

# A STUDY ON PERSISTENT SYMPTOMS IN PATIENTS WHO WERE DISCHARGED FROM A DEDICATED COVID HOSPITAL INTENSIVE CARE UNIT (ICU)

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## Abstract

**Introduction:** A significant proportion of patients who had COVID-19 have experienced symptoms persisting even weeks after recovery from the acute phase of infection. For some patients the symptoms were mild but few have experienced moderate to severe symptoms hampering their daily routine. Studies to know the long term effects of COVID-19 are needed to effectively plan healthcare delivery.

**Aim:** To know the persistent symptoms in patients who were discharged from a dedicated COVID hospital's intensive care unit (ICU).

**Materials and Methods:** In this cohort study four hundred and forty six patients with laboratory confirmed COVID 19, who were treated and discharged from intensive care unit (ICU) between April 2019 to Nov 2019 were included. The telephonic survey was done four times in three months after being discharged. First follow up was on the 15<sup>th</sup> day of discharge, second on the first month of discharge, third follow up on the second month of discharge and the fourth at the end of third month. Patients were asked to retrospectively recollect the symptoms which were present during the acute phase of the disease and if those symptoms or any new symptoms are present now.

**Results:** Tiredness (fatigue), dyspnea, cough and chest pain were the common symptoms observed. Among 446 patients followed up, 37.4% had no symptoms at the first follow up and 87% were symptom free by the end of third month. 26.09% complained of tiredness at the 15<sup>th</sup> day of discharge, but only 4.4% of them complained of this symptom at the end of third month. Dyspnea was seen in 21.5% of patients in the first follow up and by the end of third month none of them had dyspnea. There was a gradual decline in number of patients having cough from 19.5% in the first follow up to 0.24% in the last follow up. Chest pain was seen in 7% of the patients on the 15<sup>th</sup> day of discharge and was seen only in 0.24% of them at the end of third month. Out of 446 patients followed up for a period of three months we observed a mortality of 6.27%.

**Conclusion:** Patients experience persistent symptoms even after recovering from COVID 19 infection and getting discharged from intensive care unit. There is a need for follow up and assessment of discharged patients to know to what extent these symptoms have affected them physically and mentally.

**Keywords:** COVID 19, tiredness, dyspnea, chest pain

## Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2) is the pathogen causing coronavirus disease 2019 (COVID 19) pandemic [1]. Initial days of pandemic was spent in understanding and treating the acute symptoms. COVID-19 is known to involve multi-organs with a broad spectrum of presentations, and there are reports of these symptoms being persistent for several months after the initial infection. COVID 19 survivors have suffered from symptoms long after recovery, no matter how mild or severe the initial infection was.

A comprehensive approach to the patient which extends beyond the acute phase of the disease is necessary. Notion that patients surviving intensive care and mechanical ventilation for several weeks can be discharged home without further medical attention became a dangerous illusion. Post discharge care of patients who continue to display debilitating symptoms weeks and months after initial COVID 19 is the need of the hour. The aim of this study was to know the persistent symptoms experienced by people who were admitted and discharged from dedicated Covid hospital ICU, Hassan, Karnataka.

## Materials and methods

This retrospective cohort study was conducted in a dedicated Covid hospital ICU, Hassan, Karnataka. Four hundred and forty six patients with laboratory confirmed COVID 19, who were treated and discharged from ICU between April 2019 to Nov 2019 were included in this study. Clearance from Institutional Ethical Committee was taken. Baseline demographic data included gender, age, comorbidities which was collected from hospital ICU data. Patients who were not willing to participate in the study were excluded.

Participants were interviewed on specific symptoms which potentially correlated with COVID 19 symptoms using a standardized questionnaire. Patients were asked to retrospectively recollect the symptoms which were present during the acute phase of the disease and if each symptom persisted now. A telephonic survey was done four times over a period of three months after being discharged. First interview on the fifteenth day of discharge, second interview at first month of discharge, the third interview at the end of second month of discharge and fourth interview at the end of third month of discharge.

They were questioned for

1. Tiredness/fatigue
2. Dyspnea
3. Cough
4. Chest pain
5. Others

Dyspnea was graded using the MMRC scale and chest pain was graded using NYHA classification.

### Breathlessness Scale (MMRC dyspnea scale)

Grade	Degree of Dyspnea
0	No dyspnea except with strenuous exercise
1	Dyspnea when walking up an incline or hurrying on the level
2	Walks slower than most on the level, or stops after 15 minutes of walking on the level
3	Stops after a few minutes of walking on the level
4	With minimal activity such as getting dressed too dyspneic to leave the house

### NYHA classification of chest pain

Class	
1	No limitations of physical activity (ordinary physical activity does not cause symptoms)
2	Slight limitation of physical activity (ordinary physical activity does cause symptoms)
3	Moderate limitation of physical activity (patient is comfortable at rest but less than ordinary activities causing symptoms)
4	Unable to perform any physical activity without discomfort, therefore severe limitation (patient may be symptomatic even at rest)

### Statistical analysis

Data was entered into Microsoft excel data sheet and was analysed using SPSS 22 version software. Categorical data was represented in the form of frequencies and proportion. Continuous data was represented as mean and standard deviation, independent T test was used a test of significance to identify the mean difference between two quantitative variables.

Statistical software: MS excel, SPSS version 22 (IBM SPSS statistics, Somers NY USA) was used to analyse data.

### Results

The study population included 446 discharged patients. (In case of death of patients their relatives were contacted). In the study 71.1% were male patients and 28.9% were female patients (Figure 1). Majority of our patients were in the age group between 21 to 80 years. Among them 109 patients were in the age of 41-50 years, 98 participants were in the age group of 51-60 years, 82 patients were 61-70 years of age group (Figure 2). Among the 446 participants, 249 of them had either one or more than one co morbidity. 39.2% had Diabetes mellitus, 37.4% had hypertension, 1.8% had a history of IHD, 7% had COPD and 1.6% were with chronic renal disease (Table 1).

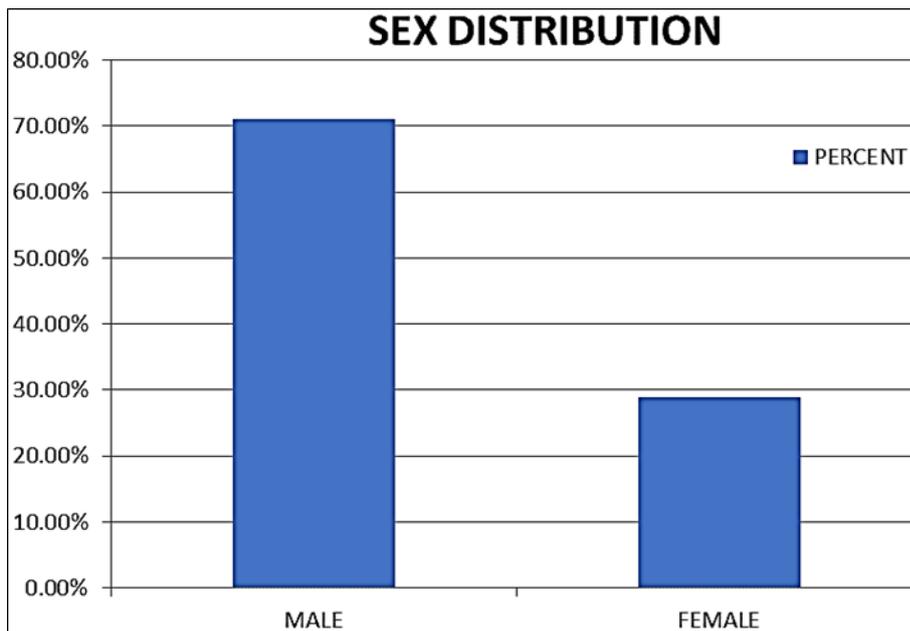


Fig 1: Sex distribution of patients

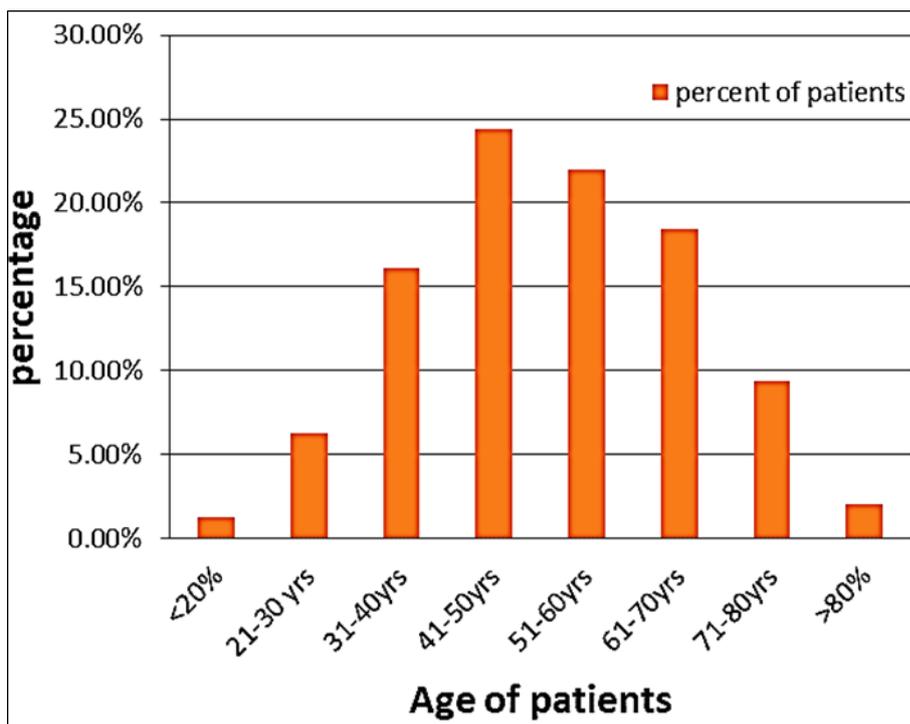


Fig 2: Age distribution of patient

Table 1: Comorbidities distribution

Comorbidities	No of Patients	Percent
No Co morbidities	197	44.2%
Diabetes Mellitus	175	39.2%
Hypertension	167	37.4%
COPD/Bronchial Asthma	31	7%
Renal disease	7	1.6%
IHD	8	1.8%

Tiredness/easy fatigability, dyspnea, cough, chest pain were the most common symptoms we observed in our follow up patients. There was a gradual decline in the number of patients who experienced these symptoms over the period of our follow up of three months. The most common persistent complaint was tiredness or easy fatigability which was seen in 26.09% of patients at the end of 15<sup>th</sup> day of discharge and 4.4% of them still had tiredness by the end of third month. Dyspnea was the next common symptom we observed. At fifteenth day of discharge 21.5% of the subjects had dyspnea, at the end of one month 8.7% of patients, at the end of second month 1.2% of patients, and at the end of third month none of them had this symptom. Cough was the third common symptom experienced during post Covid period. 19.5%, 13.88% and 2.16% of patients had cough at the end of 15<sup>th</sup> day, one month, two months of discharge respectively. Only 0.24 % of them had cough by the end of third month (Table 4). 87% of patients were symptom free at the end of 3<sup>rd</sup> month compared to only 37.4% of patients having no symptoms by the end of 15<sup>th</sup> day of discharge.

Among the 96 patients who had dyspnea, the severity was measured using Mmrc dyspnea scale. 45 patients had dyspnea for strenuous exercise (Grade 0), and four of them had dyspnea for walking on flat plane in the first follow up (Grade 2). There was a gradual decrease in the severity of dyspnea experienced in the further follow ups (Table 2).

Among the 31 patients who had chest pain on the first follow up, 20 patients had grade 1 and 11 of them had grade 2 chest pain. By the end of 3<sup>rd</sup> month only one patient had grade 2 chest pain. (Table 3). In the study the mortality rate was 6.27% (28 patients). Out of 28 patients 11 had died by 15<sup>th</sup> day of discharge, 9 patients had died between 16 to 30 days, 5 patients had died between first and second month follow up and three patients had died between second and third month of follow up (Table 4).

## Discussion

In spite of initial recovery from critical illness, many patients continue to have symptoms or even deteriorate after discharge from the Intensive Care Unit. The nature and prevalence of such symptoms need to be addressed as there is emerging evidence for it. Few studies were done in China and Italy to know about the post discharge symptoms of COVID. The present study gives an insight to the symptoms persisting in patients after discharge from COVID ICU. In our study only a small proportion (37.4%) of discharged patients were free of symptoms on the first follow up and 95% of the discharged were symptom free at three months after discharge. Among the patients who had persistent symptoms, commonly experienced symptoms were tiredness, cough, dyspnea and chest pain.

A multihospital cohort study from 38 hospitals in Michigan was conducted to know the outcome of discharged patients at 60<sup>th</sup> day. Out of 488 patients who completed the telephonic survey, 32.6% of them reported persistent symptoms. Dyspnea while walking up the stairs in 22.9%, cough in 15.4% and loss of taste and smell in 13.1% was observed.<sup>[2]</sup> Similar studies by Angelo Carfiet al.<sup>[3]</sup> and a group of doctors from Italy reported 87.4% of patients among 143 to be having persistence of symptoms at a mean follow up of 60 days from the onset of first symptom. Fatigue (53.1%), dyspnea (43.4%), chest pain (21.7%) was reported. Our study supported the observations of the earlier studies which showed high incidence of fatigue and dyspnea among the discharged patients.

**Table 2:** Number of patients who had dyspnea and the severity grading at various intervals

Follow up intervals	No of Patients	Grade 0	Grade 1	Grade 2	Grade3	Grade 4
15 days	96	45(46.8%)	47(48.96%)	4(4.16%)	-	-
1 month	37	28(75.6%)	7 (18.92%)	2(5.4%)	-	-
2 month	5	2(40%)	3(60%)	-	-	-
3 month	0	-	-	-	-	-

Among our 446 patients who were followed up, 62.6% of patients reported of at least one persistent symptom at the fifteenth day of discharge. The most common reported symptom was tiredness which was seen in 26% of people on the fifteenth day and it was prevalent in only 4.4% of them by the end of third month. High prevalence of fatigue seen in our study is consistent with the study done by Huang C et al., who in their six months follow up study found out that survivors were mainly troubled with fatigue or muscle weakness among all other symptoms<sup>[4]</sup>.

Other most common symptom dyspnea and cough in our study population had a prevalence of 21.5% and 19.5% respectively at 15 day follow up and a prevalence of 0% and 0.24% respectively at third month follow up. Persistence of fibrotic residual pulmonary area, a reduction in diffusion capacity, lower respiratory muscle strength are the most common reported physiologic impairment in post COVID 19, with decrement directly related to severity of acute illness.<sup>[5]</sup> Two of our participants still required supplementary oxygen at home at third month follow up. We observed a gradual decrease of the symptomatic patients over a period of three months and also there was a gradual improvement in the severity of symptoms over months.

On our 15<sup>th</sup> day follow up 7% of people had chest pain, whereas by the end of third month only 0.24% of patients had chest pain. Recovered patients may have increased cardiometabolic demand associated with reduced cardiac reserve, dysregulation of renin-angiotensin-aldosterone system [6]. Myocardial scarring or fibrosis and cardiomyopathy can lead to re-entrant arrhythmias [7]. Study done by Daniel Ayoubkhaniet al. also showed individuals discharged from hospital have higher rate of multi organ dysfunction compared with the risk in general population [8]. Apart from these common symptoms, we observed symptoms like gastrointestinal disturbances (diarrhoea, decreased appetite) and sleep disturbances.

**Table 3:** Number of patients who had chest pain and the severity grading at various intervals

Follow up intervals	Number of patients	Grade 1	Grade 2	Grade 3	Grade 4
15days	31	20(64.51%)	11(35.48%)	-	-
1month	8	8 (100%)	-	-	-
2month	1	1	-	-	-
3month	1	-	1	-	-

In this three month follow-up, we observed a mortality of 6.27%. A study done by Donnelly JP et al. [9] had a mortality rate of 9% within 60 day of discharge. The readmission rate was 4.24% in our study period of three months. The most common reason for readmission within 15 days of discharge was dyspnea. We found that re-admissions were more in people with co-morbidities and among older adults. Studies done by Atalla E et al. [10] have concluded that readmission within 12 days of discharge were more likely to be associated with COVID 19, while those happening later were related to other reasons.

The limitation of our study was that we relied on patients self-recall and may have been subject to incomplete recall or recall bias. The presence of comorbidities may have impacted self-reported symptoms. Physical examination during follow up would have been more appropriate but due to ongoing pandemic, calling the patient to hospital during follow up was ruled out. Electronic mail could not be implemented in our patients as most of them are not accessible through mail.

**Table 4:** Symptoms distribution at various intervals of follow-up

Symptoms	15 days follow up		After 1 month follow up		After 2 month follow up		After 3 month follow up	
	Patients (n=446)	Percent %	Patients (n=425)	Percent %	Patients (n=416)	Percent %	patients (n=408)	Percent %
Dyspnoea	96	21.5	37	8.70	5	1.2	0	0.0
cough	87	19.5	59	13.88	9	2.16	1	0.24
Chest Pain	31	7.0	8	1.88	1	0.24	1	0.24
Tiredness/ Easy fatigability	116	26.09	91	21.41	62	14.9	18	4.4
Nil symptoms	167	37.4	268	63.05	333	80.04	388	95
Other symptoms	20	4.48	12	2.89	10	2.4	5	1.2
Death	11	2.5	9	2.11	5	1.2	3	0.73

## Conclusion

Individuals discharged from ICU after COVID 19 has an increased risk of symptoms prevailing for weeks and there is a risk of mortality also. Seeing at the continuing pandemic, clinicians should acknowledge the presence of symptoms and formulate effective interventional strategies among the post COVID patients. Follow up strategies should be optimized to avoid morbidity and mortality.

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