

Depression, Sexual Dysfunction, and Medical Comorbidities in Young Adults Having Nicotine Dependence

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Abstract

Background: Nicotine dependence, depression, diabetes mellitus, hypertension, and hypothyroidism are risk factors of sexual dysfunction. **Aims and Objectives:** The present study aims to find the prevalence of sexual dysfunction and the various sexual response cycle domains in individuals with nicotine dependence with and without comorbidities. **Materials and Methods:** A total of 52 individuals attending the tobacco cessation clinic were included in the study. To assess the primary outcome, Fagerstrom test for nicotine dependence, Arizona Sexual Experiences Scale, and Hamilton's Depression Rating Scale₁₇ had been administered after validation in local vernacular. **Results:** In the sample, 32 (61.5%) were male and 20 (38.5%) were female. The 17 participants (32.7%) met the criteria of low nicotine dependence, 5 (9.6%) participants met low to moderate, 11 participants (21.2%) had moderate dependence, and 19 (36.5%) participants met the criteria of high nicotine dependence. **Conclusions:** The nicotine dependence is directly related to sexual dysfunction, and it affects various stages of the sexual response cycle. One-quarter of individuals of nicotine dependence also met the threshold criteria of depression. The interventions as primary and primordial preventions with awareness building and health education may be a cost-effective measure to prevent tobacco-related deaths.

Keywords: Comorbidities, depression, Fagerstrom and Arizona Sexual Experiences Scale, nicotine dependence, young adults

INTRODUCTION

Sexual dysfunction and depression have a bidirectional relationship. Antidepressant drugs are notorious to cause sexual dysfunction as well. The optimal sexual functioning is necessary for better physical and psychological well-being. The sexual dysfunction is more common in females (43%) than in male participants (30%) in the Western community. The most common sexual dysfunction among women has been found as female hypoactive sexual disorder and in men, premature ejaculation, respectively.^[1,2] In the Zurich Cohort study, it has been found that sexual dysfunction is twice more common among young (28–35 years) depressed (major depression, recurrent brief depression, and dysthymia combined) individuals in comparison to their nondepressed control population.^[3] With paradigm shift of societal norms, nicotine dependence is on rise among females. There is gross underreporting and inadequate assessment of sexual dysfunction among depressed individuals.^[4]

The erectile function is regulated by the interplay of neurohormonal-vascular factors guided by psychosocial influences.

The central nervous system control and relationship with sexual arousal has been demystified. The sympathetic system is inhibitory to erectile reflex, whereas parasympathetic system is excitatory to erectile reflex. Hence, an autonomic balance is must for erection to happen, as hypothalamic control is essential for erection. The paraventricular and preoptic nucleus stimulation is pro-erectile. The midbrain, on the other hand, is inhibitory to erection, especially perigeniculate nucleus of the midbrain inhibits erection.

MATERIALS AND METHODS

The 52 individuals from the age group of 18–45 years of both sexes attending the outpatient department of a tertiary

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medical college and hospital from India, who have been referred from other departments have been included in the study by systemic random sampling method. The three major comorbidities hypertension, Type 2 diabetes mellitus (DM), and hypothyroidism have been also enquired and investigated. The Hamilton’s Depression Rating Scale (HAM D) and Arizona Sexual Experiences Scale (ASEX) scales are administered among the participants. The sexual dysfunction in individuals with nicotine dependence is the primary outcome measure in this study. The prevalence of depression and other medical comorbidities has been determined by secondary outcome measures.

There are other scales available apart from ASEX scale such as Dickson Glazer scale for the assessment of sexual functioning inventory,^[5] psychotropic-related sexual dysfunction,^[6] Sexual Functioning Scale,^[7] sexual Functioning Questionnaire,^[8] Brief Index for Sexual Functioning (BISF),^[9] Brief Sexual Functioning Questionnaire, and^[10] Sexual Symptom Distress Index.^[11]

The ASEX is a very simple tool that can be administered to assess different domains of sexual functioning which has five simple questions covering desire, arousal, penile erection or vaginal lubrication, orgasm, and satisfaction areas. The possible scores range from 5 to 30 with higher scores indicating more severe sexual dysfunction. It has high internal consistency (Cronbach’s alpha), test–retest reliability, and concurrent validity. The total ASEX score >19, any single item score >5, and any two items score >4 signify the presence of sexual dysfunction. There are more descriptive scales such as BISF, but ASEX is easier to apply and found very useful to detect sexual dysfunction in both sexes. Although this scale does not give a clue to etiology of sexual dysfunction, it has very high positive and negative predictive value.^[12]

Fagerstrom test for nicotine dependence (FTND) is a very simple and easy to administer test having six questions. The interpretation is simple, Score 1–2 suggests low dependence, 3–4 implies low-to-moderate dependence, 5–7 should be considered as moderate dependence, and 8+ score denotes high dependence. The persons who score 1–2 in FTND may not require nicotine replacement therapy (NRT); however, they should be closely monitored. Those who score 3–4 could be offered nicotine patch, gum, lozenges, and inhalers. The individual who scores 5–7 could be offered the same therapy Weither in isolation or

in combination. The high-dependent individuals (more than 8 score in FTND) should be offered monotherapy or combined therapy, but require more close supervision, follow-up, and intensive motivation enhancement therapy. The severity is graded with FTND and the management is given as per NRT recommendation from clinical guidelines part 7.^[13]

Each subitems have classification of symptoms which can be scored in a Likert scale of 0–2 (where scoring may be difficult to obtain; 0 = absent, 1 = doubtful or trivial, and 2 = present) or 0–4 (where more detailed information could be obtained and can be expanded to 0 = absent, 1 = mild, 2 = moderate, 3 = severe, and 4 = incapacitating). The higher the HAM D 17 total score, the more severe is the depression (10–13 = mild, 14–17 = mild to moderate, >17 = moderate to severe).^[14] Thus, the above-mentioned scales namely ASEX, Fagerstrom’s questionnaire (FQ), and HAM D 17 were applied among the study participants in local vernacular after validating in a pilot study.

RESULTS

The 32 participants are male (61.5%) and twenty participants are female (38.5%). Ten participants (19.2%) had been diagnosed to have Type 2 DM, seven participants had been

Table 1: Frequency table of different variables (n=52)

Variables	Frequency (%)
Sex	
Male	32 (61.5)
Female	20 (38.5)
Type 2 diabetes mellitus	
Hypertension	
Present	7 (13.5)
Hypothyroidism	
Present	11 (21.2)
Depression	
Present	13 (25.0)
Mild	7 (13.5)
Moderate	5 (9.6)
Severe	1 (1.9)
Nicotine dependence (based on Fagerstrom test)	
Low dependence	17 (32.7)
Low-to-moderate dependence	5 (9.6)
Moderate dependence	11 (21.2)
High dependence	19 (36.5)

Table 2: Descriptive statistics and case summaries

Measures of dispersion	Age	HAM D 17	ASEX drive	ASEX arousal	ASEX erection	ASEX orgasm	ASEX satisfaction	ASEX total	FQ
n	52	52	52	52	52	52	52	52	52
Mean	28.54	8.29	2.33	2.42	2.87	2.92	2.77	13.31	5.92
Median	27.00	7.00	2.00	2.00	3.00	3.00	3.00	13.00	6.00
Minimum	19	5	1	1	1	1	1	5	1
Maximum	44	18	6	6	6	6	6	28	12
SD	6.506	3.127	1.530	1.526	1.692	1.667	1.516	7.280	3.767

SD: Standard deviation, HAM D 17: Hamilton’s Depression Rating Scale, ASEX: Arizona Sexual Experiences Scale, FQ: Fagerstrom’s Questionnaire

Table 3: Descriptive statistics

Variable	Mean±SD	n
Age	28.54±6.506	52
Marriage duration	6.42±4.860	52
HAM D17	8.29±3.127	52
ASEX drive	2.33±1.530	52
ASEX arousal	2.42±1.526	52
ASEX erection	2.87±1.692	52
ASEX orgasm	2.92±1.667	52
ASEX satisfaction	2.77±1.516	52
ASEX total	13.31±7.280	52
FQ	5.92±3.767	52

SD: Standard deviation, HAM D 17: Hamilton's Depression Rating Scale, ASEX: Arizona Sexual Experiences Scale, FQ: Fagerstrom's Questionnaire

diagnosed as hypertensive (13.5%), 11 participants had hypothyroidism (21.2%), and 13 (25%) patients with nicotine dependence met the criteria of depression in HAM D 17 scale [Table 1].

The mean age of the sample was 28.54 (standard deviation [SD] = 6.51) with marriage duration 6.42 years (SD = 4.86) and HAM D 17 score 8.29 (3.13). A total of 13 participants (25%)

out of 52 met the criteria of depression as per HAM D 17 rating scale with mild (n = 7; 13.5%), moderate (n = 5, 9.6%), and severe (n = 1.9; 7.7%). Among the participants, 17 (32.7%), 5 (9.6%), 11 (21.2%), and 19 (36.5%) met the criteria of low, low to moderate, moderate, and high dependence on nicotine, respectively, in FQ [Table 2]. The score in FQ is 5.92 ± 3.767, which suggests moderate-to-severe nicotine dependence in the study population [Table 3]. The average normal scores in ASEX for adults with and without clinical sexual dysfunction are 21 and 20 and 14 and 10 in women and men, respectively [Table 2].

The age negatively correlated with arousal (Pearson's = 0.472, P < 0.001) and sexual drive (Pearson's = 0.590, P < 0.000). The duration of marriage is negatively correlated with ASEX drive (Pearson's = 0.0743, P < 0.000) and ASEX arousal subscales (Pearson's = 0.576, P < 0.000). HAM D 17 total score is also negatively correlated with ASEX drive (Pearson's = 0.574, P < 0.000), ASEX arousal (Pearson's = 0.373, P < 0.001), ASEX erection subscale (Pearson's = 0.434, P < 0.001), and ASEX orgasm subscale (Pearson's = 0.309, P < 0.026) but not with ASEX satisfaction subscale (Pearson's = 0.209, P < 0.138). ASEX total subscale (Pearson's = 0.414, P < 0.002) is directly

Table 4: Correlation matrix between age, marriage duration, Hamilton's Depression Rating Scale 17, and Fagerstrom's Questionnaire

	Pearson's significance			
	Age	Marriage duration	HAM D 17	FQ
Age	1	0.922, 0.00	0.663, 0.000**	0.307, 0.027*
Marriage duration	0.922, 0.000**	1	0.739, 0.000**	0.361, 0.009**
HAM D 17	0.663, 0.000**	0.739, 0.000**	1	0.272, 0.002**
ASEX drive	0.590, 0.000**	0.0743, 0.000**	0.574, 0.000**	0.668, 0.000**
ASEX arousal	0.472, 0.000**	0.576, 0.000**	0.373, 0.000**	0.726, 0.000**
ASEX erection	0.434, 0.001**	0.560, 0.000**	0.434, 0.001**	0.810, 0.000**
ASEX orgasm	0.293, 0.035*	0.413, 0.002**	0.309, 0.026*	0.830, 0.000**
ASEX satisfaction	0.277, 0.047*	0.312, 0.025*	0.209, 0.138	0.732, 0.000**
ASEX total	0.449, 0.001**	0.566, 0.000**	0.414, 0.002**	0.823, 0.000**
FQ	0.307, 0.027*	0.361, 0.009*	0.272, 0.051	1

*Significance P<0.05. **Significance P<0.01. FQ/FTND=Fagerstrom's Questionnaire/Fagerstrom test of nicotine dependence, HAM D 17: Hamilton's Depression Rating Scale, ASEX: Arizona Sexual Experiences Scale, FQ: Fagerstrom's Questionnaire

Table 5: Correlation matrix between Arizona Sexual Experiences Scale total and subscales

	Pearson's significance					
	ASEX drive	ASEX arousal	ASEX erection	ASEX orgasm	ASEX satisfaction	ASEX total
Age	0.590, 0.00**	0.472, 0.001**	0.434, 0.000**	0.293, 0.035*	0.277, 0.047*	0.449, 0.001**
Marriage duration	0.743, 0.000**	0.576, 0.00**	0.560, 0.000**	0.413, 0.035*	0.312, 0.025*	0.566, 0.000**
HAM D 17	0.574, 0.000**	0.373, 0.007**	0.434, 0.000**	0.309, 0.026*	0.209, 0.000**	0.414, 0.002**
ASEX drive	1	0.796, 0.000**	0.805, 0.000**	0.725, 0.000**	0.540, 0.000**	0.843, 0.000**
ASEX arousal	0.796, 0.000**	1	0.934, 0.000**	0.861, 0.000**	0.713, 0.000**	0.940, 0.000**
ASEX erection	0.805, 0.000**	0.934, 0.000**	1	0.942, 0.000**	0.813, 0.000**	0.982, 0.000**
ASEX orgasm	0.725, 0.000**	0.861, 0.000**	0.942, 0.000**	1	0.854, 0.000**	0.959, 0.000**
ASEX satisfaction	0.540, 0.000**	0.713, 0.000**	0.813, 0.000**	0.854, 0.000**	1	0.856, 0.000**
ASEX total	0.843, 0.000**	0.940, 0.000**	0.982, 0.000**	0.959, 0.000**	0.856, 0.000**	1
FQ	0.668, 0.000**	0.726, 0.000**	0.810, 0.000**	0.830, 0.000**	0.732, 0.000**	0.823, 0.000**

*P< 0.05, **P< 0.01. HAM D 17: Hamilton's Depression Rating Scale, ASEX: Arizona Sexual Experiences Scale, FQ: Fagerstrom's Questionnaire

correlated with depression, but no correlation has been found with FQ total score (Pearson's $r = 0.272$, $P < 0.051$) and depression in the present study [Tables 3 and 4]. The correlation matrix shows decrease drive, arousal, erection ($P < 0.01$), orgasm, and satisfaction ($P < 0.05$) with aging. There is an inverse correlation of sexual drive, arousal, erection, total ASEX score ($P < 0.01$), and satisfaction ($P < 0.05$) subscales with the duration of marriage. The higher the scores in HAM D 17 scale, there is more reduction in sexual drive, arousal, erection ($P < 0.01$), orgasm, and ASEX total score ($P < 0.05$). Similarly, the severity of nicotine dependence affects directly sexual drive, arousal, erection, orgasm, ASEX total score ($P < 0.01$), and satisfaction score ($P < 0.05$) [Tables 4 and 5].

DISCUSSION

The sample group represents young, sexually active group with more male participants as they come to seek treatment in tobacco cessation unit. Similar result has been found in female participants and in other cases of codependency in previous studies.^[15,16] Nicotine dependence, hypothyroidism, diabetes, and hypertension are in descending order comorbid with depression. Although sample characteristics favor young population, following the global trend, the prevalence of diabetes (19.2%) and hypertension (13.5%) is significant in younger population. One-fourth of the study population having nicotine dependence is also suffering from depression, the finding which replicates the previous studies.^[17] Only 1.9% of participants met the threshold criteria of severe depression. Most of the participants attending the tobacco cessation unit diagnosed to have severe nicotine dependence (36.5%). Sexual dysfunction is directly correlated with higher age, duration of marriage, and severity of nicotine dependence. Among the various domains of sexual dysfunctions, sexual drive, arousal, and erections are affected more than orgasm and satisfaction score. With increasing age, there is a decrease in sexual drive and arousal in both sexes.

CONCLUSIONS

The major medical comorbidities have been found to be associated with nicotine dependence are Type 2 DM (19.2%), hypertension (13.5%), and hypothyroidism (29.2%) in this study, which is higher than the prevalence in the general population. The minimum and maximum scores on ASEX total have been found 5 and 28, respectively, in the present study with a mean (13.31) and SD (7.280).

The study is unique in its perspective that it was carried out in a special clinic of tobacco cessation unit where NRT is being offered. The comorbid diabetes, hypertension, depression, and sexual dysfunctions are being correlated with nicotine dependence under the same roof. A comprehensive lifestyle modification clinic may be operated where the same strata of

individuals will attend as they will be more receptive at this stage. However, the sample size was only modest. A large-scale population-based study is required to extrapolate the findings of the present study.

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Conflicts of interest

There are no conflicts of interest.

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