

Nicotine Dependence among a Group of Iraqi Schizophrenic Patients

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ABSTRACT:

BACKGROUND:

Substance dependence frequently co-occurs with psychiatric morbidities. Among substances, nicotine found to be the commonest substance of abuse among schizophrenic patients.

OBJECTIVE:

To assess the association of nicotine dependence with Schizophrenia.

METHOD:

112 schizophrenic patients and 374 non-schizophrenic patients were invited to answer a standard clinical/demographic questionnaire and a questionnaire on nicotine dependence (modified Fagerstrom Tolerance Questionnaire (mFTQ)).

RESULTS:

The rate of nicotine dependence was significantly higher among schizophrenic patients (44.64%) than non-schizophrenic patients (23.52%) ($P < 0.000$). Male smokers outnumbered female smoker ($P < 0.000$) in both groups. Male gender was a significant predictor for smoking among both groups of patients (OR = 55.878; $P = 0.000$ for schizophrenic patients; OR = 9.489; $P = 0.000$ for non-schizophrenic patients). Increase in age was significant predictor for nicotine smoking in general (OR = 1.032; $P = 0.001$), and among the schizophrenic group (OR = 1.116; $P = 0.000$), whereas, it was not a significant predictor for nicotine smoking among non-schizophrenic patients (OR = 1.014; $P = 0.185$). Whole sample patients start nicotine smoking before their psychiatric disorders onset (3.3 and 7.7 years earlier respectively) ($P = 0.01$). Both groups were highly nicotine dependents (mean mFTQ = 9.92 for schizophrenic patients; mean mFTQ = 8.54 for non-schizophrenic patients) ($P = 0.02$).

CONCLUSION:

The rate and severity of nicotine dependence were higher among patients with schizophrenia than non-schizophrenic patients. Gender and age were significant predictors for nicotine smoking in whole psychiatric patients. Both groups started their smoking habit before their psychiatric morbidity onsets.

KEY WORDS: schizophrenia, nicotine, dependence.

INTRODUCTION:

Individuals with schizophrenia are at increased risk for co-morbid substance use disorders compared with general population^(1,2,3). Lifetime prevalence of any substance abuse in schizophrenia or schizoaffective disorder has been estimated to be around 40-60%⁽⁴⁾. Regier et al⁽¹⁾ estimated that every schizophrenic patient, at some time, also suffers from substance use disorders. Moreover, nicotine smoking was found to be the commonest co-morbidity among schizophrenic patients, occurring in 50 to 90% of the patients⁽⁵⁾. one study has reported nicotine smoking rate among schizophrenic patients of nearly three times rate of general population and even higher than the

Reasons behind recorded high rates of nicotine smoking among schizophrenic patients are not clear yet⁽⁷⁾. However, more than one explanation has been postulated by the researchers. One possible explanation is that schizophrenic patients try to self-medicate with nicotine to overcome negative and positive symptoms as well⁽⁸⁾. This effect of nicotine might be mediated through its regulation of dopamine neurotransmission in the mesolimbic system⁽⁹⁾. Second possible explanation is that smoking might be an environmental contributing risk factor for schizophrenia, through its potential for dopamine release⁽¹⁰⁾. This explanation might be more plausible when some researchers found that

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increased rates of smoking among other psychiatric patients⁽⁶⁾.

schizophrenic patients were smokers even before their illnesses had started^(11,12). Another possible

explanation is the common biopsychosocial contribution between schizophrenia and nicotine smoking, i.e. the factors that predispose an individual to develop schizophrenia may be the same factors responsible for nicotine dependence^(13,14).

On the balance of such a significant co-morbidity, and because of the relative infrequent investigation of nicotine smoking among schizophrenic patients in Middle East, particularly in Iraq, we tried to investigate the rate of nicotine dependence among a group of Iraqi schizophrenic patients, and compare it with another, non-schizophrenic, psychiatric patients.

PATIENTS AND METHODS:

Participants:

Present study is a cross-sectional study of 112 schizophrenic patients who attended the out-patient and in-patient psychiatric units in Hawler teaching hospital, the largest teaching hospital in Erbil city, Northern Iraq, in the period between May to Nov. 2009. These patients were assessed for nicotine dependence and compared with 374 patients of other psychiatric disorders other than schizophrenia who attended the mentioned units during the same period. None of the approached patients declined participation in the study. Inclusion criteria comprised age from 15-85 years, and fulfilling the Diagnostic and Statistical Manual, fourth edition, text revised criteria (DSM-IV-TR)⁽¹⁵⁾ for schizophrenia and other psychiatric disorders, as well.

Assessment:

All patients, from both groups, were informed about the nature and the purpose of the study, and informed consents were obtained from them for their participation in the study. Then after a set of demographic data were collected from each participant, including age, gender, occupation, education, onset of the psychiatric disorder, and onset of their nicotine smoking as well.

For the purpose of assessment of nicotine dependence, Nicotine Dependence Questionnaire (modified Fagerstrom Tolerance Questionnaire) (mFTQ) was adopted by the authors.

mFTQ is a standardized questionnaire with established reliability and validity. It's composed of 8 questions with maximum scores of 15; respondent will be identified as highly nicotine dependent if he/she collects 7 or more scores. However, if the respondent collects only 6 or less scores, he/she will be identified as low to moderate nicotine dependent.^(16,17)

Whenever patients faced difficulties in filling the questionnaire, due to their illiteracy, or profound

formal thought disorders, the authors involved one of the first degree relatives of the patients for more accurate responses to the questionnaire.

Statistical Analyses:

Differences in proportions were measured by adopting chi-square test. Normally distributed data were presented with means and standard deviations, and significance was tested by Student t-test.

Odd ratios were measured, with 95% confidence interval (CI), by adopting Binary Logistic Regression Analysis. Tests were two-tailed. 0.05% was considered as a level of significance.

RESULTS:

The present study compared the rate of nicotine dependence between 112 schizophrenic patients and 374 non-schizophrenic patients.

For the 112 schizophrenic patients, 83 (74.1%) were male and 29 (25.9%) were female; their ages ranged from 17 to 58 year old, with mean age of 32.4 and standard deviation of 10.27 (table-1).

For the 374 non-schizophrenic patients, 179 (47.86%) were male and 195 (52.14%) were female; their ages ranged from 15 to 82 year old, with mean age of 33.36 and standard deviation of 12.49 (table 1).

Among the 374 non-schizophrenic patients, 181 were diagnosed as mood disorders, 22 were diagnosed as other psychotic disorders other than schizophrenia, 84 as one or more of anxiety disorders, 45 as one or more of the somatoform disorders, 19 as alcohol and other substance dependences, 4 as sleep disorders, 7 as dementia, 5 as communication disorders, 2 as pervasive developmental disorders, 3 as erectile disorder, 1 as gender identity disorder, and 1 as bulimia nervosa.

44.64% of schizophrenic patients were nicotine dependents, compared with 23.52% nicotine dependents of the non-schizophrenic patients. The difference was statistically significant ($P < 0.000$) (table-1).

Male dependents outnumber female dependents in both groups. 59.03% of male schizophrenic patients were nicotine dependents, compared to 3.45% of female schizophrenic patients. The difference was statistically significant ($P < 0.000$) (table-1). Among non-schizophrenic patients, 41.34% of male patients were nicotine dependents, compared to 7.18% of female patients. Such a difference was also statistically significant ($P < 0.000$) (table-1).

Both schizophrenic and non-schizophrenic patients were highly nicotine dependents according to mFTQ. Mean nicotine dependence for schizophrenic patients

was 9.92, while mean of nicotine dependence for non-schizophrenic patients was 8.54. However, the difference between both means was statistically

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significant ($P = 0.02$), which amounts to more heavily nicotine dependence by schizophrenic patients (table-1).

Both groups started their nicotine smoking before their mental disorders onset. However, the mean duration between the starting age of nicotine smoking and schizophrenia onset was 3.3 years, much shorter than that of the non-schizophrenic patients, which was 7.7 years. Such a difference was statistically significant ($P = 0.01$) (table-1).

A logistic regression was used to predict nicotine dependence from Gender, Age, and whether the patient was schizophrenic or non-schizophrenic.

Gender, age, and being diagnosed as schizophrenia, all were significant predictors of nicotine dependence. Male gender increased the risk of nicotine dependence by 12.33 times ($P = 0.000$), while for every one year increase in age, risk of nicotine dependence increased by a factor of 1.03 ($P = 0.001$). Moreover, been diagnosed as

schizophrenia, increases the risk of nicotine dependence by 1.8 fold ($P = 0.021$) (table-2).

Also, among the schizophrenic patients, logistic regression was used to predict nicotine dependence from gender as well as the age of the schizophrenic patients.

Gender and age were significant predictors of nicotine dependence among schizophrenic patients. Male gender increase the risk of nicotine dependence by 55.878 times ($P = 0.000$), while for every one year increase in age, risk of nicotine dependence increased by a factor of 1.116 ($P = 0.000$) (table-3).

Finally, for the non-schizophrenic patients, a logistic regression was used to predict nicotine dependence from gender as well as the age of the non-schizophrenic patients.

Male gender was a significant predictor of nicotine dependence among non-schizophrenic patients. Male gender increases the risk of nicotine dependence by 9.489 times ($P = 0.000$). However, unlike schizophrenic patients, increase in age, doesn't associate with significant increase in nicotine dependence ($P = 0.185$) (table-4).

Table 1 :Demographic correlates with nicotine dependence between schizophrenic and non-schizophrenic patients

	Schizophrenia	Non-Schizophrenia
No. (%)	112 (23.05)	374 (76.95)
Age (M \pm SD)*	32.4 \pm 10.27	33.36 \pm 12.49
Nicotine Dependents No. (%)	50 (44.64)	88 (23.52)
	$X^2 = 17.87$ df = 1 P < 0.000	
Male Nicotine Dependents No. (%)	49 (59.03)	74 (41.34)
Female Nicotine Dependents No. (%)	1 (3.45)	14 (7.18)
	$X^2 = 25.5$ df = 1 P < 0.000	$X^2 = 58.65$ df = 1 P < 0.000
Nicotine Dependence / (mFTQ) (M \pm SD)*	9.92 \pm 3.6	8.54 \pm 3.21
	t-student = -2.3 P = 0.02	
Difference, in years, Between the Onset of Starting Smoking, and the Onset of the Disorder (M \pm SD)*	3.3 \pm 8.85	7.7 \pm 10.01
	t-student = 2.58 P = 0.01	

*(Mean \pm Standard Deviation)

Table 2 : Logistic regression analysis of demographic variables associated with nicotine dependence among Schizophrenic and Non-schizophrenic mentally ill patients

	Odd Ratio	CI (95 %)	P value
Diagnosis	1.802	1.095 – 2.966	0.021
Gender	12.331	6.8 – 22.36	0.000
Age	1.032	1.012 – 1.051	0.001

Table 3 :Logistic regression analysis of demographic variables associated with nicotine dependence among Schizophrenic patients

Demographic Variable	Odd Ratio	CI (95 %)	P value
Gender	55.878	6.655 – 469.197	0.000
Age	1.116	1.056 – 1.18	0.000

Table 4 :Logistic regression analysis of demographic variables associated with nicotine dependence among Non-schizophrenic mentally ill patients

Demographic Variable	Odd Ratio	CI (95 %)	P value
Gender	9.489	5.08 – 17.723	0.000
Age	1.014	0.993 – 1.036	0.185

DISCUSSION:

In our sample, schizophrenic patients were significantly more nicotine dependent than non-schizophrenic patients ($P < 0.000$) (table 1). Our study revealed that being diagnosed as schizophrenic, increases the risk of nicotine dependence by odds of 1.8 ($P = 0.021$) (table 2). Such a finding was similar to other findings elsewhere ^(5,6,8,18). However, in the present study, 44.64% of schizophrenic patients were nicotine dependent, a rate which is lower than that of other studies, in which the rate of nicotine smoking among schizophrenic patients ranged 50-90% ^(5,6,8,12,18-26). Such a lower rate might be contributed to different cultural backgrounds and attitudes toward nicotine smoking, particularly in regard of female population, were cigarette smoking among female is more stigmatized in Middle East traditions ⁽²⁷⁻²⁹⁾. Moreover, Mori et al ⁽³⁰⁾ found that the prevalence of cigarette smoking among a group of 137 Japanese schizophrenic patients to be (34%), which was lower than that of general Japanese population (37%). Earlier in this paper, we considered three possible explanations of the association between high rates of nicotine smoking and schizophrenia. However, in our patients, nicotine smoking cannot be considered as the symptoms of the illness itself, or due to the effects of institutionalization, because the mean age of starting smoking was 3.3 years earlier than the age of onset of the schizophrenia (table 1). Moreover, none of the patients recruited in the current study were institutionalized up to the time of the current study. Kelly et al ⁽⁸⁾ also found that 90% of their patients were nicotine smokers 4 years prior to their illness onset. Also, Beratis et al ⁽¹²⁾ found that 86% of their patients start smoking before the schizophrenia onset. Perhaps the factors that predispose to schizophrenia predispose to nicotine smoking as well. An alternative explanation for such a high rate of nicotine smoking among schizophrenic patients

might be considering nicotine as an environmental etiological factor for schizophrenia through its potential for increasing dopamine neurotransmission ⁽¹⁰⁾. The last explanation (nicotine increasing dopamine activities) might be more plausible in regard of our findings, where we found that the time elapsed between starting cigarette smoking and the onset of schizophrenia (3.3 years), were significantly shorter than that of starting smoking and the onset of non-schizophrenia illnesses (7.7 years), with p value of 0.01 (table 1). De Leon et al ⁽¹¹⁾ reported that schizophrenics smoke before their first psychotic episode and that the disease therefore does not contribute to initiation of smoking, but to heavy smoking. Moreover, the self medication hypothesis has been criticized by Prochaska et al ⁽³¹⁾ in their analysis of more than 280 records of tobacco industries dating from 1955-2004. They concluded

that the researches that support the ideas that tobacco is not harmful for schizophrenic patients and that patients need smoking as a self medication, were monitored or directly funded by tobacco industries ⁽³¹⁾.

Gender effects:

Our study shows that male patients, from both groups, were more nicotine smokers than female patients. 59.03% of male schizophrenic patients were nicotine smokers compared to only 3.45% of female schizophrenic patients ($P < 0.000$) (table 1). Also, 41.34% of male non-schizophrenic patients were nicotine smokers compared to 7.18% of female non-schizophrenic patients ($P < 0.000$) (table 1). In an attempt to assess to which extends the gender might predict smoking behavior among the patients, logistic regression analyses done, with 95% confidence interval. Being male, increases the odd of smoking by 12.331 ($P = 0.000$) in both groups (table 2).

Moreover, among the schizophrenic group, being male increase the risk of nicotine smoking by odds of 55.878 ($P = 0.000$) (table 3). Among non-schizophrenic group, male gender increases the risk of nicotine smoking by odds of 9.489 ($P = 0.000$) (table 4). Although current gender differences were similar to studies conducted elsewhere^{8,12,18}, another possible explanation may play role in this difference is the cultural difference, where nicotine smoking among female population, in Middle East tradition generally and in Kurdish tradition more specifically, is more stigmatized^{27,28,32}. Such a culturally determined difference certainly will be reflected among psychiatric patients including schizophrenic patients.

Age effects:

In both groups, nicotine smoking started before the disorders onset. However, the risk of smoking, increased by odds of 1.032 for each year advance in age ($P = 0.001$) (table 2). Moreover, increase in age, was significant predictor for nicotine smoking among schizophrenic patients, with odds of 1.116 ($P = 0.000$) (table 3). Whereas it was not significant predictor among non-schizophrenic patients, with odds of 1.014 ($P = 0.185$) (table 4). Such difference might be due to the age difference between both samples, or might be due to that schizophrenia, perhaps, is a maintaining factor for nicotine smoking, possibly due to its potential effects on chemical neurotransmitters, for which to be proved, further future studies are necessary.

CONCLUSION:

Although nicotine dependence was prevalent among both schizophrenic and non-schizophrenic patients, the rate and severity of nicotine dependence were significantly higher among schizophrenic patients than non-schizophrenic patients. Gender and age were significant predictors for nicotine smoking in all psychiatric patients. Both groups started their smoking habit before their psychiatric morbidity onset. However, the onset of starting nicotine smoking was significantly closer to the onset of schizophrenia than non-schizophrenic psychiatric disorders. Findings of the current study amount more to an (Etiological) explanation than (Self Management) explanation of nicotine smoking among schizophrenic patients.

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