

ORIGINAL RESEARCH

STUDY OF CLINICAL PROFILE OF PATIENTS WITH POST-COVID SYNDROME AT A TERTIARY HOSPITAL

Abhijeet M. Yadav¹, Neelam Deshpande², Sudhir Deshmukh³, Hansraj Kamble⁴,
Santoshkumar Dope⁵

¹Assistant Professor, Department of Respiratory Medicine, VDGMC Latur, India.

²Professor and HOD, Department of Medicine, VDGMC Latur, India.

³Professor and Dean, VDGMC Latur, India.

⁴Junior Resident, Department of Medicine, VDGMC Latur, India.

⁵Associate Professor, Department of Anatomy, VDGMC Latur, India.

Corresponding Author:

Dr. Abhijeet M. Yadav, Kadam Niwas, behind Saiprem Apartment, Vishal Nagar, Latur,
Maharashtra, 413512, India.

Email: abhijeety1988@rediffmail.com

ABSTRACT

Background: Some patients may experience symptoms even after the recovery from Covid 19 termed as Post COVID Syndrome. Long-term follow-up studies on persistent symptoms, lung function, physical, and psychological problems of discharged patients are urgently required. We aimed to describe the long-term consequences of COVID-19 in patients after hospital discharge and identify the potential risk factors.

Material and Methods: Present study was single-center, descriptive observational study, conducted in patients > 14 years, with Covid 19 positive (RTPCR or Rapid antigen) status came to follow up after 14 days of treatment completion.

Results: Out of 500 patients, 254 patients were between 40 to 80 years, 345 males 372 patients (74.4%) required < 14 days hospital stay, 269 patients (53.8%) came to follow up within one month, 408 patients didn't have any comorbidity. Most common symptom present even after the recovery from covid was Generalised weakness (33.8%) followed by cough (29%) shortness of breath (23.4%), rhinitis (23.4%), myalgia (15.8%), joint pain (15.2%), fever (14.8%) & hair loss (13.2%). HRCT of Covid patients and found that 119 patients had HRCT score > 9/25 and 80 patients had HRCT score <9/25. HRCT Findings suggestive of fibrosis was present in 121 patients, air space consolidation was there in 103 patients f/b tractional bronchiectasis in 27 patients. On follow up HRCT there was a very much improvement in the HRCT findings. Only 15 patients and HRCT score >9/25 and 13 patients had <9/25. **Conclusion:** Generalised weakness, cough, shortness of breath, rhinitis, myalgia, were common postcovid symptoms noted. On follow-up chest X ray & HRCT improvement was noted in majority of patients.

Keywords: Generalised weakness, postcovid symptoms, chest X ray, HRCT

INTRODUCTION

COVID-19 is the disease caused by SARS-CoV-2, the coronavirus that emerged in December 2019. COVID-19 can be severe, and has caused millions of deaths around the world as well as lasting health problems in some who have survived the illness.¹

The majority of patients presented with a fever, sore throat, cough, shortness of breath, and chest pain. Many papers have described multi-organ involvement. The acute illness is mild in the majority of the patients. Even so, around 20% of those infected need hospitalization, and around 5% require critical care with non-invasive or mechanical ventilation.^{2,3}

Some patients may experience symptoms even after the recovery from Covid 19. These symptoms are termed as Post COVID Syndrome.³ The epidemiological and clinical characteristics, pathogenesis, and complications of patients with COVID-19 at acute phase have been explicitly described, but the long-term consequences of the illness remain largely unclear.^{4,5} Long-term follow-up studies on persistent symptoms, lung function, physical, and psychological problems of discharged patients are urgently required. We aimed to describe the long-term consequences of COVID-19 in patients after hospital discharge and identify the potential risk factors, including disease severity, associated with these consequences.

MATERIAL AND METHODS

Present study was single-center, descriptive observational study, conducted in outpatient department of medicine (post covid OPD), at Vilasrao Deshmukh Government Institute of Medical Sciences Latur, India. Study duration was of 1 year (1st March 2021 to 28th February 2022). Study was approved by institutional ethical committee.

Inclusion criteria

- Patients > 14 years, with Covid 19 positive (RTPCR or Rapid antigen) status came to follow up after 14 days of treatment completion.

Exclusion criteria

- Active Covid 19 Positive Cases.
- Age less than 14 years
- Pregnant women and lactating woman.
- Patients with active infective diseases like sputum positive PTB, HIV

Study was explained to patients & a written informed consent was taken for participation. Demographic details (Age, Sex, address), clinical history (Addiction, Vaccination status, Presenting Complaints, comorbidity, smoking) were noted followed by in details general physical examination was done.

History regarding COVID infection such as duration of hospital stay, any O₂ requirement, ventilatory requirement, treatment taken, 6 minute walk test, Chest X Ray, HRCT, PFT, 2D-ECHO were noted.

In OPD follow-up clinical symptoms, post covid complications (pulmonary, 2. cardiac, psychological, neurological, renal) were noted & latest laboratory investigations, CXR, HRCT were done.

Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version & Statistical analysis was done using descriptive statistics.

RESULTS

In present study 500 patients were studied. 246 patients were between 15 to 39 years and 254 patients between 40 to 80 years. There were 345 males and 155 females. 372 patients (74.4%) required < 14 days hospital stay while 69 patients (13.8%) required > 14 days hospital stay. 269 patients (53.8%) came to follow up within one month, 152 patients (30.4%) between 1 month to 3 months and 79 patients (15.8%) after 3 months. 408 patients didn't have any comorbidity with most common comorbidity being hypertension (11.6%) followed by diabetes (8.6%).

Table 1: General characteristics

| Characteristic | Frequency | Percentage |
|-------------------------|-----------|------------|
| Age Group | | |
| 15 to 39 | 246 | 49.20% |
| 40 to 80 | 254 | 50.80% |
| Gender | | |
| Male | 345 | 69.00% |
| Female | 155 | 31.00% |
| Hospital Stay | | |
| <14 Days | 372 | 74.40% |
| >14 Days | 69 | 13.80% |
| Home Isolation | 58 | 11.60% |
| Follow up period (days) | | |
| <1 month | 269 | 53.80% |
| 1 month to 3 months | 152 | 30.40% |
| > 3 months | 79 | 15.80% |
| Comorbidity | | |
| No | 408 | 81.60% |
| Hypertension | 58 | 11.60% |
| Diabetes | 43 | 8.60% |
| Bronchial asthma | 6 | 1.20% |
| Hypothyroidism | 4 | 0.80% |

Most common symptom present even after the recovery from covid was Generalised weakness (33.8%) followed by cough (29%) shortness of breath (23.4%), rhinitis (23.4%), myalgia (15.8%), joint pain (15.2%), fever (14.8%) & hair loss (13.2%).

Table 2: Symptoms

| Symptoms | Frequency | Percentage |
|----------------------|-----------|------------|
| Weakness | | |
| Cough | 145 | 29.00% |
| Shortness of breath | 117 | 23.40% |
| Rhinitis | 117 | 23.40% |
| Myalgia | 79 | 15.80% |
| Joint pain | 76 | 15.20% |
| Fever | 74 | 14.80% |
| Hair loss | 66 | 13.20% |
| Headache | 52 | 10.40% |
| Chest pain | 49 | 9.80% |
| Palpitations | 33 | 6.60% |
| Loss of appetite | 32 | 6.40% |
| Tingling | 29 | 5.80% |
| Loss of taste | 21 | 4.20% |
| Polyurea/ polydypsia | 20 | 4.00% |
| Numbness | 11 | 2.20% |

Chest X Ray during COVID infection showed Bilateral lower zone opacities (8.6%), mid lower zone opacities (4.8%) and left lower zone opacities (2.8%). On follow up CXR patients with maximum opacities had turned into fibrosis (5.8%) and Bilateral lower zone opacities (2%).

Table 3: Chest X Ray Findings

| XRAY | During COVID infection | | Follow-up XRAY | |
|-----------------------------|------------------------|------------|----------------|------------|
| | Result | Percentage | Result | Percentage |
| WNL | 307 | 61.40% | 340 | 68.00% |
| B/L LOWER ZONE | 43 | 8.60% | 10 | 2.00% |
| B/L MID LOWER ZONE | 24 | 4.80% | 1 | 0.20% |
| NA | 87 | 17.40% | 111 | 22.20% |
| LEFT LOWER ZONE | 14 | 2.80% | 1 | 0.20% |
| RIGHT MID ZONE | 1 | 0.20% | 1 | 0.20% |
| RIGHT LOWER ZONE | 5 | 1.00% | 1 | 0.20% |
| B/L LOWER ZONE | 3 | 0.60% | 1 | 0.20% |
| B/L LOWER ZONE | 7 | 1.40% | 1 | 0.20% |
| RIGHT MID LOWER ZONE | 1 | 0.20% | 1 | 0.20% |
| B/L UPPER MIDDLE LOWER ZONE | 4 | 0.80% | 1 | 0.20% |
| B/L MID ZONE | 2 | 0.40% | 2 | 0.40% |
| LEFT MID ZONE | 1 | 0.20% | 1 | 0.20% |
| LEFT MID LOWER ZONE | 1 | 0.20% | 1 | 0.20% |
| FIBROSIS | 0 | 0.00% | 29 | 5.80% |

HRCT of Covid patients and found that 119 patients had HRCT score > 9/25 and 80 patients had HRCT score <9/25.

Table 4: HRCT SCORE

| HRCT | Score |
|------|-------|
| NA | 188 |
| 0 | 113 |
| <9 | 80 |
| >9 | 119 |

HRCT Findings suggestive of fibrosis was present in 121 patients, air space consolidation was there in 103 patients f/b tractional bronchiectasis in 27 patients.

Table 4: HRCT FINDINGS

| GGO | NA | YES | NO |
|------------------------------------|-----|-----|-----|
| Fibrosis | 316 | 121 | 63 |
| Interstitial and septal thickening | 316 | 52 | 132 |
| Airspace consolidation | 316 | 103 | 81 |
| Tractional bronchiectasis | 316 | 27 | 155 |
| Honeycombing | 316 | 7 | 177 |
| Nodule | 316 | 0 | 184 |

On follow up HRCT of patients who had previously HRCT score and there was a very much improvement in the HRCT findings. Only 15 patients and HRCT score >9/25 and 13 patients had <9/25. Also, the fibrosis was present in only 2 patients.

Table 5: Follow-up HRCT findings

| FOLLOWUP HRCT | RESULT |
|------------------------|--------|
| 0 | 87 |
| <9 | 13 |
| >9 | 15 |
| NA | 380 |
| FIBROSIS/TB/HC | 1 |
| FIBROSIS | 2 |
| RIGHT PLEURAL EFFUSION | 1 |
| CAVITY | 1 |

DISCUSSION

Even amongst survivors, prolonged symptoms have been noted. These post-COVID symptoms significantly affect the quality of life in patients. Long COVID, or post covid sequelae of COVID-19 infection, is being seen in a growing number of patients reporting a constellation of symptoms, both pulmonary and extrapulmonary, with known or undeciphered mechanisms.⁶

With millions of individuals recovering, the consequence of post COVID-19 symptoms are likely to become an additional burden on the health care delivery system. Moreover, the long term sequelae of COVID-19 infection are not yet fully known, and hence

hamper the attempts to prepare the health care delivery systems to manage the same effectively in the coming months.

There is no agreed definition of Post-COVID-19 Syndrome so far. Greenhalgh et al,⁷ have defined Post-acute COVID-19 as extending beyond 3 weeks from the onset of first symptoms and Post-chronic COVID-19 as extending beyond 12 weeks.

People with long Covid experience a confusing array of persistent and fluctuating symptoms including cough, breathlessness, fever, sore throat, chest pain, palpitations, cognitive deficits, myalgia, neurological symptoms, skin rashes, and diarrhea; some also have persistent or intermittent low oxygen saturations.^{8,9,10} The cause of persisting symptoms is unknown, but probably involves several different disease mechanisms including an inflammatory reaction with a vasculitis component.^{11,12} Documented post-acute sequelae include myo or pericarditis, heart failure, arrhythmias, and thromboembolic complications including myocardial infarction, stroke and venous thrombosis.^{13,14}

Mahmud R et al.,¹⁵ studied 355 patients, 46% patients developed post-COVID-19 symptoms, with post-viral fatigue being the most prevalent symptom in 70% cases. The post-COVID-19 syndrome was associated with female gender, those who required a prolonged time for clinical improvement, and those showing COVID-19 positivity after 14 days of initial positivity. Patients with severe COVID-19 at presentation developed post-COVID-19 syndrome. Patients with fever, cough, respiratory distress, and lethargy as the presenting features were associated with the development of the more susceptible to develop post COVID-19 syndrome than the others. Logistic regression analysis revealed female sex, respiratory distress, lethargy, and long duration of the disease as risk factors.

Daniel A et al.,¹⁶ noted that over a mean follow-up of 140 days, nearly a third of individuals who were discharged from hospital after acute covid-19 were readmitted (14 060 of 47 780) and more than 1 in 10 (5875) died after discharge, with these events occurring at rates four and eight times greater, respectively, than in the matched control group. Rates of respiratory disease, diabetes, and cardiovascular disease were also significantly raised in patients with covid-19, with 770, 127 and 126 diagnoses per 1000 person years, respectively.

Mittal C et al.,¹⁷ studied 100 randomly selected patients, 87% patients developed one or more post covid symptoms. Weakness was reported to be most common problem (55%), followed by body ache (26%) and neuropsychiatric symptoms such as difficulty in concentration and insomnia (22%). Every fifth patient reported that symptoms persisted for more than 1 month. Though most of the respondents classified their symptoms as mild and moderate (52.5% and 37.9% respectively), 47% of the symptomatic patients have to take some treatment for these symptoms. Similar findings were noted in present study.

Anjana NK et al.,¹⁸ studied 154 patients, 63% were women & mean age was 31.49 ± 18.4 years. At least one symptom was present in 120 (78.0%) patients at the time of admission. Cough (18.8%), fever (16.8%), headache (16.2%), rhinitis (14.9%) and sore throat (11.7%) were the major symptoms reported at the time of admission. At the end of three weeks, 11 (7.1%) patients and at the end of three months 18 (11.7%) patients reported to have symptoms. Fatigue (5.8%), headache (5.8%) myalgia (3.2%) joint pain (2.5%) and exertional dyspnea (2.5%) were the predominant symptoms. Presence of fatigue, cough and breathlessness at the time of admission, and presence of another COVID positive family

member were significantly associated with the appearance of post COVID symptoms. Similar findings were noted in present study.

Salamanna F et al.,¹⁹ conducted a systematic review of the current data regarding post-COVID-19 syndrome. They found that 20.70% of reports on long-term COVID-19 symptoms were on abnormal lung functions, 24.13% on neurologic complaints and olfactory dysfunctions, and 55.17% on specific widespread symptoms, mainly chronic fatigue, and pain. Despite the relatively high heterogeneity of the reviewed studies, their findings highlighted that a noteworthy proportion of patients who have suffered from SARS-CoV-2 infection present a “post-COVID syndrome.”

A positive test for Covid-19 is not a prerequisite for diagnosis of post-acute or chronic disease, since many people were never tested and false negative tests are common. The prevalence and patterning of persistent symptoms after Covid-19 is contested. People with persisting symptoms seem to fall into three broad groups: people who were initially hospitalized with acute respiratory distress syndrome (ARDS) and now have long-term respiratory symptoms dominated by breathlessness; people who may not have been hospitalised initially but who now have a multisystem disease with evidence of cardiac, respiratory, or neurological end-organ damage manifesting in a variety of ways; and people who have persisting symptoms, often but not always dominated by fatigue, with no evidence of organ damage.

Knowledge regarding post COVID symptoms will help in the early diagnosis and treatment at the community level. Post COVID clinics at the primary health care level will help to reduce the excess strain that the health system may face during the pandemic.

CONCLUSION

As COVID-19 is causing more panic worldwide, it is crucial to get a comprehensive analysis of the post-recovery states of patients. Generalised weakness, cough, shortness of breath, rhinitis, myalgia, were common postcovid symptoms noted. On follow-up chest X ray & HRCT improvement was noted in majority of patients.

REFERENCES

1. Raghu G, Wilson KC. COVID-19 interstitial pneumonia: monitoring the clinical course in survivors. *Lancet Respir Med* 2020;8:839-42.
2. Russell B, Moss C, George G et al (2020) Associations between immune-suppressive and stimulating drugs and novel COVID-19-a systematic review of current evidence. *E cancer Med Sci* 14:1022. Published 27 Mar 2020
3. Ahmed H, Patel K, Greenwood D, Halpin S, Lewthwaite P, Salawu A, et al. Long-term clinical outcomes in survivors of coronavirus outbreaks after hospitalisation or icu admission: A systematic review and meta-analysis of follow-up studies. *medRxiv* . 2020 Apr 22;2020.04.16.20067975.
4. Udwardia ZF, Pokhariyal PK, Tripathi AK, Kohli A. Fibrotic interstitial lung disease occurring as sequelae of COVID-19 pneumonia despite concomitant steroids. *Lung India* 2021;38:S61-3.

5. Logue JK, Franko NM, McCulloch DJ, McDonald D, Magedson A, Wolf CR, et al. Sequelae in adults at 6 months after COVID-19 infection. *JAMA Netw Open* 2021;4:e210830.
6. Fernández-de-las-Peñas C, Palacios-Ceña D, Gómez-Mayordomo V, Cuadrado ML, Florencio LL. Defining Post-COVID Symptoms (Post-Acute COVID, Long COVID, Persistent Post-COVID): An Integrative Classification. *Int J Environ Res Public Health*. 2021 Mar 5;18(5):2621.
7. Greenhalgh T, Javid B, Knight M et al. What is the efficacy and safety of rapid exercise tests for exertional desaturation in covid-19? *Oxford COVID-19 Evidence Service*; 2020.
8. Carfi A, Bernabei R, Landi F. Persistent symptoms in patients after acute COVID-19. *JAMA*. 2020;324:603–5.
9. Vaes AW, Machado FV, Meys R, Delbressine JM, Goertz YM, Van Herck M, Houben-Wilke S, Franssen FM, Vijlbrief H, Spies Y. Care dependency in nonhospitalized patients with COVID-19. *J Clin Med*. 2020;9(9):2946.
10. Dhont S, Derom E, Van Braeckel E, Depuydt P, Lambrecht BN. The pathophysiology of ‘happy’ hypoxemia in COVID-19. *Respir Res*. 2020;21(1):198.
11. Tay MZ, Poh CM, Rénia L, MacAry PA, Ng LF. The trinity of COVID-19: immunity, inflammation and intervention. *Nat Rev Immunol*. 2020;20:363–74.
12. Libby P, Lüscher T. COVID-19 is, in the end, an endothelial disease. *Eur Heart J*. 2020;41(32):3038–44.
13. Puntmann VO, Carerj ML, Wieters I, Fahim M, Arendt C, Hoffmann J, Shchendrygina A, Escher F, Vasa-Nicotera M, Zeiher AM, et al. Outcomes of cardiovascular magnetic resonance imaging in patients recently recovered from coronavirus disease 2019 (COVID-19). *JAMA Cardiol*. 2020;26:e203557.
14. Mitrani RD, Dabas N, Goldberger JJ. COVID-19 cardiac injury: implications for long-term surveillance and outcomes in survivors. *Heart Rhythm*. 2020; 17(11):1984–90.
15. Mahmud R, Rahman M.M, Rassel MA, Monayem FB, Sayeed SKJB, Islam M.S, et al. (2021) Post-COVID-19 syndrome among symptomatic COVID-19 patients: A prospective cohort study in a tertiary care center of Bangladesh. *PLoS ONE* 16(4): e0249644.
16. Daniel Ayoubkhani, Kamlesh Khunti, Vahé Nafilyan, Thomas Maddox, Ben Humberstone, Ian Diamond, Amitava Banerjee, Post-covid syndrome in individuals admitted to hospital with covid-19: retrospective cohort study, *BMJ* 2021;372:n693
17. Mittal C, Mishra A, Jain S, Gautam NS. Post COVID-19 Symptoms: A Neglected Domain. *Indian J Comm Health*. 2021;33(2):325-328.
18. Anjana NK, Annie TT, Siba S, Meenu MS, Chintha S, Anish TS. Manifestations and risk factors of post COVID syndrome among COVID-19 patients presented with minimal symptoms – A study from Kerala, India. *J Family Med Prim Care* 2021;10:4023-9.
19. Salamanna F, Veronesi F, Martini L, Landini MP and Fini M (2021) Post-COVID-19 Syndrome: The Persistent Symptoms at the Post-viral Stage of the Disease. A Systematic Review of the Current Data. *Front. Med*. 8:653516.

