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Severity of Nicotine Withdrawal Symptoms after Smoking Cessation

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ABSTRACT

Background: Smoking is among the most common preventable causes of early death in the world. Implementation of smoking cessation programs is among the effective strategies of tobacco control. More than half the smokers experience nicotine withdrawal syndrome after quitting and this could be one of the main reasons of unsuccessful smoking cessation. This study evaluated the severity of nicotine withdrawal symptoms 14 days after quitting (the last visit of smokers to the smoking cessation clinic).

Materials and Methods: This was a cross sectional study conducted on volunteers for smoking cessation from Nov. 2006 to Nov. 2007. During a one month course, volunteers attended 4 sessions of treatment and training (1 session per week). Since the 2nd session, they stopped smoking with the aid of nicotine gum and behavioral therapy under the supervision of a physician. Fourteen days after quitting (4th session), the severity of nicotine withdrawal symptoms was evaluated using the Minnesota test and was compared between males and females using the Chi square test.

Results: A total of 197 participants were studied, 65% of which were males, 76.6% were married, 49.2% successfully quit smoking during the study period, 12.2% cut down smoking, and 38.6% did not finish the course. The mean score for increase in appetite, irritability and depression was 4.6 ± 3.4 , 4.3 ± 3.4 and 3.6 ± 3.3 , respectively. The mean score for severity of depression was 4.5 ± 3.4 in women and 3.19 ± 3.2 in men ($p=0.03$). The mean score for severity of anxiety was 4.6 ± 3.6 in women and 2.6 ± 2.9 in men ($p=0.004$). Also, the mean score for severity of irritability was 5.7 ± 3.3 and 3.6 ± 3.3 in women and men, respectively ($p=0.002$).

Conclusion: The severity of symptoms related to nicotine withdrawal syndrome was considerably low 14 days following abstinence. However, the severity of nicotine craving was significantly higher compared to other symptoms. Severity of more than half the symptoms was significantly higher in women but further investigations are required in this regard. (**Tanaffos 2010; 9(1): 42-47**)

Key words: Nicotine withdrawal syndrome, Smoking cessation, Cigarette

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INTRODUCTION

According to the rate of tobacco-related morbidity and mortality, every 6 seconds a person dies due to the smoking-related complications (1). If this pattern of usage continues, 500 million morbidity and mortality will occur due to tobacco consumption by 2030 (2). Many smokers would like to quit smoking but they are unable to do so as the result of nicotine dependence (3). Nicotine is strongly addictive. It is quickly absorbed by the lungs. The rate of nicotine absorption by the lungs is almost similar to venous absorption (3). Due to the quick disappearance of nicotine effects following abstinence, smokers usually experience nicotine withdrawal syndrome resulting in continuation of smoking (4). Each year, 70% of smokers consider quitting smoking, 40% try to quit, and without any intervention 1-3% successfully quit smoking (5). Inability to tolerate nicotine withdrawal syndrome is the reason for many unsuccessful attempts of smoking cessation, continuation of use, and relapses following cessation (6). Nicotine dependence has both positive and negative sides. The positive side of dependence is the pleasure experienced during the first seconds of nicotine consumption. The negative side is consumption for the purpose of avoiding nicotine withdrawal symptoms (7). These symptoms include cigarette craving, depression, insomnia, irritability, nervousness, anxiety, difficulty concentrating, restlessness and weight gain (8). Most smokers who quit smoking experience nicotine withdrawal symptoms due to their nicotine dependence. Usually the symptoms are most severe during the first 3 days following cessation but may continue for weeks. Even symptoms like craving and urgently needing a cigarette may continue to show up for months after quitting. The severity of these symptoms depends on the number of cigarettes smoked daily and duration

of usage (9).

Women are less successful in quitting smoking than men (10). Nicotine withdrawal symptoms are more severe in women and nicotine replacement therapy is less effective in them (11).

In April 2005, a study was performed in National Institute on Drug Abuse regarding the effect of nicotine replacement therapy on treating the nicotine withdrawal symptoms in women showing that the reason for a more difficult cessation in women is the fact that nicotinic drugs cannot effectively treat these symptoms in women (12).

Another study conducted in 2006 evaluated the nicotine withdrawal syndrome developed following smoking cessation in teenagers who used to smoke weekly or monthly. It showed that 55.9% of weekly smokers and 47.1% of the total understudy population experienced more than 2 symptoms of nicotine withdrawal syndrome one week after quitting (13).

This study aimed to evaluate the severity of nicotine withdrawal symptoms in participants of smoking cessation courses on day 14 after quitting and compare it between males and females. Day 14 was the last session of the course and on this day, participants' success in quitting smoking as well as the severity of nicotine withdrawal symptom in them was evaluated. Our study results can be used for revising the therapeutic methods used in the smoking cessation clinic.

MATERIALS AND METHODS

This was a descriptive cross sectional study conducted on the participants of smoking cessation programs in the cessation clinic of NRITLD during a one year period. All the attendants were supervised by a physician. The volunteers were treated and

trained in 4 sessions each 1.5 hours during a one month period. The demographic data characteristics of participants including age, sex, marital status, occupation and level of education were collected by using a self-designed questionnaire. Specific information regarding tobacco consumption like level of nicotine dependence was measured using the 10-score Fagerstrom test. Their reasons for smoking were evaluated by using the International Union Against Tuberculosis and Lung Disease (IUATLD) and WHO tests. Number of cigarettes smoked per day and duration of use (years) were determined based on the smoker's report. In the treatment section of the questionnaire, type of medication and its method of use, number of missed sessions and the outcome of the course were questioned. To confirm the abstinence, despite the personal statement, the expiratory CO of the cases was measured by a device (Micro Medical Limited, Rochester, Kent ME12AZ England). Since the second session, participants stopped smoking by using nicotine gums and help of a physician. In this study, we evaluated the severity of nicotine withdrawal symptoms on day 14 following quitting since it was the last visit of participants to the clinic. As mentioned earlier, usually the symptoms are most severe during the first days after quitting but they usually subside after 10 to 14 days. We used the Minnesota test to evaluate the severity of these symptoms. The test evaluates the severity of 9 major signs/symptoms of nicotine withdrawal syndrome including cigarette craving, depression, irritability, sleepiness, drowsiness, anxiety, difficulty concentrating, restlessness, increased appetite and insomnia. Validity and reliability of the Minnesota test have been approved in previous studies. In this test, severity of symptoms is assessed and categorized on a scale of 0 (no symptom) to 10 (most severe). Levels 1 to 3 are considered as mild, 4 to 6 as moderate and 7 to 10 as

severe. According to Table 2 the mean severity of all symptoms on the day of study was below 5 (mild to moderate).

Statistical analysis:

Data were analyzed using SPSS version 11.5. The mean severity of nicotine withdrawal symptoms was calculated. T-test was used to assess the relation between the severity of symptoms and age and also the difference in the severity of different symptoms. $P < 0.05$ was considered significant.

RESULTS

A total of 197 people with the mean age of 39.4 ± 11.4 Yrs were evaluated in this study out of which, 128 (65%) were males and 69 (35%) were females, 151 (76.6%) were married, 82 (42.7%) were businessman, and 74 (37.6%) had college or bachelor's degree. Table 1 shows demographic information of participants.

Table 1. Demographic information of under study population

Participants	Number (%)	
Gender	Male	128 (65)
	Female	69 (35)
Marital status	Married	151 (76.6)
	Single	46 (23.4)
Level of education	Below diploma	6 (3)
	High school diploma	73 (37.1)
	College or bachelor's degree	74 (37.6)
	Higher degrees	44 (22.3)
Occupation	Employee	31 (16.1)
	Businessman	82 (42.8)
	Housewife	34 (17.7)
	Retired	20 (10.4)
	Student	4 (2.1)
	Unemployed	13 (6.8)
	Other	8 (4.2)

The mean number of cigarettes smoked per year (pack/year) was 17.3±14.9, the mean score of Fagerstrom test was 5.6±2.7 and the mean number of nicotine gum used by each participant was 5.6±4.9.

Overall, 79.6% of cases had increased appetite, 79% had irritability and 74.2% had cigarette craving (Figure 1).

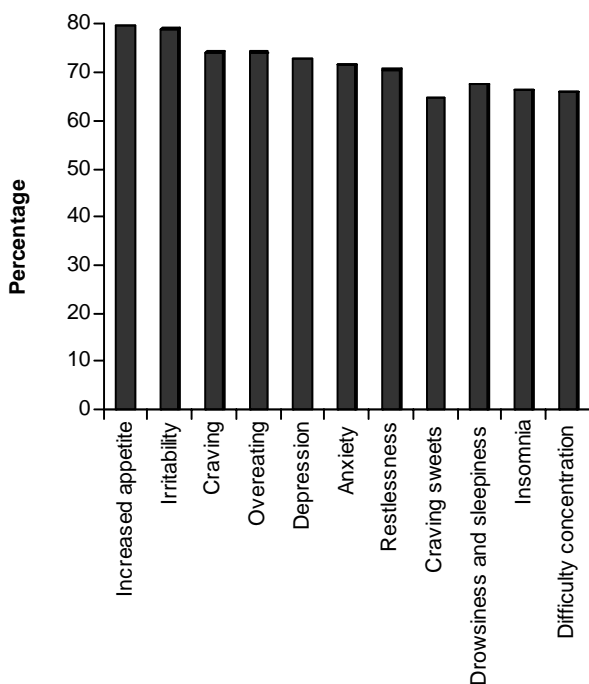


Figure 1. The frequency of nicotine withdrawal symptoms after abstinence (percentage)

In terms of outcome at the end of the course, 97 cases (49.2%) successfully quit smoking, 24 people (12.2%) cut down smoking and 76 (38.6%) did not finish the course.

In general, 33.5% of women and 52.3% of men successfully quit smoking, 15.9% of females and 10.2% of males cut down smoking and 40.6% of women and 37.5% of men did not complete the course (P=0.3).

The mean severity score for craving was 4.7±3.9, this rate was 4.6±3.4 for increased appetite and 4.3±3.4 for irritability (Table 2).

Table 2. The mean severity of nicotine withdrawal symptoms 14 days after abstinence

	Number	Minimum	Maximum	Mean	Standard deviation
Depression	110	0	10	3.6	3.35
Sleepiness	111	0	10	3.5	3.37
Insomnia	110	0	10	3.5	3.3
Craving	112	0	10	4.7	3.9
Increased appetite	112	0	10	4.6	3.46
Restlessness	112	0	10	3.8	3.53
Difficulty concentrating	112	0	10	2.8	3.05
Anxiety	112	0	10	3.3	3.33
Irritability	113	0	10	4.3	3.44

The mean severity of more than half the symptoms was significantly higher in women 14 days after the abstinence. The mean frequency of anxiety and irritability was also significantly higher in females (Figure 2). No significant difference was found between males and females in terms of number of nicotine gums used and level of nicotine dependence. However, the mean number of cigarettes smoked per year (pack/year) was significantly higher in men (P=0.01).



Figure 2. The mean severity of nicotine withdrawal symptoms according to gender

In our study no significant difference was found in terms of successful quitting between males and females.

DISCUSSION

The main finding of this study was the low severity of nicotine withdrawal symptoms 14 days after quitting by using nicotine gums. Although all the symptoms of nicotine withdrawal syndrome (anxiety, depression, insomnia, drowsiness, craving, increased appetite, difficulty concentrating, restlessness and irritability) were reported on day 14, the mean severity of these symptoms was below 5 (low) on a scale of 0 to 10. This finding was in accord with that of other studies conducted worldwide. The appropriate method of treatment adopted by the smoking cessation clinic helped decreasing the symptoms as well. Low severity of these symptoms is also explainable by the normal course of this syndrome (Table 2).

The frequency and severity of cigarette craving were significantly higher than those of other symptoms like irritability, increased appetite, anxiety and depression ($P < 0.002$).

A study conducted in the mental health department of a hospital in London on people who quit smoking in a one month period with the help of nicotine gums showed that symptoms like irritability, depression, difficulty concentrating and restlessness had the highest frequency but turned to normal after 4 weeks. Craving was the most severe problematic symptom in the first week after quitting (14). This was in concord with our study finding that the mean frequency/severity of craving 2 weeks after quitting was higher than that of other symptoms.

In a study by Etter JF., on recent ex-smokers who had quit smoking less than 14 days before baseline, all scores except appetite-weight gain decreased between baseline and the 17-day retest. In baseline ex-smokers who relapsed to smoking at the 17-day retest, appetite-weight gain decreased and craving increased between baseline and retest (15).

Hughes JR in his study tested the ability of nicotine to alleviate the tobacco withdrawal syndrome. Nicotine gum reduced the increase in irritability, anxiety, difficulty concentrating, restlessness and impatience that subjects reported

after cessation. Nicotine did not reduce the increases in cigarette craving, hunger, eating or insomnia after cessation (16).

Considering the fact that our under study population were using nicotine gums, more time or maybe some other medications are required to decrease their cigarette craving. Presence of a significant difference in the severity of symptoms between men and women was another important finding.

Our finding regarding the higher severity of nicotine withdrawal syndrome in women was in accord with that of other studies. Also, it is a consensus that smoking cessation is more difficult in women.

Hatsulami in his study reported higher frequency of nicotine withdrawal symptoms in women who used nicotine gums for quitting smoking compared to similar men. Also, the severity score of craving, anxiety, and eating was significantly greater in women (16).

In a study by Panday conducted in the Netherlands, the level of nicotine dependence and the frequency of nicotine withdrawal symptoms especially depression were higher in females (13).

A review study entitled "effectiveness of the nicotine patch in suppressing nicotine withdrawal symptoms in women versus men" conducted in April 2005 by the National Institute on Drug Abuse, reported the smoking cessation to be more difficult in women. The reason was stated to be the ineffectiveness of nicotine replacement therapy in treating nicotine withdrawal symptoms in women (12). Another study revealed that frequency of non-nicotine reinforcements as determinants of tobacco smoking was greater in women than in men (17).

Further studies are required on the effect of nicotine replacement therapy on women. There is a possibility that nicotine withdrawal syndrome in women is influenced by factors such as women's hormonal status, their emotional or mental state and their habitual dependence to smoking. More investigations are required in this regard. To evaluate

the course of nicotine withdrawal syndrome, it is recommended that the frequency and severity of symptoms be evaluated repeatedly with short intervals starting 24 hours after the abstinence. In this manner, the course and severity of symptoms can be evaluated precisely.

In conclusion, severity of nicotine withdrawal symptoms was low 14 days after the abstinence by using nicotine gum. Among the symptoms, cigarette craving was more frequent and severe. The severity score of more than half the symptoms was greater in women.

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