Post-COVID Syndrome in Healthcare Workers

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Abstract

AIM: Some of the patients with COVID-19 disease have persistent symptoms and there is limited information about the long-term health consequences of those who have recovered. The aim of this study is to investigate persistent symptoms of health care workers after COVID-19 disease and the relationship with demographic and clinical characteristics of the patients. METHOD: Healthcare workers who had symptomatic COVID-19 disease proven by RT-PCR and were diagnosed at least 12 weeks ago were included in the study. Demographic characteristics, comorbidities, symptoms at time of diagnosis and symptoms that persisted more than 3 weeks were examined in detail with a conducted questionnaire. RESULTS: Of 121 patients included in the study, the mean age was 33.5 (22-59) and the mean time since participants were diagnosed with COVID-19 disease was 30.3 weeks (12.7-56.9). 92% (n=112) of the participants were followed up as outpatients. 63.6% (n=77) of our patients had symptoms lasting more than 3 weeks and the most common symptom were fatigue , loss of smell and attention deficit/concentration disorder. 19 of 77 patients (24.6%) stated that their persistent symptoms lasted longer than 24 weeks, with the most common symptoms being loss of smell. CONCLUSION: All these findings show that even in young patients with mild and moderate COVID-19 infection, post-COVID symptoms are at a rate that will affect their quality of life and health services should be planned for the rehabilitation of these patients. WHAT'S KNOWN? The initial symptoms and clinical course of COVID-19 are well known, but information about the long-term follow-up post-COVİD symptoms, especially in mild and moderate patients, is limited. WHAT'S NEW? Our study contributes to the literature on the frequency of long-term symptoms at 3 months and 6 months in most young patients with mild COVID-19.It also provides data on the situation of post-COVID syndrome in Turkey.

POST-COVID SYNDROME IN HEALTHCARE WORKERS

1-INTRODUCTION

COVID-19 disease which is caused by severe acute respiratory syndrome coronovirus-2 (SARS-CoV2) and resulted in pandemic, is a disease that can present in different clinical spectrums from asymptomatic infection to critical illness and death. According to the World Health Organization data stated in June 2021, COVID-19 disease has caused over 181 million recorded cases and over 3 million deaths worldwide (1). Aside from severe cases that result in death, the vast majority of those infected recover from the disease. Number of studies have reported that some of the patients with COVID-19 disease have persistent symptoms. This condition is named as "Post-COVID Syndrome", "Long COVID" or "Long Haul Syndrome".

WHO reported that the recovery time is approximately 2 weeks for mild cases, and 3 to 6 weeks for patients with severe or critical illness (2). However, it was later revealed that symptoms persisted for weeks or even months in some patients who were not severely or critically ill. The term "Long COVID" was first used in the Lombardy region of Italy by Dr. Elisa Perego in line with the information obtained from the follow-up of her patients. Later on, thousands of people around the world who were unable to do their daily activities

due to persistent symptoms raised awareness of the symptoms of Long-COVID on social media using the hashtag #Long-COVID (3).

There is no consensus of the definition of post-COVID syndrome yet. Greenhalgh et al. defined in their study that the symptoms persist between 3 weeks and 12 weeks as post-acute COVID and symptoms that last longer than 12 weeks as post-COVID syndrome (4). In various studies, different durations of persistent symptoms have been evaluated (5-8).

Although the initial symptoms and clinical course of COVID-19 are well known, there is limited information about the long-term health consequences of those who have recovered. Because of the new cases that still emerging around the world, it is important to understand the long-term effects of COVID-19, risk factors and predictors of persistent symptoms in order to eliminate those effects and plan health services.

There are many possible mechanisms that contribute to the pathophysiology of prolonged symptoms. Sequelae due to organ damage, different duration required for recovery of each organ system, chronic inflammation or immune response/autoantibody production, rare persistence of the virus in the body, effects of hospitalization and critical illness, post intensive care syndrome, complications due to coronavirus infection, comorbidities and drugs, psychological and social issues such as post-traumatic stress disorder are among the reasons that play a role in the development of prolonged symptoms(9).

The aim of this study is to investigate persistent symptoms of health care workers after COVID-19 disease with a questionnaire and the relationship of the persistent symptoms with demographic and clinical characteristics of the patients.

2-METHOD

A questionnaire was conducted to determine post-COVID symptoms of health workers at our hospital who were diagnosed with COVID-19 disease.

In order to evaluate the long-term effects of the COVID-19 disease, healthcare workers who had symptomatic disease proven by RT-PCR and were diagnosed at least 12 weeks ago were included in the study.

Demographic characteristics (age, sex, body mass index (BMI), occupation), comorbidities, symptoms at time of diagnosis and symptoms that persisted more than 3 weeks were examined in detail with the questionnaire. Post-COVID symptoms and their relations with the demographic characteristics were analyzed.

In addition, the effects of COVID-19 disease on participants' quality of life were investigated by evaluating the EuroQoL five-dimension five-level (EQ-5D-5L) questionnaire and the EuroQoL visual analog scale (EQ-VAS) filled by the participants themselves.

The data of our study was analyzed with IBM SPSS Statistics 23 (IBM SPSS, Turkey). Descriptive statistics stated as frequency, mean, standard deviation, minimum and maximum values. Categorical variables were analyzed with Chi-square test. Risk factors of symptoms that last more than 3 weeks were determined with logistic regression analyze. Statistical significance was determined as p values below 5%.

3-RESULTS

Of the 121 patients included in the study, 39 (32.2%) were male and 82 (62.8%) were female. The mean age was 33.5 (22-59, SD=8.23). There were 82 people (67.8%) between the ages of 18-34, 31 people (25.6%) between the ages of 35-49, and 8 people (6.6%) over the age of 50. When the chronic diseases of the participants were questioned, 80 (66.1%) had no disease, while 41 (33.9%) had a known chronic disease. Nine (7.4%) of the participants were hospitalized and 112 (92.6%) were followed up as outpatients (Table 1).

When the symptoms of the patients at the time of diagnosis were questioned, the most common symptoms were fatigue (n=95, 78.5%), joint pain (n=77, 63.6%), headache (n=72, 59.5%), loss of smell (n=60, 49.6%), loss of taste (n=57, 47.1%), sore throat (n=53, 43.8%), cough (n=52, 43%), fever (n=44, 36.4%) (Table 2).

The mean time since participants were diagnosed with COVID-19 infection was 30.3 weeks (12.7-56.9, SD=12.6 weeks). Patients were asked whether they had symptoms lasting longer than 3 weeks. 77 (63.6%) had symptoms lasting more than 3 weeks after COVID-19 infection. Fatigue (n=40, 33%), loss of smell (n=27, 22.3%), attention deficit/concentration disorder (n=25, 20.7%), dyspnea (n=24, 19.8%), myalgia (n=24, 19.8%), loss of taste (n=23, 19%), cough (n=19, 15.7%), joint pain (n=18, 14.9%), sleep disturbance (n=14, 11.6%), memory difficulties (n=13, 10.7%) were the most common symptoms (Figure 1 & Figure 2).

When patients with dyspnea for more than three weeks (n=24) rated their dyspnea, 1 (4.2%) had dyspnea at rest, 2 (8.3%) had dyspnea while dressing, and 20 (83.3%) had dyspnea on stairs. When the participants (n=40) who complained of fatigue for more than three weeks rated their fatigue complaints, 29 (72.5%) said they could carry out their daily work, 5 (12.5%) spent less than 50% of the day in bed, 3 (7.5%) stated that they spent more than 50% in bed. No participant stated that they were totally confined to bed (WHO performance score) (10).

Participants were asked about the duration of their persistent symptoms. Thirty-eight (31.4%) of 121 participants had symptoms lasting longer than 12 weeks. The most common symptoms lasting longer than 12 weeks are loss of smell (n=16, 13.2%), loss of taste (n=111, 9.1%), fatigue (n=10, 8.6%), attention deficit and concentration disorder (n=9, 7.4%), dyspnea (n=8, 6.6%), sleep disturbance (n=7, 5.7%), cough (n=5, 4.1%), chest pain (n=4, 3.3%), memory difficulties (n=4, 3.3%), headache (n=3, 2.4%), myalgia (n=3, 2.4%), joint pain (n=1, 0.8%), sputum (n=1, 0.8%), constipation (n=1, 0.8%), back pain (n=1, 0.8%).

At the time of the survey, 77 of the 121 participants were diagnosed with COVID-19 before more than 24 weeks. There were 19 participants (24.6%, 19/77) who stated that their persistent symptoms lasted longer than 24 weeks. The most common symptoms lasting more than 24 weeks are respectively loss of smell (n=9, 11.6%), loss of taste (n=5, 6.4%), dyspnea (n=5, 6.4%), headache (n=3, 3.8%), fatigue (n=2, 2.5%), cough (n=2, 2.5%), attention deficit and concentration disorder (n=2, 2.5%), memory difficulties (n=1, 1.2%), sleep disorder (n=1, 1.2%), back pain (n=1, 1.2%) (Figure 3).

Fifty-seven (69%) of the women and 20 (51.3%) of the men had symptoms lasting longer than 3 weeks. There was no statistically significant difference between women and men (p=0.051). There was no statistically significant correlation between age distribution, BMI and occupational group, and symptoms lasting longer than 3 weeks (p>0.05).

Sixteen (55.2%) smokers and 61 non-smokers (66.3%) had complaints that lasted longer than 3 weeks. No statistically significant correlation was found between smoking and persistent complaints (p=0.277).

Forty-nine (61.3%) of the participants without any chronic disease and 28 (68.3%) of the participants with a known chronic disease had symptoms lasting more than 3 weeks. There was no statistical difference between those with and without chronic disease (p=0.446).

Because of the low number of hospitalized patients (n=7), statistical difference of presence of persistent symptoms between hospitalized and outpatients could not be evaluated.

When the relationship between the symptoms in the initial period of COVID-19 infection and post-COVID syndrome was examined; the presence of complaints of dyspnea (p=0.028, r=6.514 (confidence interval: 1.22-34.729)) and fatigue (p=0.010, r:4.313 (confidence interval: 1.411-13.181)) at baseline was associated with the occurrence of complaints lasting more than 3 weeks. There was no significant relationship between the presence of other complaints and the presence of complaints lasting longer than three weeks.

When the EQ-5D-5L quality of life scale data was analyzed, 40 (33.1%) of the participants had worse health status than before (at least 1 dimension of deterioration and none of them improved), 72 (59.1%) identified their health status as the same before COVID-19 infection. The Q-VAS score decreased from 83.116 (10-100, SD=15.78) to 80.438 (25-100, SD=15.36) after COVID-19 infection. The mean change was 2.68 (SD=6.51). In studies, the smallest decrease in the Q-VAS score that constitutes clinical significance in respiratory diseases was determined to be above 7 points (11). The number of people who had a decrease of more than 7 points in the Q-VAS score of the participants was 19 (15.7%) (Table 3).

4-DISCUSSION

This is the first clinical study to our knowledge conducted in Turkey on post-COVID syndrome. In our study, 77 (63.6%) of the participants were found to have symptoms lasting longer than 3 weeks, after COVID-19 infection. In the study of Tenforde et al., 65% of the patients stated that they could not return to their normal health on the 14-21st day of the disease (6). In another study, at least 1 symptom was found in 68% and 66% of patients on the 30th and 60th days, respectively (7). In both studies, patients with mild to moderate disease were evaluated similar to our study. These results reveal that prolonged symptoms are also seen at high rates in patients with mild COVID-19 disease. However, in another study, it was revealed that these rates increased to 87% in patients with a more serious clinical picture (12).

Fatigue (63.6%), loss of smell (22.3%), attention deficit/concentration disorder (20.7%), and dyspnea (19.8%) were the most common persistent symptoms in our study. In many studies, the most common persistent symptom in mild and severe disease was fatigue (5, 12-15). In our study, it was noteworthy that complaints such as attention deficit/concentration disorder (%20.7), sleep disorder (%11.6) and memory difficulties (%10.7) were among the common prolonged symptoms.

While it was observed that in 31% of the participants, symptoms lasted longer than 12 weeks, it was found that the symptoms lasted longer than 24 weeks in 24% of the 77 participants who were at least 24 weeks after the diagnosis of COVID-19. In the study of Perez et al., post-COVID symptoms were detected in 50.9% of the patients on day 77. In this study, when the frequency of post-COVID symptoms was evaluated separately according to severity of the disease, it was reported as 36% in patients with mild pneumonia and 58% in patients with severe pneumonia (8). According to another study, 80.4% of the hospitalized patients had ongoing symptoms at the 7th month of follow-up (16). In another study, 58% of the patients evaluated on an average of 217 days after discharge had at least one ongoing symptom (17). In the study of Huang et al., 76% of the patients had ongoing symptoms on the 186th day (18). Our study contributes to the literature about the frequency of symptoms lasting longer than 6 months in the long-term follow-up of outpatients.

Fatigue and dyspnea were the most common symptoms lasting longer than 12 weeks in the hospitalized patient studies, in our study; the most common symptoms lasting longer than 12 weeks were loss of smell (13%), loss of taste (9%), fatigue (8%), attention deficit and concentration disorder (7%) (8, 19). When the symptoms lasting longer than 24 weeks were evaluated in our study, the most common symptoms were loss of smell (11%) and loss of taste (6%). In the study of Vanichkachorn et al., the most common symptoms at 6 months were fatigue (80%) and shortness of breath (49%) (20). In a study in which patients followed for 30-300 days (mean 169 days) were evaluated, loss of smell and taste was reported at a rate of 13.6%, similar to our study. However, fatigue (13.6%) was reported higher in this study than in our study (2.5%) (21).

We could not find a significant correlation between gender, age, BMI, the presence of comorbidities and the presence of post-COVID symptoms. This may be related to the fact that the participants were young patients, did not have severe comorbidities, and the majority (92%) consisted of mild outpatients. In a study similar to our study no significant correlation was found between the clinical characteristics of the patients, gender, age, comorbidities, severity of acute infection, intensive care unit (ICU) stay and length of stay in the hospital or ICU, and post-COVID symptoms (8). In another multicenter study, it was reported that there was a significant relationship between female gender, length of hospital stays, number of comorbidities, and number of acute COVID-19 symptoms and post-COVID symptoms (16). These different results obtained from various studies reveal that there is a need for more comprehensive studies with larger series on this subject.

When we examined the relationship between post-COVID symptoms and smoking, 55% of smokers and 66% of non-smokers had complaints that lasted longer than 3 weeks. There was no statistically significant relationship between smoking and persistent complaints. When we reviewed the literature, no other study was found that examined the relationship between smoking and post-COVID syndrome.

In our study, it was determined that the complaints of dyspnea and fatigue in the initial period of COVID-19 infection were associated with persistent symptoms. In one study, it was determined that the number of

symptoms in the first week of the disease constitutes a risk factor for post-COVID syndrome (22).

In our study, 72% of the patients with fatigue lasting longer than 3 weeks stated that they were able to carry out their daily activities, while 83% of the patients who described dyspnea defined it as dyspnea that increased with climbing stairs. In studies conducted with severe disease, it was found that complaints of fatigue and shortness of breath prevented patients from performing their daily work (5, 19). When outpatients were evaluated in our study, it was found that although these complaints were among the most common persistent symptoms, they did not prevent the patients from doing their daily activities.

While 33% of our participants defined their health status as worse than before according to the EQ-5D-5L scale, it was determined that 15% had a decrease of 7 points or more in their EQ-VAS score (11). It has been reported in some studies that the quality of life of patients with severe COVID-19 disease was affected by COVID-19 infection, and a decrease in the Q-VAS score to a clinical significance was observed (5, 19). The results of our study showed that the quality of life was significantly affected in patients with mild to moderate COVID-19 disease.

There are some limitations of our study; it was carried out in a single center and the sample size was relatively small, most of the patients were outpatients and because of that our cohort was not reflect all COVID-19 patients.

In conclusion, all these findings show that even in young patients with mild and moderate COVID-19 infection, long-term post-COVID symptoms are at a rate that will affect their quality of life and health services should be planned for the rehabilitation of these patients.

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