Brief Report

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TANAFFOS

Smoking Rates and Disease Severity in COVID-19 Patients at Masih Deneshvari Hospital

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Background: Considering that smoking is a major risk factor for respiratory diseases and viral infections, in this study, we investigated the smoking status in patients admitted with the diagnosis of COVID-19 at Masih Daneshvari Hospital.

Materials and Methods: The information was obtained through the registration of patients' information in the hospital.

Results: A total of 776 patients with COVID-19 who were admitted to Masih Daneshvari Hospital from April 2019 to June 2020 were examined, among whom 422 were men (54.4%), and 352 were women (45.5%). The mean age of the studied patients was 55.7 with a standard deviation of 15.9. The mean duration of hospitalization was 10.3 days with a standard deviation of 6.7 days. 178 (23.4%) patients were smokers. 45 smokers (25.3%) were hospitalized for more than 3 weeks, while 35 (6%) non-smokers were hospitalized for more than 3 weeks ($p<0.05$). There was no significant difference between smokers and non-smokers in terms of hospitalization in the intensive care unit and mortality.

Conclusion: The significant finding is the high prevalence of smoking in the patient population, which should be taken into consideration. The higher length of hospitalization in smokers is also a notable finding that can cause problems for the health system and patients. Encouragement to quit smoking should be considered in health programs.

Keywords: Smoking; COVID-19; Tobacco; Hospitalization; Duration

INTRODUCTION

COVID-19 is a respiratory infection caused by the coronavirus as acute respiratory syndrome. Since the first case was reported in Wuhan, China, in 2019, the virus has spread globally.

Although many people with COVID-19 are asymptomatic, in some cases, severe symptoms, including lung involvement, are seen (1-3). These acute complications are more likely in older people and those with underlying cardiovascular disease, diabetes, and COPD. The likelihood of death could also be higher despite the aforementioned risk factors (4,5).

Such epidemics can affect the behavior and attitude of smokers. Smokers may consume more tobacco due to stress caused by pandemic conditions (6). On the other hand, some smokers may be more motivated to quit due to their belief that the COVID-19 disease is more severe due to continuing smoking.

The COVID-19 disease (coronavirus) may put smokers at a higher risk. Taking your hand to your mouth when smoking can accelerate the transmission of infection.

One of the health recommendations during the epidemic was to avoid touching the eyes, mouth, and nose with unwashed hands, as this can facilitate viral transmission. Smoking causes damage to the lungs and weakens the immune system, which further increases the risk of respiratory infection and disease progression.

There is limited evidence that tobacco affects the severity of Covid disease. A recent study found that smoking doubles the risk of severe COVID-19 (7). Mehra and colleagues have examined the association between tobacco use and death in hospitalized patients, and based on the results, smoking was associated with an increased risk of mortality (8).

In this study, the rate of smoking in a population of infected COVID-19 patients at the Masih Daneshvari Hospital was estimated and compared with the prevalence of smoking in the general population. We also studied the association between tobacco use and complications from the disease, including the need for intensive care unit, length of hospital stay, and mortality.

MATERIALS AND METHODS

This was a descriptive cross-sectional study conducted on patients hospitalized with a diagnosis of COVID-19 at Masih Daneshvari Hospital from April 2019 to June 2020. A total of 776 patients admitted with the diagnosis of COVID-19 were examined through coordination with the Patient Information Registration Center of Masih Daneshvari Hospital. Demographic variables, smoking status, duration of hospitalization in the ward, hospitalization in the intensive care unit, and mortality rate were investigated through the information recorded in the hospital's disease registry center.

This project was approved by the Ethics Committee of the National Institute of Tuberculosis and Lung Diseases (Ethical code: IR.SBMU.NRITLD.REC.1400.120).

Statistical methods

The obtained information was statistically analyzed in SPSS version 11 software. Quantitative variables were expressed numerically, and qualitative variables were expressed as percentages. Descriptive analysis was done to check the distribution of the investigated factors. Bivariate analyses were performed to calculate the distribution of different demographic factors and other independent variables. Chi-square tests and the exact spread test were used for dichotomous variables, and finally, the odds ratio and 95% confidence interval were calculated for each variable. In all analyses, the significance level of $p<0.5$ was considered.

RESULTS

The number of 776 patients infected with COVID-19 with a positive PCR test who were admitted to Masih Daneshvari Hospital between April 2019 and June 2020 were examined. Among them, 422 (54.4%) were men. The mean age of the studied patients was 55.7 with a standard deviation of 15.9. 178 (23.4%) of the patients were smokers. The mortality rate, hospitalization in the intensive care unit, and the length of hospitalization are shown in Table 1.

The duration of hospitalization according to smoking is shown in Table 2.

Table 1. Mortality rate, hospitalization in special care, and duration of hospitalization in the subjects studied

Admit in ICU	Yes	100 (14.7)
	No	592 (85.3)
Length of hospitalization	7 days or less	297 (39.1)
	2-3 weeks	382 (50.3)
	more than 3 weeks	80 (10.3)
Mortality	Dead	72 (9.4)
	Alive	697 (90.6)

Table 2. Duration of hospitalization according to the smoking status

		Length of hospitalization			p
		7 days or less	2-3 weeks	more than 3 weeks	
Smoking status	Smoker	51 (28.7)	82 (46.1)	45 (25.3)	<0.05
	Nonsmoker	246 (42.4)	299 (51.6)	35 (6)	

15 (15.2%) of the smokers and 85(14.6%) of the non-smokers were admitted to the intensive care unit (P=0.8).
Among deaths that occurred during hospitalization, 11.9% were smokers and 8.8% were non-smokers (P=0.1).
In terms of length of hospitalization, 133 men (39.3%) were hospitalized for less than 7 days, 181 (53.6%) between 8 and 21 days, and 24 (7.1%) for more than 21 days. In women, 150 people (43.7%) were hospitalized for less than 7 days, 173 people (50.4%) were hospitalized for 8-21 days,

and 20 people (5.8%) were hospitalized for more than 21 days (P=0.6).

Thirty-two men (8.3%) and 29 female patients (9.4%) died (P=0.9). Duration of hospitalization in different age groups is shown in Table 3.

Table 3. Duration of hospitalization according to age group

		Length of hospitalization			p
		7 days or less	8-21 days	more than 21 days	
Age group	<20	4 (44.4)	5 (55.6)	0	0.001
	20-35	48 (65.5)	23 (25)	10 (9.7)	
	35-55	118 (44.7)	142 (50.6)	27 (4.7)	
	>55	127 (34.6)	212 (58.2)	43 (7.2)	

One person (11.1%) died in the age group below 20 years, 2 people (2.4%) in the age group 20-35 years, 14 people (4.8%) in the age group 35-55 years, and in the age group over 55 years old, 55 people (14.3%) have died (P=0.001).

DISCUSSION

The most important debatable finding in this study is the high prevalence of smoking in the studied patients compared to the general population. Another significant finding is the longer duration of hospitalization in smokers than in non-smokers. These findings are consistent with the results of a prospective cohort study; based on its results, smokers had more symptoms and signs than non-smokers, which led to the need for more hospitalization in them than in non-smokers.

The results of this study showed the relationship between the current smoking rate and the risk of COVID-19 and subsequent long-term hospitalization. The prevalence of smoking (cigarettes) in the patient population is higher than the prevalence of smoking in the general society of Iran. This result can refer to the role of tobacco in the development and progression of viral diseases such as COVID-19. According to the latest surveys, the prevalence of smoking in Iran is about (14.3%). Gender distribution in the studied patients with COVID-19 was also similar to the general population in terms of smoking, and men were significantly more smokers than women. (37.8% of men versus 6.4% of women) (9).

Many studies have shown that the amount of smoking in people with COVID-19 is similar to that of the normal population, and even in some studies, it is lower than the general population (10). A review of 174 cohort studies has shown a low number of active smokers among cases with COVID-19 infection. The prevalence of smoking among symptomatic people with COVID-19 was significantly lower than in the general population (10). In another study, a negative relationship between the prevalence of smoking and the occurrence of COVID-19 has been identified among 38 European countries (11).

The results of our study showed a higher prevalence rate. Of course, according to the type of study, a causal relationship between smoking and COVID-19 cannot be considered, but the high number of smokers in hospitalized patients is a point worth considering.

Based on the results of our study, the length of hospital stay in smoking patients was significantly longer than that of non-smokers; 25.3% of smokers were hospitalized for more than 3 weeks compared to 6% of non-smokers who were hospitalized for more than 3 weeks (P<0.05). The duration of hospitalization is an important factor that can put pressure on the health system, especially during a crisis and epidemic conditions. Smoking can delay the course of the disease and the healing process. The duration of hospitalization in this study was significantly higher in older people. According to the results of a study conducted on the duration of hospitalization of COVID-19 patients and the factors affecting it in Bam city, the duration of hospitalization was longer in older people and men. In the same study, the duration of hospitalization for patients has increased due to respiratory and cardiac diseases, and diabetes (12).

According to the results of a study in Yazd, having a history of heart and lung disease and diabetes increases the length of hospitalization in COVID-19 patients (13).

The results of another study showed that ex-smokers had more hospitalizations and more deaths from COVID-19 than current smokers and non-smokers, which is probably related to the age and complications related to ex-smokers (14).

The need for hospitalization in the intensive care unit and mortality in smoker patients showed no significant

difference from non-smokers. 11.9% of smokers with COVID-19 died compared to 8.8% of non-smokers. Of course, our study population was small (776 patients), and we considered smokers only as active smokers who smoke daily, and the classification of smokers was based on the consumption of at least one cigarette per day at the time of illness, regardless of the severity of nicotine dependence or former users who have now quit. The results of a meta-analysis study have shown that smoking is an independent risk factor for severe COVID-19 and death (15).

Smoking may increase the risk of spreading COVID-19 with related biological and behavioral effects. Smoking disrupts the activity of the respiratory system and weakens the immune system against infections. The results of our study are consistent with the results of many similar studies in the world. The prevalence of smoking in patients with COVID-19 is higher than in the normal population, and the duration of hospitalization in smokers is longer than in non-smokers.

CONCLUSION

Smoking can be a contributing factor to the severity of COVID-19 (such as the need for hospitalization and increased length of stay). Therefore, tobacco prevention and control interventions are recommended to reduce the severity and complications of this disease.

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