

Long COVID disease among symptomatic and asymptomatic COVID-19 patients: A multi-centric descriptive study

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Abstract

Introduction: According to WHO, 3 months from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis is considered as post COVID-19 syndrome or long COVID.

Objective: Objective of this study was to evaluate the prevalence various symptoms in post COVID syndrome/long COVID cases within 3 months from the recovery or infection.

Methods: This multicentric hospital based cross sectional study was done among 113 Long COVID cases of 567 previously infected COVID-19 subjects at COVID clinics in Telangana (Hyderabad, Nalgonda) and Madya Pradesh (Indore), India for 1 year during January to December 2021. Data was entered into Microsoft excel and results were displayed by numbers and frequencies only.

Results: Among long COVID study population the mean age was 43 years, with male predominance (57.5%) and more than half of subjects were having co-morbidities, hypertension being the commonest (35.4%). Majority had moderate illness (40.7%) managed at home (60.2%) initially. Fatigue (67.3%), body pains (38.1%) and shortness of breath (29.2%) were common post COVID symptoms.

Conclusion: Present study found that, increasing age, co-morbidities and initial severity of the disease are found to be risk factors for post COVID complications.

Keywords: COVID-19, post-acute COVID-19 syndrome, long COVID

Introduction

In the long course of human history, we are at a continuous battle with contagious diseases. In the present century itself, we have witnessed three major epidemics caused by Corona viruses. They are SARS-CoV-2003, MERS CoV 2012 and coronavirus disease (COVID 19) in 2019. The fight in between humans and viruses is destined to continue^[1]. The origin and the source of SARS-CoV-2, the earliest instances of snags, birds and other animals, such as bats, were connected with the Huanan South-China seafood market^[2].

On March 11, 2020, the World Health Organization (WHO) designated Coronavirus Disease 2019 (COVID-19) to be a pandemic, largely owing to the pace and magnitude of disease spread^[3]. The outbreak began in mainland China and was recorded in the town of Wuhan, Hubei Province on 26th February for the first time^[4].

Although most patients with COVID-19 improve in weeks of disease others suffer from post-COVID problems. Post-COVID is a widespread spectrum of new, returning or continuing health issues. Asymptomatic COVID patients had suffered post COVID health issues which may be attributed to the disease or by chance. These diseases can have wide spectrum and multi-organ involvement irrespective of duration of disease or suffering, hence post COVID symptoms also known as long COVID disease^[5]. Studies related to post COVID symptoms are scarce and most of the available data belong to the ICU recovered patients while few of them were asymptomatic. The study was conducted with the purpose to understand the consequences caused by COVID-19 in previously positive cases in post recovery phase.

Objectives

The study aimed at knowing the various health related consequences in post COVID cases within 1 year from the recovery of infection.

Materials and Methods

Study area: This multicentric hospital based, cross sectional study was done at Covid clinics in Telangana (Hyderabad, Nalgonda) and Madya Pradesh (Indore), India.

Study population: A total 113 long COVID cases of 567 previously infected COVID-19 subjects were considered for this study who were attending COVID clinics.

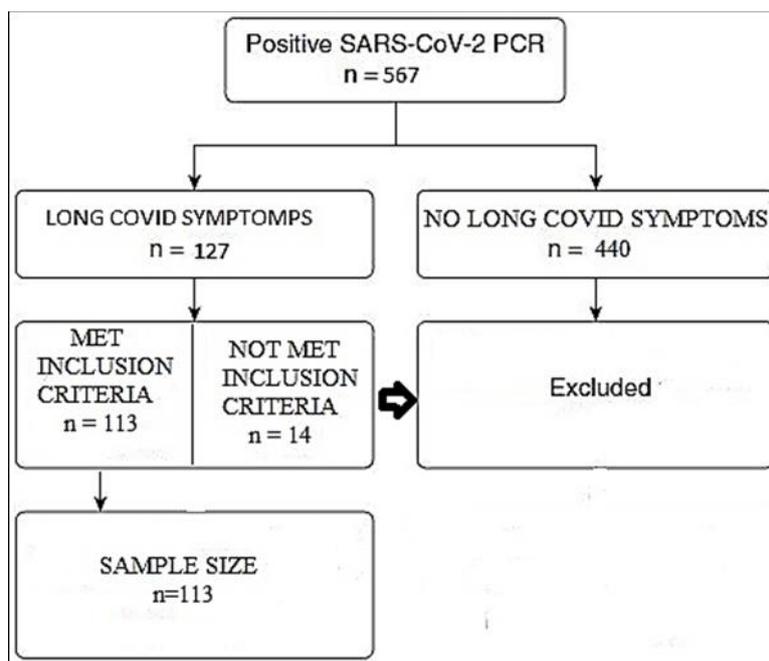
Study period: This study was conducted between the months of January 2021 to December 2021 (for period of 1 year).

Inclusion criteria

1. Individuals within one year from the onset of COVID-19 with symptoms and that last for at least 2 months and cannot be explained by an alternative diagnosis (WHO criteria)^[6] irrespective of severity.
2. Those who were willing to participate were included in the study.
3. Those who had a previous record of covid positivity or treatment taken.

Sample size: Sample size, was calculated by OpenEpi using the incidence of 10% reported by Pavli A *et al.*^[7] which gave a minimum sample size of 98 (confidence level 90%, absolute precision 5%). Present study sample size is 113 (Hyderabad 45, Nalgonda 31 and Indore 37).

Sampling method: All the cases that met the above inclusion criteria and presented to the COVID-19 OPD during study period were included.



Study design: All the cases those who met the inclusion criteria were explained about the study and its outcomes. After obtaining consent from the study population, a pre-tested pre-structured questionnaire was applied. The questionnaire was applied in English and local language.

Statistical analysis: Data was entered into Microsoft excel, and further analysis done by IBM SPSS V21. Results were displayed by numbers and frequencies only.

Results

Table 1: Characteristics of Study Population

Variables		No. (N=113)	Percentage
Age (Mean 43 ± 14)	18-20 yrs	07	6.2%
	21-30 yrs	19	16.8%
	31-40 yrs	24	21.2%
	41-50 yrs	28	24.8%
	51-60 yrs	21	18.6%
	>61 yrs	14	12.4%
Gender	Female	48	42.5%
	Male	65	57.5%
Co-morbidities		57	50.4%
Hypertension		40	35.4%
Diabetes		17	15.0%
Active Smoking		15	13.3%
Chronic Respiratory Disease		12	10.6%
CKD		05	4.4%
Obesity		32	28.3%

As seen from Table 1 that, in the present study majority of study population were between 41 and 60 years, with a slight male predominance. More than half of the subjects were having co-morbidities, hypertension was the most common followed by obesity.

Table 2: Symptoms and Treatment of Study Population

Variables		No. (N=113)	Percentage
Initial Symptoms	Asymptomatic	08	7.1%
	Critical Illness	09	8.0%
	Mild Illness	27	23.9%
	Moderate Illness	46	40.7%
	Severe Illness	23	20.4%
Managed at	Home	68	60.2%
	ICU	18	15.9%
	Non- ICU	27	23.9%
Oxygen Therapy		43	38.1%
On Steroids		38	33.6%

It was observed from Table 2 that, majority suffered with moderate illness during the course of the disease (40%), and were managed at home while majority were managed at home (60%).

Table 3: Characterization of Post-Covid-19 Manifestations

Characterization of Post-Covid-19 Manifestations	No. (N=113)	Percentage
Tiredness Lack of Energy(Fatigue)	76	67.3%
Body Pain/Joint Pain	43	38.1%
Shortness of Breath	33	29.2%
Persistence of Cough	24	21.2%
Depression	23	20.4%
Fever (Intermittent)	22	19.5%
Continuous Headache	20	17.7%
Maculopapular Rash	19	16.8%
Tinnitus	19	16.8%
Palpitations/Tachycardia	17	15.0%
Re Admitted	16	14.2%
Ortho Static Hypotension	13	11.5%
Secondary Bacterial Lung Infection-Pneumonia	13	11.5%
Worsening of DM	10	8.8%
Brain Fog	10	8.8%
Loss of Taste or Smell	08	7.1%
Avascular Necrosis of Hip	02	1.8%

As seen from Table 3 that, among post-COVID-19 manifestations, fatigue (67%) was most common followed by body pains/joint pains (38.1%), shortness of breath (29%).

Discussion

Among 567 previously infected COVID-19 cases, 113 cases (19.9%) were having Long COVID symptoms. In present study, majority long COVID subjects were in their in middle age with mean of 43 years and had Co-morbidities. The risk of developing long COVID was also found to be increased along a gradient of decreasing age. Hypertension was the most common comorbidity in present study (n=40 [35.4%]) which is consistent with many studies^[8, 9]. Co-morbidities appears to be playing role in both initial infection and long COVID. Co-morbidities role in pathogenesis Long COVID, needs to be explored.

Severity of the disease was categorized according to the 'National Institutes of Health' based

on the initial symptoms^[10]. There were only 8 (7.1%) previously asymptomatic cases (COVID-19 positive) with long COVID symptoms. The majority suffered from mild to moderate COVID-19 disease which denotes the importance of the initial severity role in the development of long COVID. There was a correlation between the prevalence of post-COVID symptoms with initial disease severity, that is severe COVID subjects had higher post-COVID manifestations. This association was supported by Mahmud R *et al.*^[11] study where 87% of the long COVID had mild to moderate COVID-19 disease initially. Study population who were on oxygen therapy (n=43, 38%) or steroid therapy (n=38, 33.6%) were more prone to get long COVID according to present study. The most common post-COVID manifestations were fatigue, cough, respiratory distress, and headache among various studies^[12-14]. In the present study Fatigue, body aches, exertional dyspnoea, persistence of cough, and depression were seen in 67.3%, 38.1%, 29.2%, 21.2% and 12% of the patients, respectively which is similar to the above studies. The cause of fatigue's predominance remained mostly unknown^[15]. Fatigue may be caused by immune system changes caused by viral infections. Coughing and shortness of breath can be explained by persistent chronic lung damage^[15, 16].

Surprisingly Depression was also seen in many (n=23, 20.4%), for which reasons have to be evaluated. According wang Set al^[17] psychological distress may be a risk factor rather than sequel for post-COVID-19 conditions in individuals with SARS-CoV-2 infection Among 2 cases of avascular necrosis of the femur, only one had a history of steroid treatment which leaves unknown etiology behind another case. According to present study secondary bacterial infection was not uncommon (n=13, 11.5%). As it is a potentially fatal complication physicians treating Long COVID have to be very careful about the same in order to decrease the mortality. Shafran N *et al.*^[18] stated, Secondary bacterial infection is a significant complication linked with worse results in COVID-19 patients compared to influenza patients therefore Careful monitoring and quick antibiotic therapy may assist some individuals.

Quality of life and health status are impacted by qualitative olfactory (smell) dysfunctions, which are a prevalent consequence of any post-viral illness. Eight cases (7.1%) had this symptom in present study. In the US adult population, recent epidemiological research^[19] found a prevalence of 13.5% for smell impairment, 17.3% for taste impairment, and 2.2% for combined taste and smell impairment, which supports presents study findings. Brain fogging, orthostatic hypertension and worsening of diabetes was also seen as a post COVID complication in present study.

Limitation

Blood parameters, lung, abdomen examinations were not evaluated. Vaccination status was also not taken into consideration. Results can be generalized to the region but not to the whole country, as prevalence during the outbreak was difficult to calculate hence correct sample size cannot be met with.

Conclusion

It can be noted that a person who had COVID might have post COVID complications even after months. The risk factors for post COVID complications are increasing age & comorbidities. Larger population studies are required to quantify the complications and also assess if vaccination reduces the chances of complications.

Conflict of interest: There was no conflict of interest.

External funding: No external funding was involved in this study.

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