Short Reports

Persistence of symptoms after Covid-19 infection in Kerala

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ABSTRACT

Background. Persistence of symptoms following Covid-19 infection has now been recognized as an upcoming public health crisis. Understanding these persistent symptoms and quantifying them is vital in planning care for these patients. Studies from India estimating the magnitude of these persistent symptoms are scarce. We aimed to estimate the proportion of symptoms that persist among patients who have recovered from Covid-19 infection.

Methods. We conducted this descriptive study among 114 individuals after they recovered from Covid-19 infection. Participants diagnosed as Covid-positive at a tertiary care centre were included in the study. Data were collected from the participants through an online platform. Frequency and proportion of various persistent symptoms were estimated. Analysis was done using SPSS version 16.

Results. The mean (SD) age of the study participants was 35.5 (15.7) years. Women comprised 62.3% ($n=71$) of the population. Persistent symptoms were reported by 66 (57.9%; 95% CI 53.07–62.72) participants. The most common symptoms reported were fatigue ($n=45$, 39.5%) and joint pain ($n=23$, 20.2%). Those who required hospitalization for longer duration were found to be more associated with having persistent symptoms ($p=0.018$).

Conclusion. A sizable proportion of individuals had persistent symptoms after recovering from Covid-19 infection. Health facilities should be equipped to address these emerging issues.

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INTRODUCTION

The symptomatology of SARS-CoV-2 infection has been well-documented. The natural disease manifestation can range from asymptomatic cases to severe acute respiratory failure. Fever, fatigue, cough and expectoration are the most common clinical presentations.[1,2] The persistence of symptoms among those who have recovered from acute Covid infection is being reported worldwide. This sequelae of Covid-19 infection now referred to as 'long Covid' is being recognized as an emerging public health problem.[3] Studies from developed countries reveal the persistence of symptoms beyond 60 days among 87% of the subjects who were infected.[4] The data on persistent symptoms are lacking from low- and middle-income countries.

Kerala was the first state in India to report Covid-19 infection in a medical student who returned from Wuhan, China on 30 January 2020. The pandemic had affected 2 263 959 individuals till 20 May 2021 in Kerala as indicated by the figures from the Directorate of Health Services, Government of Kerala.[5] Considering the figures from developed nations, it is expected that a sizable number of individuals in Kerala would be suffering from long-term effects of Covid infection. Currently, the data on persistent symptoms after Covid infection are not available in India. It is important to know the various symptoms and their prevalence for improving health system preparedness. We aimed to study persistent symptoms and their prevalence among individuals who had recovered from Covid-19 infection.

METHODS

This study was conducted at the Sree Uthradom Thirunal Academy of Medical Sciences (SUTAMS), a tertiary care centre located at Vattappara, Thiruvananthapuram, Kerala from December 2020 to April 2021 after approval from the institution's ethics committee. Individuals aged 18 years and above, diagnosed with Covid-19 infection at SUTAMS were invited to participate in the study, at least 1 month after they tested negative. We included subjects who were reverse transcriptase polymerase chain reaction (RT-PCR)-positive from December 2020 onwards. Additional subjects were identified through a snowballing sampling technique. The participants were contacted through telephone and the details of the study were explained. The informed consent form was sent to them via an online platform and willingness to participate in the study was obtained.

Carfì *et al.* reported that 53% of Covid-19 patients had persistent chronic fatigue after testing negative.[4] Considering the prevalence of persistent symptoms as 53%, for a power of 80% and absolute precision of 10, the required sample size was 95. To this figure, a non-response rate of 15% was added and the total sample size required was calculated as 110.

The major outcome variable of interest was persistent symptoms following Covid-19 infection, which was defined as the presence of symptoms of Covid-19 infection in an individual even after testing negative. The frequency and proportion of various persistent symptoms and their duration were estimated. Non-parametric tests such as Mann–Whitney U test were applied to assess the association between median days of hospitalization and persistence of symptoms. SPSS version 16 was used for data analysis.

RESULTS

We sent invitations for participation via an online platform to

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120 patients who had recovered from Covid-19. All except 6 patients expressed willingness and were included in the study. The mean (SD) age of the study population was 35.5 (15.7) years (Table I). The majority of patients were symptomatic (*n*=97, 85.1%). Fatigue (*n*=67, 69.1%), fever (*n*=63, 64.9%) and sore throat (*n*=46, 47.4%) were the most common symptoms reported during the acute phase of the illness. Acute symptoms lasted for a median (interquartile range [IQR]) of 7 (2–14) days. Nearly one-fourth (*n*=24, 21.1%) of the participants experienced more than five symptoms at the time of infection. Almost one-third of the patients (*n*=34, 29.8%) required hospital admission. The median (IQR) duration of stay in the hospital was 3 (2–11) days. The maximum duration of hospital stay was 18 days.

Symptoms were persisting in 66 (57.9%; CI 53.07–62.72) patients even after testing negative for Covid-19. The mean (SD) age of those with persisting symptoms was 36.7 (13.4) years. Thirty-nine (59.1%) of them were women. The most commonly reported symptom was fatigue (*n*=45, 39.5%), followed by joint pain (*n*=23, 20.2%) and shortness of breath (*n*=22, 19.3%, Table II). The median (IQR) duration of persistence of these symptoms was 21 days (2–60) after they tested negative for Covid-19 infection. The symptoms persisted beyond 28 days for 42.4% (*n*=28) individuals and more than 12 weeks for 13.6% (*n*=9; Table III). Fatigue, joint pain, shortness of breath and loss of smell and taste were the major symptoms that continued to persist. The maximum duration reported with persistence of the symptoms was 210 days.

There was a statistically significant association between hospital admission for Covid treatment and persistence of symptoms after testing negative. The median (IQR) number of days of hospital admissions among those with persistent symptoms was 10 (2–11) days compared to 2 (1–3) days among those without (p=0.018) persistent symptoms. Among the 6 patients who required oxygen support during the treatment of Covid, 4 had symptoms persisting even after testing negative. The symptoms were seen to persist for a longer duration among those with comorbid conditions compared to those without, though this difference was not statistically significant. Among those who had more than 5 symptoms at the time of infection, 75% (*n*=18) had persistence of symptoms (p=0.05). This association between the increased number of symptoms and persistence of symptoms was statistically significant.

TABLE I. Baseline characteristics of the study population

Variable	Frequency (%)
Age (years)	
18–30	56 (49.1)
31–45	27 (23.7)
46–60	24 (21.1)
61–80	6 (5.3)
>80	1 (0.9)
Gender	
Women	71 (62.3)
Socioeconomic status	
Lower	8 (7.1)
Education (years)	
Primary (up to class 8)	1 (0.9)
High school (up to class 10)	8 (7)
Higher secondary (up to class 12)	11 (10.3)
Graduation	54 (50.5)
Postgraduation	33 (30.8)

TABLE II. Frequency and proportion of various persistent symptoms of Covid-19 among the study participants

Persistent symptom	Frequency (%)
Fatigue	45 (39.5)
Joint pain	23 (20.2)
Shortness of breath	22 (19.3)
Loss of smell	19 (16.7)
Cough	16 (14)
Loss of taste	15 (13.2)
Headache	13 (11.4)
Sleep disturbances	12 (10.5)
Cognitive disturbances	11 (9.6)
Myalgia	10 (8.8)
Chest pain	6 (5.3)
Gastrointestinal disturbances	4 (3.5)
Others	12 (10.5)

TABLE III. Frequency and proportion of symptoms which persisted beyond 28 days and 12 weeks among the study participants

Symptom	Beyond 28 days (*n*=28), *n* (%)	Beyond 12 weeks (*n*=9), *n* (%)
Fatigue	21 (75)	6 (66.7)
Joint pain	14 (50)	5 (55.6)
Shortness of breath	10 (35.7)	3 (33.3)
Loss of smell	7 (25)	3 (33.3)
Loss of taste	7 (25)	3 (33.3)
Headache	6 (21.4)	1 (11.1)
Cough	5 (17.9)	1 (11.1)

DISCUSSION

We found persistence of symptoms among 57.9% of patients who recovered from Covid-19 infection. The most common symptoms which persisted were fatigue, joint pain and shortness of breath. The symptomatology of persistent symptoms reported by other authors is similar to our findings.[4,6–8] However, some of these studies report a higher proportion of patients with persistent symptoms as the studies included only patients who were discharged from hospital. A study by Tomar *et al*. on patients discharged from a Covid treatment care facility found symptoms persisting in as high as 82%.[9] Our study included those who were in home isolation as well as those admitted to Covid care centres. Nearly two-thirds of our patients experienced only mild symptoms and were in home isolation. The lower percentage of 57.9% reported by us could be because of inclusion of patients with mild or moderate disease. We found that more severe cases that required hospitalization were more likely to have persistent symptoms.

Long Covid or post-acute sequelae of Covid as an entity was recognized recently and there are many challenges in defining the duration of persistence of symptoms to be characterized as long Covid.[8,10] Persistence of clinical symptoms and long Covid is now recognized as an upcoming multisystem condition.[11] Although there is no consensus, long Covid syndrome has been considered as the phenomenon of persistence of symptoms of Covid-19 beyond 12 weeks.[10,12] The period between 4 and 12 weeks has been considered as acute post-Covid phase. In our study, 28 patients (42.4%) had symptoms beyond 28 days. Further, 9 (13.6%) had symptoms

persisting for 12 weeks and beyond. This proportion is high compared to 2.3% reported by Sudre *et al*. from the UK.[13] The differences in the management of Covid-19, the various strains of the virus and differences among the affected population could be the possible reasons for regional variations. Similar to Sudre *et al*.,[13] we found a significant association between those who had more than five symptoms during the active phase of illness and persistence of symptoms. Female sex and comorbid conditions such as hypertension and diabetes have been reported as predictors of persistent symptoms.[8,14,15] We too found that women and those with comorbid conditions had a higher frequency of persistence of symptoms than others. The smaller number of patients included could be a reason for obtaining a statistically significant difference. Another limitation of our study is the non-random method of sampling of participants. The baseline characteristics of our study population may not be representative of the reference population of India. This could be the reason for not finding an association with older age and persistence of symptoms, as our study population consisted of more younger individuals. Despite these limitations, our study provides the likely impact of long-term sequelae of Covid-19 in Kerala and probably India.

Conflicts of interest. None declared

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