



TO STUDY VARIOUS SYMPTOMS IN POST CORONAVIRUS DISEASE-19 (COVID-19) PATIENTS IN A TERTIARY CARE CENTRE- A CROSS SECTIONAL STUDY

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ABSTRACT

Corona virus was a major challenge throughout the globe. Post-acute COVID-19 is defined as the presence of symptoms extending beyond 3 weeks from the initial onset of symptoms and chronic COVID-19 as extending beyond 12 weeks. It was observed that the common complications among hospitalized patients with COVID-19 include pneumonia, acute respiratory distress syndrome, acute liver injury, cardiac injury, acute heart failure, dysrhythmias and myocarditis and prothrombotic coagulopathy resulting in venous and arterial thromboembolic events (10-25%) acute kidney injury (9%); neurologic manifestations, including impaired consciousness (8%) and acute 1 cerebrovascular disease (3%); and shock (6%). The present cross-sectional observational study was conducted in the Department of Medicine, Government Medical College, Jammu for a period of one year, w.e.f 1st November 2020 to 31st October 2021 with the aim to investigate the post-COVID-19 manifestation to demonstrate the different symptoms or signs that appeared on subjects after recovery from the disease, also to link these symptoms with several factors (age, sex, disease severity). And also, to detect the percentage, type, and risk factors of persistent symptoms after improvement from acute COVID-19 infection. In 200 patients during post covid period symptoms of disease were recorded, fever was most frequent complain (48.5%), followed by cough (38%), dyspnea was present in 51 subjects (25.5%), 21(10.5%) patients complain of loss of taste sensation, 18 (9%) patients had loss of smell, complain of lethargy was by 17 (8.5%) subjects, headache by 10 (5%), myalgia by 8 (4%), diarrhea by 7 (3.5%) and whereas only 3% had complain of arthralgia. It was concluded that patients with COVID-19 require long-term follow-up even after recovery for observation and management of their post-COVID ailments. A comprehensive rehabilitation program is essential for such patients during hospitalization and discharge.

KEYWORDS

COVID-19, Complications, Manifestations, Risk, Hospitalization and Rehabilitation.

INTRODUCTION

Corona virus has become a major pathogen causing an outbreak affecting humankind. In 2019, a similar disease was identified from Wuhan province, in China. The respiratory disease caused by the novel corona virus, designated COVID-19 (Coronavirus disease 2019), and was declared as a Public Health Emergency of International Concern on 30 January 2020. World Health Organization (WHO) declared the Coronavirus outbreak as pandemic on 11 March 2020.¹

Common complications among hospitalized patients with COVID-19 include pneumonia (75%), acute respiratory distress syndrome (15%); acute liver injury, characterized by elevated transaminases and bilirubin (19%); cardiac injury, including troponin elevation (7-17%), acute heart failure, dysrhythmias and myocarditis.² Prothrombotic coagulopathy resulting in venous and arterial thromboembolic events (10-25%)³ acute kidney injury (9%); neurologic manifestations, including impaired consciousness (8%) and acute 1 cerebrovascular disease (3%); and shock (6%).⁴ Rare complications among critically ill patients with COVID-19 include cytokine storm and macrophage activation syndrome.

Post-acute COVID-19 is defined as the presence of symptoms extending beyond 3 weeks from the initial onset of symptoms and chronic COVID-19 as extending beyond 12 weeks. However, the recovery course is variable and depends on age and pre-existing comorbidities in addition to illness severity.⁵ Acute COVID-19 usually lasts until 4 weeks from the onset of symptoms, beyond which replication-competent SARS-CoV-2 has not been isolated. Post-acute COVID-19 is defined as persistent symptoms and/or delayed or long-term complications beyond 4 weeks from the onset of symptoms.⁶

Hence, the current study was done with the aim to investigate the post-COVID-19 manifestation to demonstrate the different symptoms or signs that appeared on subjects after recovery from the disease, also to link these symptoms with several factors (age, sex, disease severity). And also to detect the percentage, type, and risk factors of persistent symptoms after improvement from acute COVID-19 infection.

MATERIALS AND METHODS

This was a cross-sectional observational study was conducted in the Department of Medicine, Government Medical College, Jammu for a period of one year, w.e.f 1st November 2020 to 31st October 2021. Prior approval from The Institutional Research Committee and The Ethical committee was taken before the commencement of the study and a consent form was signed by patients after describing them all the details of research. The study population included in the research were survivors of COVID-19 infection (post COVID 19) who were of more than 18 years of age of either sex, presenting to department of medicine, after one month of recovery from COVID 19 infection. Patients with age less than 18 years of age, pregnant females, suffering from other diseases like anemia, chronic kidney diseases, chronic liver disease, malignancy, chronic fatigue syndrome were excluded from the study.

Detailed clinical evaluation including history, the review of systems including questioning related to post-covid symptoms like fatigue, dyspnea, chestpain, palpitations, cough, rhinitis, sore throat, fever, anosmia, dysgeusia, myalgias, joint pain, diarrhea, loss of appetite, headache, vertigo, red eyes, dermatological symptoms, were recorded. Relevant investigations were performed in all patients like complete blood count, renal function test, liver function test, chest x-ray, electrocardiography, computed tomography chest. All relevant information regarding patients were noted on an already prescribed Performa and then was entered in excel sheet.

Descriptive data will be expressed as a percentage, range and median and appropriate statistical technique will be applied to find out statistical significance of any appropriate difference and associate.

RESULTS

Out of 200 subjects included in study, there was a male predominance (n=127, 63.5%) over females (n=73, 36.5%). The male female ratio was 1.73:1. In 200 patients during post covid period symptoms of disease were recorded, fever was most frequent complain (n=97, 48.5%), followed by cough (n=76, 38%), dyspnea was present in 51 subjects (25.5%), 21(10.5%) patient complain of loss of taste sensation, 18 (9%) patient had loss of smell, complain of lethargy was by 17 (8.5%) subjects, headache by 10 (5%), myalgia by 8 (4%),

diarrhea by 7 (3.5%) and whereas only 3% (n=6 had complain of arthralgia. (Table 1)

Table 1: Symptoms

Symptoms	N=200	%
Fever	97	48.5
Cough	76	38
Loss of Taste	21	10.5
Loss of Smell	18	9
Lethargy	17	8.5
Dyspnea	51	25.5
Headache	10	5
Myalgia	8	4
Diarrhea	7	3.5
Arthralgia	6	3

Temperature >38° C, oxygen saturation <90%, received supplemental oxygen at triage, respiratory rate >24 breath/min and heart rate >100 beats/min was reported among 48.5%, 16.5%, 28.5%, 21.5% and 52% of the subjects respectively in this study. (Table 2)

Table 2: Vitals of patients

Parameters	N	%
Temperature >38° C	97	48.5
Oxygen Saturation <90%	33	16.5
Received Supplemental Oxygen at Triage	57	28.5
Respiratory Rate >24 Breath/min	43	21.5
Heart Rate >100 Beats/min	104	52

Median white blood cell (*10⁹/L) was 7.2, aspartate aminotransferase (U/L) was 48, alanine aminotransferase (U/L) 35, creatine kinase (U/L) was 168, procalcitonin (ng/mL) was 0.3, D-dimer (ng/mL) was 441, C- reactive protein (mg/dL) was 12.8, lactate dehydrogenase (U/L) was 409, Dearranged Blood Sugar, N (%) was 193(6.43%) and length of hospital stay was 4.92 in this study. (Table3)

Table 3 : Laboratory findings and hospitalization among the study subjects

Parameters	Median	IQR
White Blood Cell*10 ⁹ /L	7.2	5.1-9.8
Aspartate aminotransferase, U/L	48	30-74
Alanine aminotransferase, U/L	35	20-57
Creatine kinase, U/L	168	80-404
Procalcitonin, ng/mL	0.3	0.1-0.5
D-dimer, ng/mL	441	256-901
C-reactive protein, mg/dL	12.8	6.2-27.3
Lactate dehydrogenase, U/L	409	296-547.20
Blood Sugar, N (%)	193 (6.43)	100-280
Length of Hospital Stay	4.92	2.1-9.7

The most common Post-covid respiratory symptoms was dyspnea (n=64, 32%), followed by cough (n=23, 10.5%), 4 (2%) patient complained of rhinitis, 3 patient complained of sore throat, and only 2 subjects had complained of sputum production. The most common Post-covid Cardiovascular Symptoms was Dyspnea on exertion (n=54, 27%), followed by Palpitations (n=29, 14.5%), 13 subjects complained of chest pain and only 6 complained of Orthopnea.

The most common Post- covid Neurological Symptoms was Anosmia (n=43, 21.5%), followed by Dysgeusia (n=24, 12%), headache was reported by 16 (8%) subjects, confusion by 7 (3.5%) subjects, vertigo by 2 (1%) patient, only one subject (0.5%) reported abnormal body moment (seizure), stroke by 2(1%). The most common Post-covid GIT Symptoms was diarrhea (n=34, 17%), followed by Vomiting (n=13, 6.5%) and only 8 subjects (4%) reported abdominal pain.

The most common Post-covid Psychiatry Symptoms was insomnia (n=54, 27%), followed by depression (n=9, 4.5%) and anxiety (n=8, 4%). The Post-covid Dermatological symptoms were shown in 5 (2.5%) subjects. The most common Post-covid Musculoskeletal Symptoms was fatigue (n=103, 51.5%), followed by Myalgias (n=11, 5.5%) and Joint/Back Pain (n=4, 2%). Other complications which were noticed post COVID included Ophthalmological problems (n=12, 6%), fever (n=16, 8%) and weight loss (n=9, 4.5%) (Table 4)

Table 4: Post-covid symptoms

Respiratory Symptoms	N	%
Cough	23	10.5
Dyspnea	64	32
Rhinitis	4	2
Sore Throat	3	1.5
Sputum production	2	1
Cardiovascular Symptoms	N	%
Chest pain	13	6.5
Palpitations	29	14.5
Dyspnea on exertion	54	27
Orthopnea	6	3
Neurological Symptoms	N	%
Anosmia	43	21.5
Dysgeusia	24	12
Headache	16	8
Vertigo	2	1
Confusion	7	3.5
Abnormal body movement (seizure)	1	0.5
Weakness of limb (Stroke)	2	1
Memory Loss	0	0
GIT Symptoms	N	%
Diarrhea	34	17
Vomiting	13	6.5
Pain abdomen	8	4
Psychiatry Symptoms	N	%
Depression	9	4.5
Insomnia	54	27
Anxiety	8	4
Substance use	0	0
Symptoms	N	%
Dermatological	5	2.5
Musculoskeletal Symptoms	N	%
Fatigue	103	51.5
Myalgias	11	5.5
Joint/Back Pain	4	2
Other Symptoms	N	%
Ophthalmological	12	6
Fever	16	8
Weight Loss	9	4.5

DISCUSSION

The present study analyzed clinical and laboratory results from follow-up reviews of 200 7COVID-19 patients a median of 30 days after hospital discharge. At the time of the visit, a high percentage of patients complained of one or more persistent symptoms. Similar findings have been observed in recent studies, based on face-to-face reviews or telephone/web surveys, on both COVID-19 inpatient and outpatient populations (Carfi A *et al.*, 2020; Tenforde MW *et al.*, 2020). The wide range of reported symptoms reflects the multi-organ involvement of COVID-19, mediated by tissue damage, hyper inflammation, and coagulopathy.^{7,8}

In the present study, of the total 200 subjects, there was a male predominance (n=127, 63.5%) over females (n=73, 36.5%). The male female ratio was 1.73:1. The results were in accordance to result of Mahmud R *et al.*, (2021), performed a study on 355 subjects and found that ratio of male and female patients was 1.4:1. According to findings of Spinicci M *et al.*, (2021), of the total 100 subjects included in study 41% were females and rest were male subjects.^{9,10}

Median white blood cell (*10⁹/L) was 7.2, aspartate aminotransferase (U/L) was 48, alanine aminotransferase (U/L) 35, creatine kinase (U/L) was 168, procalcitonin (ng/mL) was 0.3, D- dimer (ng/mL) was 441, C- reactive protein (mg/dL) was 12.8, lactate dehydrogenase (U/L) was 409, Deranged Blood Sugar, N (%) was 193 (6.43%) and length of hospital stay was 4.92 in this study. These observations could help tailor laboratory assessment for patients diagnosed with COVID-19, and can predict the post covid symptoms which patient might show after recovery. Temperature >38° C, oxygen saturation <90%, received supplemental oxygen at triage, respiratory rate >24 breath/min and heart rate >100 beats/min was reported among 48.5%, 16.5%, 28.5%, 21.5% and 52% of the subjects respectively in this study. Fever was most frequent symptom on presentation (n=97, 48.5%), followed by cough (n=76, 838%), dyspnoea (n=51, 25.5%), 21(10.5%) patient complained of loss of taste sensation, 18 (9%) patient had loss of smell,

complaint of lethargy was by 17 (8.5%) subjects, headache by 10 (5%), myalgia by 8 (4%), diarrhoea by 7 (3.5%) and whereas only 3% (n=6) had complain of arthralgia. According to findings of Macera M, *et al.*, (2021) most common symptoms at the onset of illness were fever (77%) followed by fatigue (60%), myalgia (58%), lack of appetite (58%), dry cough (37%). Other symptoms were diarrhoea (20%), dysgeusia (33%), nausea (8%), conjunctivitis (5%), skin lesions (5%).¹¹ Blomberg, B *et al.*, (2021) found that in 272 patients fatigue was most common (90%, 244/272), followed by cough (71%), headache (64%), myalgia (58%), whereas only 21% had fever.¹²

The most common Post-covid respiratory symptoms was dyspnea (n=64, 32%), followed by cough (n=23, 10.5%), 4 (2%) patient complained of rhinitis, 3 patient complained of sore throat, and only 2 subjects had complained of sputum production. Abdelrahman MM *et al.*, (2021) found in their study that, as regards the respiratory system, they noticed that dyspnea, dry cough (8.1%), and chest pain were the most frequent persistent complaint.¹³ Blomberg, B *et al.*, (2021) found that in 272 patients, dyspnea was present in (55%) of the subjects.¹² In present study, the most common Post-covid Cardiovascular Symptoms was Dyspnoea on exertion (n=54, 27%), followed by Palpitations (n=29, 14.5%), 13 subjects complained of chest pain and only 6 complained of Orthopnea. According to findings of Mahmud R *et al.*, (2021)⁹ post-exertional dyspnea was present in 7% of the subjects. Studies have shown that cardiac injury is a common condition among hospitalized patients and is associated with a higher risk of in-hospital mortality (Fried JA *et al.*, 2020; Shi S *et al.*, 2020). This may be related to angiotensin-converting enzyme 2 (ACE2) acting as the receptor for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (South AM *et al.*, 2020). Epidemic diseases have a psychological impact on both infected and non-infected persons (Shanafelt T *et al.*, 2020).^{14,15,16,17}

The most common Post-covid Neurological Symptoms was Anosmia (n=43, 21.5%), followed by Dysgeusia (n=24, 12%), headache was reported by 16 (8%) subjects, confusion by 7 (3.5%) subjects, vertigo by 2 (1%) patient weakness of limb (stroke) by 2(1%) and only one 1 subject (0.5%) reported abnormal body moment (seizure). The most common Post-covid Psychiatry Symptoms was insomnia (n=54, 27%), followed by depression (n=9, 4.5%) and anxiety (n=8, 4%). According to findings of Mahmud R *et al.*, (2021) headache was present in 3.4% subjects, vertigo in 2.3% patients, and sleep-related disorders were recorded in 5.9% patients.⁹

The most common Post-covid GIT Symptoms was diarrhea (n=34, 17%), followed by Vomiting (n=13, 6.5%) and only 8 subjects (4%) reported abdominal pain. According to study done by Mahmud R *et al.* (2021) diarrhea was present in 23 (6.5%) subjects and vomiting was complain of 17 (4.8%) subjects.⁹

The Post-covid Dermatological symptoms were shown in 5 (2.5%) subjects. The most common Post-covid Musculoskeletal Symptoms was fatigue (n=103, 51.5%), followed by Myalgias (n=11, 5.5%) and Joint / Back Pain (n=4, 2%). According to study done by Abdelrahman MM *et al.*, (2021) found in their study that, Joint pain (12.2%), alopecia (10.5%).¹³ Other complications which were noticed post COVID included Ophthalmological problems (n=12, 6%), fever (n=6, 8%) and weight loss (n=9, 4.5%). Abdelrahman MM *et al.*, (2021) found in their study that, fever was present in 7% of the subjects and Visual disorders in 11% subject.¹³ Vision and hearing impairment may be part of peripheral nervous system manifestations (Mao L *et al.*, 2020).²

CONCLUSION

The present study concluded that patients with COVID-19 require long-term follow-up even after recovery for observation and management of their post-COVID ailments. A comprehensive rehabilitation program is essential for such patients during hospitalization and discharge. During the ongoing COVID-19 pandemic, most health facilities were overloaded. Hence, arranging follow-up for patients can be a challenge. However, a significant population in the post-COVID state needs continuous monitoring. Patients presenting with respiratory distress, patients with lethargy, and patients with a disease for a prolonged duration require special attention in the postCOVID-19 state. The most common early clinical sequelae in COVID-19 survivors include physical decline/fatigue, fever, cough, dyspnea, dyspnea on exertion, Anosmia, Insomnia, Fatigue, palpitations and fever.

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