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ORIGINAL ARTICLE

Post Discharge Outcome of COVID 19 Cases Reported from Pakistan

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ABSTRACT

Aim: To characterize the clinical outcome of COVID-19 patients following discharge from the hospital.
Study design: Prospective cohort study.
Place and Duration of Study: Department of Infectious Diseases, Liaquat National Hospital, Karachi from 1st May to 31st August 2020.
Methodology: Ninety six patients were included, age over 23 years and had a confirmed COVID-19 on PCR. At the time of admission and on discharge, in-hospital data were recorded. The demographic information, symptoms, complete blood count, inflammatory markers, and chest X-ray noted.
Results: Diabetes (50%) and Ischemic heart disease (50%) were the most frequent comorbidities. The majority of patients (75%) improved their X-ray findings after being discharged from the hospital. At the time of discharge, 75% of the patients expressed fatigue; none of the patients developed a fever. There was a substantial significant difference in tiredness reported at discharge and in the fourth week. Significant variations in shortness of breath and oxygen consumption were also found between tiredness indicated at discharge and the fourth week. The majority of lab values were within normal limits.
Conclusion: Most patients gradually improved after receiving appropriate treatment and supportive care in the hospital and later at home. The most prevalent and prolonged symptom reported by most patients was fatigue. By the fourth week, most symptoms had ameliorated significantly.
Keywords: SARS-CoV2, Clinical outcome, Fatigue, COVID-19 follow-up

INTRODUCTION

The SARS-CoV2 virus epidemic is a public health disaster that has had devastating consequences all around the world.[1] Except for a few studies from high-income nations, the long-term effects of COVID-19 after discharge have not been documented in the literature. There is a scarcity of published or available data from medium or low-income countries to characterize the clinical outcome of COVID-19 patients after discharge from the hospital. On February 26th, 2020, the first verified case of COVID 19 in Pakistan was recorded. As of January 20th, 2021, there have been around 524,783 confirmed cases in the country, with 478,517 recoveries and 11,103 fatalities.[2] Due to its dense population, Karachi, Pakistan's commercial center, has the highest number of recorded cases.[3] Numerous research have been done worldwide on this pandemic, with many of them detailing the disease's progression during hospitalization.[4-6] However, as the number of recovered patients grows, more information on the long-term effects of COVID-19 infections is becoming available.[7] In the United Kingdom, for example, roughly 10% of individuals who recovered from COVID-19 had long-term problems.[8] The phrases "long haulers," "long COVID," and "long-term COVID-19" have all been used to describe these patients. Despite this, the long-term consequences of COVID-19 following discharge are poorly documented in the literature[10,11]. While studies are now underway, the majority are in high-income nations. The post-hospitalization COVID-19 Study (PHOSP-COVID) in the United Kingdom, for example, intends to follow 10,000 patients for a year, assessing clinical variables such as blood tests and scans, and collecting data on bio markers[7.]

COVID-19 infection symptoms can last up to 35 days after being discharged from the hospital, impairing people's capacity to conduct everyday tasks and their quality of life, as well as their health, mental, social, and physical function. The capacity to prepare for and provide post-acute medical, psychological, and physical treatments to enable recovery from COVID-19 infection, including the ability to return to work, depends on identifying symptoms that require early care[11].

The study was focused to characterize the clinical outcome of COVID-19 patients following discharge from the hospital. Because illnesses like chronic fatigue syndrome, which may be linked to lengthy COVID, are under-recognized in low- and middle-income countries, it's critical to know how common this problem.[12] As a result, we wanted to follow the long-term course of COVID 19 patients after they were discharged from one of Karachi's largest and busiest tertiary care hospitals.

The objective of the study was to characterize the clinical outcome of COVID-19 patients following discharge from the hospital.

MATERIALS AND METHODS

This prospective cohort study was carried out after permission from IRB in the Department of Infectious Diseases Liaquat National Hospital, Karachi from 1st May to 31st August 2020. Patients were included in the study if they were over the age of 18 and had a confirmed COVID-19 on PCR. Patients were released from the hospital if they had been afebrile for at least three days or if their respiratory symptoms and radiological abnormalities on chest radiography had resolved considerably. Those who were either unable to be contacted after discharge (i.e., lost to follow-up after two weeks despite reminder calls) or refused to participate in the research were excluded.

At the time of admission and on discharge, in-hospital data were collected, which included demographic information, symptoms, complete blood count, inflammatory markers, and a chest X-ray. Data from the post-hospitalization period was collected by a weekly follow-up for up to four weeks via phone calls. Following biochemistry lab parameters were included: haemoglobin, total leukocyte count, neutrophils, lymphocytes, neutrophil-lymphocyte ratio, absolute lymphocytes count, CRP (C

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reactive protein), LDH (lactate dehydrogenase), d-dimers and ferritin.

The data was entered in SPSS-25. The Chi-square test was applied to see the difference of significance between clinical symptoms groups. An independent samples t-test was applied to see the difference of significance between biochemistry levels on discharge and the first week after discharge. A p-value less than 0.050 was taken as significant.

RESULTS

The overall mean age of discharged patients was 54 years, ranging from 23 to 82 years. Patients had stayed in the hospital from one day to 43 days and average stay was 9 days. Majority of the discharged patients were males (78%) and nearly quarter of the patients had no co morbid 26 (27.1%). The commonest comorbidities were Diabetes (50%) and Ischemic heart disease (50%) followed closely by Hypertension (44.8%). A significant number of patients (27%) had no comorbidities. Several other diseases like chronic renal and liver diseases also existed in minor percentages in the patients. Most patients were admitted to the ward (42%), whereas 34% were admitted to the Intensive Care Unit and 24% required a High Dependency Unit. Two third of patients had residual symptoms at the time of discharge. Fatigue was reported in 75% of the patients, while none of the patients had fever. Cough was present in 23% of patients. Nearly half of the patients (45%) had shortness of breath (SOB) and 48% required 2 liters of domiciliary oxygen (Table 1).

Table 1: Patients' demography and clinical background (n=96)

Variable	No.	%age
Age (years)	53.83±12.82	
Hospital stay (days)	9.08±5.503	
Gender		
Male	75	78.125
Female	21	21.875
Comorbidities (at admission)		
Hypertension	43	44.79
Mellitus diabetes	48	50.0
Ischemic heart disease	48	50.0
Chronic renal disease	2	2.08
Chronic liver disease	1	1.04
Malignancy	0-	-
Others (Parkinson, Asthma, CVA, Hepatitis C, COPD, Asthma, Brain Tumor, hypothyroidism, & depression)	16	16.66
None	26	27.08
Unit of Admission		
Ward	40	41.66
High dependency unit	23	23.95
Intensive care unit	33	34.37
Chest X-Ray (Discharge)		
Improved	72	75.0
Normal	24	25.0
Chest X-Ray (First week)		
Improved	6	6.25
Normal	24	25.0
Same	66	68.75
Fever (on discharge)		
Yes	-	-
No	96	100.0
Cough (on discharge)		
Yes	22	22.91
No	74	77.09
Fatigue (on discharge)		
Yes	72	75.0
No	24	25.0
Shortness of Breath (on discharge)		
Yes	45	46.87
No	51	53.13
Oxygen Dependence (on discharge)		
Yes	46	47.91
No	50	52.09

Sixty three patients were symptoms at first week after discharge. All of them reported fatigue (100%) while 41% complained about shortness of breath and on 32% had cough. At the end of the fourth week post discharge only 26 patients had symptoms and again 100% of them had fatigue while 23% had shortness of breath (Table 2).

From the discharge and at fourth week post discharge, there was a significant difference in fatigue (p<0.0001), shortness of breath (p=0.0045), and domiciliary oxygen requirement (p=0.000541) [Table 3].

At discharge most lab parameters were within normal range. There were some deranged values. The mean value of neutrophils was slightly higher (73.02±11.3). Lactate dehydrogenase showed higher mean values of 406.6. D-dimers measured in at a high mean value: 1.595. Mean ferritin levels were very high at 943. After 1st week of discharge the LDH averaged at a high 283u/L, D-dimers were averaging at 0.9 while mean ferritin levels were also high at 555 ng/ml. Significant differences observed in following biochemistry variables at discharge and after first week of discharge: neutrophils (p value: 0.0008), lymphocytes (p value: 0.0005), neutrophils-lymphocyte ratio (p=0.0006), absolute lymphocytes count (p<0.0001), CRP (p=0.0096), LDH (p<0.0001), d-dimers (p value: 0.0008) and ferritin (p-0.0005) [Table 4].

Table 2: Presence of clinical symptoms in patients after discharge

Parameter	At 1st week (n=63)	At 2nd week (n=52)	At 3rd week (n=34)	At 4th week (n=26)
Cough	20(31.7%)	8(15.3%)	2(5.8%)	1(3.8%)
Fatigue	63(100%	52(100%)	34(100%)	26(100%)
Shortness of breath	26(41.2%	17(32.6%)	9(26.4%)	6(23%)
Oxygen dependence	14(22.2%	5(9.6%)	1(2.9%)	1(3.8%)

Table 3: Comparison of patients on discharge versus at 4th weeks

Variable	Chi-square	P-value
Cough	0	1.000
Fatigue	20.669	0.0001*
Shortness of breath	8.068	0.0045*
Oxygen dependence	11.9675	0.000541*

*Significant

Table 4: Comparison of laboratory tests in patients on discharge and after 1st week of discharge (n=96)

Laboratory test	On Discharge	After 1st week of discharge	P value
Hemoglobin (gm/dL)	12.57±1.775	12.86±1.813	0.2642
Total leukocyte count (x10^3/uL)	9.75±4.079	10.42±4.04	0.2543
Neutrophils (%)	73.02±11.3	67.47±11.209	0.0008*
Lymphocytes (%)	20.18±10.04	25.32±10.16	0.0005*
Neutrophil lymphocyte ratio	5.11±3.522	3.55±2.60	0.0006*
Absolute lymphocytes count (/uL)	1733±896.90	2497.10±1348.18	<0.0001*
CRP (mg/L)	4.08±9.21	1.50±2.93	0.0096*
LDH (U/L)	406.6±162.87	283.33±79.56	<0.0001*
D-Dimers	1.595±1.71	0.908±0.973	0.0008*
Ferritin (ng/mL)	943.47±982.37	555.06±425.68	0.0005*

*Highly significant

DISCUSSION

We monitored the 97 COVID 19 patients' post-hospitalization symptoms for up to four weeks to evaluate how quickly they recovered. All of the patients in our study, like those in earlier studies, were on a path to recovery[11-15]. Balachander et al[16] observed that there is no link between co-morbidities and the existence of symptoms at discharge and persistent of symptoms post discharge. The average hospital stay in our study was shorter i.e. 9 days as compared Wang et al[14] and Carfi et al[17] studies in

which the average length of stay in the hospital was 14 and 17 days respectively. Luo et al[15] and Wang et al[18] also found that the majority of symptomatic patients (64.9%) became asymptomatic by the end of the fourth week, although Garrigues et al[13] reported persisting post-hospitalization symptoms for a longer length of time. Fatigue, exhaustion, and shortness of breath were the most frequent symptoms that lasted at the end of the fourth week, which is consistent with other studies that have found fatigue and shortness of breath to be the most common symptoms following hospitalization[13,14].

Logue et al[19] reported that fatigue (13.6%) and loss of smell or taste were the most frequent lasting complaints (13.6%) upto 9 months. After coronavirus disease 2019, many people have chronic symptoms and a decrease in health-related quality of life. Previous research has focused on hospitalized patients 30 to 90 days after disease onset, with symptoms lasting up to 110 days. Outpatients' long-term consequences have not been thoroughly studied. Even most of the people with noncritical COVID-19 reported symptoms. Whatever the initial clinical manifestation, it appears that individuals with COVID-19 require a long-term medical follow-up.[20] Consistent with our study, Goertz et al[21] studied a total of 112 hospitalized patients and 2001 non-hospitalized individuals and found that during the infection, the most of the symptoms decreased substantially. The most common symptoms were tiredness and dyspnea. This, points to the existence of a "post-COVID-19 syndrome" and the unmet healthcare requirements of a portion of individuals with "mild" or "severe" COVID-19. COVID-19 symptoms can last up to 35 days, wreaking havoc on one's quality of life, health, and physical and mental abilities.

In 2 months' study, Leth et al[22] reported that at the 12-week follow-up, 96% of participants reported 1 or more persistent symptoms. Fatigue, dyspnea, cough, chemosensory dysfunction, and headache were the most common complaints. A wide variety of persisting symptoms were observed 12 weeks following hospitalization in COVID-19 patients, indicating the need for bigger descriptive investigations and multidisciplinary research partnerships. Garrigues et al[13] reported that there were no statistically significant differences in such symptoms between the ward and ICU patients which is comparable to our study. A total of 274 patients took part in the research by Otuonye et al[23] early fatigue, headaches, and chest discomfort were the most persistent COVID-like symptoms. Patients who have recovered from COVID-19 illness may continue to suffer COVID-19-like symptoms, such as fatigue and headaches. As a result, after discharge, COVID-19 survivors should be closely monitored to help minimize the impact of these symptoms and enhance their quality of life.

In most of our patients, as in earlier investigations, there was a considerable improvement in chest radiological findings[15,18]. The majority of the patients had returned to their usual daily activities by the end of the fourth week. This present observational research is from Pakistan on the post-hospitalization characteristics of COVID-19.

Our study has some limitations, including a small sample size from a single location, only 4 weeks of follow-up data instead of longer and insufficient data on post-COVID life quality.

CONCLUSION

The most COVID-19 survivors recovered significantly after discharge, as evidenced by symptom reduction and radiological improvement. Most patients gradually improved after receiving appropriate treatment and supportive care in the hospital and later at home. The most prevalent and prolonged symptom reported by most patients was fatigue. A few required oxygen at home to cater for the shortness of breath. By the fourth week, most symptoms had ameliorated significantly. The laboratory findings were also progressively improving over time after discharge from the hospital. To fully understand the physiological and psychological consequences of COVID-19 on recovered patients, a longer follow-up period with objective assessments of symptom persistence and quality of life ratings is required. This will aid us in developing and improving a rehabilitation system that will raise COVID-19 survivors' morale and assist them in returning to normalcy.

Conflict of interest: Nil

REFERENCES

1. Sarwar S, Waheed R, Sarwar S, Khan A. COVID-19 challenges to Pakistan: Is GIS analysis useful to draw solutions? Sci Total Environ 2020;730:139089.
2. Government of Pakistan. 2020; https://covid.gov.pk/.
3. Noreen N, Dil S, Niazi S, et al. COVID 19 Pandemic & Pakistan; Limitations and Gaps. Global Biosecurity 2020;1(4).
4. Liang WH, Guan WJ, Li CC, et al. Clinical characteristics and outcomes of hospitalised patients with COVID-19 treated in Hubei (epicentre) and outside Hubei (non-epicentre): a nationwide analysis of China. Eur Respir J 2020;55(6):2000562.
5. Swann OV, Holden KA, Turtle L, et al. Clinical characteristics of children and young people admitted to hospital with covid-19 in United Kingdom: prospective multicentre observational cohort study. BMJ 2020;370.
6. COVID TC, Team R. Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19)-United States, February 12-March 16, 2020. MMWR 2020;69(12):343-346.
7. Marshall M. The lasting misery of coronavirus long-haulers. Nature 2020;585(7825):339-41.
8. Greenhalgh T, Knight M, A'Court C, Buxton M, Husain L. Management of post-acute covid-19 in primary care. 2020;370.
9. Baig AM. Chronic COVID Syndrome: Need for an appropriate medical terminology for Long-COVID and COVID Long-Haulers. 2020.
10. COVID TC, Team RJ. Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19). MMWR 2020;69(12):343-6.
11. Luo S. A follow-up study of recovered patients with COVID-19 in Wuhan, China. Int J Infec Dis 2020;99:2.
12. Cho H, Menezes P, Hotopf M, Bhugra D, Wessely S. Comparative epidemiology of chronic fatigue syndrome in Brazilian and British primary care:
13. Garrigues E, Janvier P, Kherabi Y, Le Bot A, Hamon A, Gouze H, Doucet L, Berkani S, Oliosi E, Mallart E, Corre F. Post-discharge persistent symptoms and health-related quality of life after hospitalization for COVID-19. J Infec 2020; 81(6):e4-6.
14. Carfì A, Bernabei R, Landi F. Persistent Symptoms in patients after acute COVID-19. JAMA 2020;324(6):603-5.
15. Luo S, Guo Y, Zhang X, Xu H. A follow-up study of recovered patients with COVID-19 in Wuhan, China. Int J Infec Dis 2020;99:408-9.
16. Balachandar V, Mahalaxmi I, Subramaniam M, et al. Follow-up studies in COVID-19 recovered patients - is it mandatory? Sci Total Environ 2020;729:139021.
17. Wang X, Xu H, Jiang H, et al. Clinical features and outcomes of discharged coronavirus disease 2019 patients: a prospective cohort study. QJM 2020; 113(9):657-65.
18. Liang WH, Guan WJ, Li CC, et al. Clinical characteristics and outcomes of hospitalised patients with COVID-19 treated in Hubei (epicentre) and outside Hubei (non-epicentre): a nationwide analysis of China. Eur Respir J 2020;55(6).
19. 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 2021;4(2):e210830.
20. Carvalho-Schneider C, Laurent E, Lemaignen A, Beaufils E, Bourbao-Tournois C, Laribi S, et al. Follow-up of adults with noncritical COVID-19 two months after symptom onset. Clin Microbiol Infec 2021;27(2):258-63.
21. Goërtz YM, Van Herck M, Delbressine JM, Vaes AW, Meys R, Machado FV, et al. Persistent symptoms 3 months after a SARS-CoV-2 infection: the post-COVID-19 syndrome?. ERJ 2020;6(4).
22. Leth S, Gunst JD, Mathiasen V, Hansen K, Søgaard O, Østergaard L, et al. Persistent symptoms in patients recovering from COVID-19 in Denmark. In: Open Forum Infectious Diseases. US: Oxford University Press, 2021;8.
23. Otuonye NM, Olumade TJ, Ojetunde MM, Holdbrooke SA, Ayoola JB, Nyam IY, et al. Clinical and demographic characteristics of COVID-19 patients In Lagos, Nigeria: a descriptive study. J Nat Med Assoc 2021;113(3): 301-6.