schizophrenic patients without a smoking history. **Result:** The mean ages of the study and control groups were 34.9±6.8 and 35.4±6.5 years, with no significant difference between groups (p=0.289). There is a significant difference in the duration of untreated psychosis between groups (p=<0.05). The nicotine dependence among the two types of tobacco use was compared with a significance of p=<0.001. In addition, the Positive Score for the abnormal involuntary movement was significantly associated with Nicotine dependent group (P=<0.05). The results revealed that nicotine dependence was significantly and positively correlated with their positive symptoms. The 17.2% of positive symptoms depended upon nicotine dependence. **Conclusion:** Smokers also have higher antipsychotic medication dosage and an increased likelihood of abnormal involuntary movements. The findings show that stopping smoking is crucial in helping persons with schizophrenia live longer.

INTRODUCTION

The harms associated with smoking tobacco are well-known, including short-term symptoms such as shortness of breath and long-term risks such as cancer, heart disease and emphysema.[1] People who smoke cigarettes have a higher risk of developing oral, nose, and throat cancer due to inhaling the smoke compared to non-smokers.[2] The prevalence of smoking among individuals diagnosed with severe mental illnesses, particularly schizophrenia, is notably higher than in the general adult population (70% compared to 30%). This tendency to smoke among those with schizophrenia may be an attempt to mitigate cognitive deficiencies.[3] The causes for this high smoking rate in this population are likely to be a complex interplay of various neurological, psychological, behavioural, and environmental factors.

Smoking is a prevalent habit among patients with schizophrenia and is also a risk factor that can be modified to reduce medical mortality.[4] Research indicates that up to 81% of people with schizophrenia smoke cigarettes, compared to 28% of the general population. Additionally, individuals with schizophrenia tend to smoke more heavily. For example, the CATIE study found that 68% of people with schizophrenia depend on nicotine.

Persons with schizophrenia have a greater cardiovascular disease-related morbidity and death rate than the general population. Along with obesity, hypertension, smoking, diabetes, and inactivity, dyslipidaemia is a well-documented contributor to the development of cardiovascular disease. Most people with schizophrenia also have many risk factors, placing them in the "high risk" category for cardiovascular disease.[5] Cardiovascular problems, especially coronary heart disease, seem to be the

ISSN (O): 2687-5365; ISSN (P): 2753-6556

primary cause of the increased mortality in people with schizophrenia. Both males and females with a diagnosis of schizophrenia have a higher 10-year risk of getting cardiovascular disease (9.4 and 7.0%) than the general population (6.3% vs 4.2%).[6] Recent research has found that the risk of dying from cardiovascular disease is almost three times higher in those with schizophrenia compared to the general population.

Patients with schizophrenia who have been using antipsychotics for an extended period are at a very high risk of developing cardiovascular and respiratory disorders, on top of the already high risk associated with smoking and the increased likelihood of developing metabolic syndrome. There has been a shortage of research regarding the medical complications experienced by Indian patients of schizophrenia, despite extensive research into the topic in the West. Smoking may act as a gateway to a wide variety of substance misuse, given that it is the most regularly used, cheap, easily available, and less stigmatising substance of abuse. It is estimated that 13% of all fatalities in India will be attributable to tobacco use by 2020.[7]

Aim

To study the prevalence and severity of Nicotine dependence in Schizophrenic patients and the clinical correlates related to the severity of dependence like Positive and Negative symptoms, antipsychotics induced abnormal involuntary movements and to compare it among nicotine-dependant and non-dependant patients.

MATERIALS AND METHODS

A cross-sectional case-control study was conducted at the Department of Psychiatry, Tirunelveli Medical College Hospital, for June 2011 to June 2012. Informed consent was obtained from all 60 patients. They were divided into two groups cases (30) schizophrenic patients with a history of smoking and using smokeless tobacco and controls (30) schizophrenic patients without a smoking history.

Inclusion Criteria: Patients who fulfilled the ICD Research Diagnostic Criteria for schizophrenia with a history of smoking or smokeless tobacco use, male patients in the age group 15-50 years, and patients who consented to the study.

Exclusion Criteria: Past and current H/O of another Axis I disorder co-morbid substance use, mentally disabled, and demented patients.

Semi-structured proforma to collect sociodemographic data, family history, disease type, age at onset of smoking, age at onset of illness, H/O recent treatment of medication-induced movement disorders and its details, H/O abstinence, reasons for smoking, duration of illness, age at the start of treatment for the illness. Nicotine dependence was measured by Fagerstrom Test for Nicotine Dependence (FTND) and the Fagerstrom Test for Nicotine Dependence-Smokeless Tobacco (FTND-ST). The symptoms were measured by a scale for assessment of positive symptoms (SAPS) and a scale for assessment of negative symptoms (SANS). Abnormal involuntary movements were assessed using Barnes Akathisia Scale (BAS), Modified Simpson Angus Scale (MSAS), and Abnormal Involuntary Movement Scale (AIMS)

The study group (Nicotine dependent) and control group were matched in respect of their demographic, socio and economic status to identify the confounding of SED (Socio-Economic and Demographic) variables. In addition, the relationship between Nicotine dependence with smokers for SAPS and SANS was studied by Spearmans' rank correlation test among the Nicotine dependence subjects.

RESULTS

Table 1: Demographic data of the study

		Study group	Control group	P-value
Age group	20-24	1 (3.3%)	1 (3.3%)	0.289
	25-29	7 (23.3%)	7 (23.3%)	
	30-34	6 (20%)	5 (16.6%)	
	35-39	7 (23.3%)	7 (23.3%)	
	40-44	6 (20%)	8 (26.7%)	
	45-49	3 (10%)	2 (6.6%)	
Duration of illness (Years)	0-10	6 (20%)	10 (33.3%)	0.671
	11-20	15 (50%)	18 (60%)	
	21-30	9 (30%)	2 (7.3%)	
Tobacco	Smoking	26 (86.6%)	4 (13.3%)	<0.001
	Smokeless	14 (46.6%)	16 (53.3%)	
AIMS	Positive	7 (23.3%)	1 (3.3%)	<0.05
	Negative	23 (76.6%)	29 (96.6%)	

The mean ages of the study group and control group were 34.9±6.8 and 35.4±6.5 years, and no significant difference in age between groups (p=0.289). In addition, the mean duration of illness among the nicotine-dependent study group was 13.5±7.9, and the mean among the non-nicotine dependant control group was 12.3±5.8, with no significant difference (p=0.671).

ISSN (O): 2687-5365; ISSN (P): 2753-6556

The nicotine dependence among the two types of tobacco use was compared with a significance of p=<0.001. In addition, the Positive Score for abnormal involuntary movement was significantly associated with Nicotine dependent group (P=<0.05) [Table 1].

Table 2: Demographic data of the study

		Study group	Control group
Occupation	Employed	7 (23.3%)	9 (30%)
	Unemployed	23 (76.6%)	21 (70%)
Social class	Low	28 (93.3%)	28 (93.3%)
	Middle	2 (7.3%)	2 (7.3%)
Family history	Yes	12 (40%)	10 (33.3%)
	No	18 (60%)	20 (66.6%)
Type of Family	Nuclear	15 (50%)	15 (50%)
	Joint	15 (50%)	15 (50%)
Marital status	Married	11 (36.6%)	15 (50%)
	Unmarried	13 (43.3%)	9 (30%)
	Single	4 (13.3%)	4 (13.3%)
	Divorced	2 (7.3%)	2 (7.3%)
Duration of illness (Months)	≤5	0	3 (10%)
	6-11	3 (10%)	9 (30%)
	12-17	7 (23.3%)	4 (13.3%)
	18-24	9 (30%)	14 (46.6%)
	≥ 25	11 (36.6%)	0
Duration of Untreated Psychosis (Years)	<1	3 (10%)	12 (40%)
	1-2	16 (53%)	18 (60%)
	>2	11 (36.6%)	0
MSAS score	<3	5 (16.6%)	11 (36.6%)
	>3	25 (83.3%)	19 (63.3%)
BAS score	No akathisia	23 (76.6%)	19 (63.3%)
	Questionable	5 (16.6%)	6 (20%)
	Mild	2 (6.6%)	5 (16.6%)

The study (Nicotine dependent) and control (non-nicotine dependent) groups were matched in respect of their age, education, occupation, social class, family history, type of family and marital status. The results revealed that they were not significantly different and were comparable. The two groups were matched in respect of their occupation (P=>0.05), social class (P=1.00), family history (P=>0.05), family type (P=1.00), the marital status (P=>0.05). Among the nicotine dependant group, about 67% of the patients presented after 18 months of the onset of their illness. Whereas in the control group, only 47% presented after 18 months of the onset of the illness. There is a significant difference in the duration of untreated psychosis between groups (p=<0.05).
In the study group, 25 patients (83.3%) were >3 MSAS scores, and 5 patients (16.6%) were <3 MSAS scores. In the control group, 19 patients (63.3%) were >3 MSAS scores, and 11 patients (36.6%) were <3 MSAS scores. 66.6 % of the nicotine dependant group of the smoking type had high to very high dependence on nicotine. Whereas in smokeless tobacco users, about 63% had a very low dependence on nicotine [Table 2].

Table 3: Demographic data of the study

	Study group	Control group
Duration of untreated Psychosis (Months)	20.9 ± 8.5	15.1 ± 8.3
SAPS	11.3 ± 4.6	5.5 ± 2.7
SANS	13.1 ± 4.6	9.8 ± 3.8
CPZ equivalents	783.3 ± 343.5	428.3 ± 226.9

The mean durations of untreated psychosis in the study and control groups were 20.9±8.5 and 15.1±8.3. The difference between the means was statistically significant (P=<0.01). The mean SAPS were 11.3±4.6 and 5.5± 2.7. The difference between means was statistically highly significant (P=<0.001). Similarly, the means of SANS between the two groups were 13.1± 4.6 and 9.8±3.8. The difference was also statistically significant (P=<0.01). The means CPZ equivalents of the study and control groups were 783.3±343.5 and 428.3±226.9. The difference between the two groups was statistically significant (P=<0.001) [Table 3].

Table 4: Correlation between Nicotine dependence with SAPS and SANS

Variable	Rank Correlation "r."	Significance	r2	% of r^2
Positive symptoms	0.415	P<0.01	0.172	17.2
Negative symptoms	0.013	P>0.05	0.000169	0.0169

The results revealed that nicotine dependence was significantly and positively correlated with their positive symptoms. The 17.2% of positive symptoms depended upon nicotine dependence. However, nicotine dependence was not significantly correlated with their negative symptoms (P>0.05) [Table 4].

ISSN (O): 2687-5365; ISSN (P): 2753-6556

DISCUSSION

About 54% of the people in our study group were dependent on the smokes and beedis they regularly used. All types of chewing/smokeless tobacco had a rate of 13%. Patients with a mild dependency on tobacco often chewed and then discarded their used tobacco. This is more in line with the results of a study conducted on the psychiatric population by Chandra PS et al.[8] which found that smoking Beedis increased the risk of mental illness by 56% compared to smoking cigarettes (28%). Most tobacco users (67%) reported chewing tobacco, while 46% used cigarettes or beedis (with chewing).

To put it in perspective, we found that just 13% of the people in our study population used pure chewing tobacco, whereas 33% used both smoked and chewed tobacco. Comparing the prevalence of chewing tobacco use as a drug of dependency to that found by other Indian studies on a diverse population that includes patients from both the north and the south of the country leads us to conclude that the problem is considerably less widespread than previously thought. Srinivasan et al.[9] found that in 2002, 31.6% of male schizophrenia patients smoked cigarettes or beedis (with chewing), which is quite close to our results of 33.0%. Sixty-six percent of those who use any tobacco are addicted to nicotine. According to research by Subramanian et al.[10] this is double the frequency found in the general population. According to Fagerström et al.[3] the prevalence of nicotine usage among schizophrenia patients varies widely, from 58% to 90%.

In addition, 83% of patients reported having started smoking before being diagnosed with schizophrenia. Research by Kelly et al.[11] found that 90% of patients started smoking before their sickness began. Thus, this is slightly lower. In our sample of nicotine-dependent individuals, the average number of years spent smoking before the beginning of schizophrenia was 7.5, with a standard deviation of 5.86. This looks to be quite similar to the findings of research conducted on the Chinese population by Zhang XY et al.[12]

The average age of schizophrenia onset was 22.1 ± 4.9 years for those who were nicotine dependent, compared to 20.4 ± 2.7 years for those who were not dependent on nicotine. This disparity might be explained by the self-medication theory, which proposes that persons with schizophrenia may smoke to reduce, at least temporarily, some of the distressing psychotic symptoms they experience. However, as most people with schizophrenia begin smoking before their symptoms emerge, susceptibility to the disorder may also be connected with a greater propensity to begin smoking (de Leon et al.[13] and de Leon et al.[14]) Possible rectification of the cortical-subcortical dissociation of dopamine activity, which may be related with schizophrenia, may account for the improvement of positive symptoms by continuous nicotine treatment (Dalack et al.[15] But in some cases of schizophrenia (possibly the most severe), even larger doses of nicotine might not be beneficial as "self-medication."

Nicotine-dependent Schizophrenia had a higher SANS than non-nicotine-dependent Schizophrenia ($13.1 \pm 4.6 > 9.8 \pm 3.8$). These results are consistent with previous studies suggesting that smokers have more severe symptoms, as measured by higher mean scores on the Brief Psychiatric Rating Scale (Overall JE et al.[16] for both positive and negative symptoms (Goff et al.17, Chong et al.[18] and Ziedonis et al.[19] Smokers' positive ($r=0.415$) and negative ($r=0.456$) sensations were strongly connected with their addiction to nicotine. ($P=<0.01$). Moreover, our study is quite similar to that of Patkar et al.[20] who found positive associations between Fagerstrom scores and overall negative symptom scores and scores on negative symptom subscales of dulled emotion, social disengagement, and difficulties in abstract and stereotyped thinking.

CONCLUSION

Our study finds a correlation between the severity of dependence on smoking and the disease state of schizophrenia, with smokers also having higher antipsychotic medication dosage and increased likelihood of abnormal involuntary movements, highlighting the importance of addressing smoking in treating individuals with schizophrenia. Our results show that the degree of dependency correlates with the condition's severity. Furthermore, the data demonstrate that smokers are prescribed much greater antipsychotic drug dosages than non-smokers. Some people are more vulnerable to the onset of abnormal involuntary movements due to their smoking habits. The findings show that stopping smoking is crucial in helping persons with schizophrenia live longer.

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ISSN (O): 2687-5365; ISSN (P): 2753-6556

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ISSN (O): 2687-5365; ISSN (P): 2753-6556