Study of persisting clinical symptoms of Covid 19 survivors after one year of discharge from a tertiary care center

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Abstract

Introduction: The world is at this unique junction of uncertainty for Covid outbreak and its future consequences. The world on one way progressing towards natural and vaccine acquired immunity and in another way there is risk of emergence of new variants of SARS-CoV-2, so it is important to understand Covid-19 disease progression and the long-term consequences of SARS-CoV-2 infection. SARS-CoV-2 infection with diabetes had a high prevalence of disease severity and more adverse outcome during the second wave in India and the world. That also necessitates the long-term monitoring and follow-up of Covid cases in high risk population for early alarming and managing.

Material and methods: A longitudinal single centre cohort study has been conducted among COVID patients who recovered and discharged from the tertiary care centre from 1st April 2021 to 31st May 2021. Number of cases, n=86 (Male=50, female=36). The study group were divided into Nondiabetic and Diabetic patients (nondiabetic=61, diabetic=25) and followed 12 month after discharge for persisting Covid 19 symptoms. Discharge criteria are as per government of India guidelines. Data collection is done based on a standard symptoms questionnaire.

Result: 106 adult patients are enrolled in the study. Out of which in between the study there is loss to follow up of 20 cases. At 12 month 44 cases (non-diabetic) ,10 cases(diabetic) completely free from of symptoms. In symptomatics the most common persistent symptoms was fatigue -25.5% (diabetic- 40%,non diabetic- 19.7%), dyspnea 6.9% (diabetic- 16%, non diabetic- 3.2%), myalgia- 17.44% (diabetic- 20%,non diabetic-16.39%)and headache 11.62% (diabetic- 20%,non

diabetic- 8.2%). This was followed by insomnia, Joint pain, memory loss, dry cough, depression and chest pain.

Conclusion: Majority of cases are asymptomatic and in symptomatic fatigue, dyspnea, myalgia and headache were the most prevalent post-COVID-19 symptoms that experienced up to 12 months.

Keywords: SARS-CoV-2, COVID 19, CLINICAL SYMPTOMS.

Introduction

The world is at this unique junction of uncertainty regarding new COVID outbreak and its future consequences. The human population now progressing towards natural and vaccine acquired immunity and on another way there is risk of emergence of new variants of SARS-CoV-2. It is important to understand the COVID-19 disease progression and the long-term consequences of SARS-CoV-2 infection.

However, most people infected with SARS-CoV-2 experienced mild to moderate respiratory illness and recovered without the need for special treatment. But some people (especially the elderly) and those with underlying medical conditions such as diabetes, chronic respiratory disease, cardiovascular disease or malignancies are more likely to develop serious illness and need medical attention. It is also seen that anyone can get infected with SARS-COV-2 and become seriously ill or die at any stage of life. SARS-CoV-2 infection with diabetes had a high prevalence of disease severity and adverse outcome during the second wave in India and the world. This also requires the long-term monitoring and follow-up of COVID cases for consequences in survivors and high risk population for early alarming and management.

Globally, on 31 may 2021, there have been 172,974,252 confirmed cases of COVID-19, including 3,755,238 deaths, reported to WHO, while on **31 December 2022** globally 656,139,890 confirmed cases and 6,675,365 deaths.[1]

In **India**, from 3 January 2020 to 31 December 2022, there have been **44,678,384** confirmed cases of COVID-19 with **530,702** deaths, reported to WHO.[1]

As of 20 December 2022, a total of **2,200,145,981** vaccine doses have been administered worldwide.[1]

India suffered a lot more during the second wave of COVID pandemic than the first. India's dense population and high transmissibility with the mutability of SARS-CoV-2 virus also strongly put Indian population at high risk. COVID-19 has proven difficult to control compared to previous outbreaks due to numerous cluster transmission or super-spreader events, relatively limited medical resources and unavailability of rapid test kits.[2] considering the current trend of the pandemic, India is still in the second wave of infection and there is a fear that the third wave will develop. Only time will tell if India will experience the third wave of SARS-CoV-2 infection, but the findings of ongoing comparative analysis would undoubtedly spur policymakers to develop new and effective measures to lessen the severity of COVID-19 and successfully handle the second and third waves of the pandemic.[3]

In a prospective cohort study Symptoms and Health Outcomes among survivors of covid-19 infection one year after discharge from hospitals in Wuhan, China, in 2433 patients who had been hospitalized with COVID-19, the most common symptoms at 1 year after discharge were fatigue, sweating, chest tightness, anxiety, and myalgia. Patients with severe disease had more post infection symptoms and higher chronic obstructive pulmonary disease assessment test scores.[4]

In a large, international app-based cohort study, found that having more than five symptoms in the first week of an illness was associated with long COVID.[5] Long COVID is defined as the persistence of symptoms beyond 3 months after severe acute respiratory syndrome corona virus (SARS-CoV-2) infection.[6] Given Long COVID's very recent emergence, no defined standard framework has yet been established for identifying and assessing associated symptoms or other clinical indicators. Most of the studies analyzed in the systematic review utilized a survey-based approach, meaning that they were able to analyze only symptoms identified a priori as concerns.[7] These studies also differed in whether they included only previously hospitalized patients or mixed patients with mild, moderate, and severe acute COVID-19. Long COVID may follow severe or relatively mild acute illness, and it has been suggested that, as in SARS and MERS, acute illness severity influences the clinical course of long COVID.[8]

Standardized and successful follow-up studies of COVID-19 are undoubtedly invaluable in understanding epidemiology and assessing the long-term burden of COVID.[9-11]
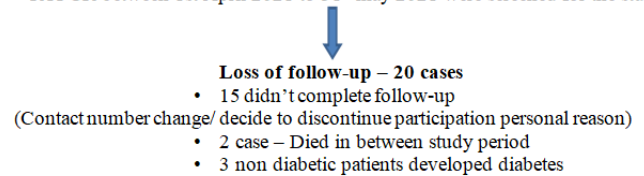
Materials and Method

A longitudinal single centre cohort study has been conducted among admitted SARS-CoV2 RTPCR positive cases, those who recovered and discharged from the tertiary care centre from 1st April 2021 to 31st May 2021.

Admission and discharge criteria were as per Government of India guidelines.[12] During enrollment in the study, real-time reverse transcriptase–polymerase chain reaction for SARS CoV-2 was performed and enrolled patients followed after a negative test results.

Study completed on number of cases, n=86 (Male = 50 , female = 36, median age = 48). For data collection predesigned standard questionnaire were used. Patients answered the standard symptom questionnaire during acute COVID-19 and at follow-up visits at 12 months. Symptoms already existing before COVID-19 onset were not included in the analysis.

Written informed consent was obtained from all subjects prior to inclusion to study.

106 admitted patients (SARS-CoV2 positive) and get discharged after negative RTPCR between 1st April 2021 to 31st may 2021 were screened for the study

Loss of follow-up – 20 cases
- 15 didn't complete follow-up
(Contact number change/ decide to discontinue participation personal reason)
- 2 case – Died in between study period
- 3 non diabetic patients developed diabetes

86 cases completed follow-up for 1 year after discharge from tertiary care centre
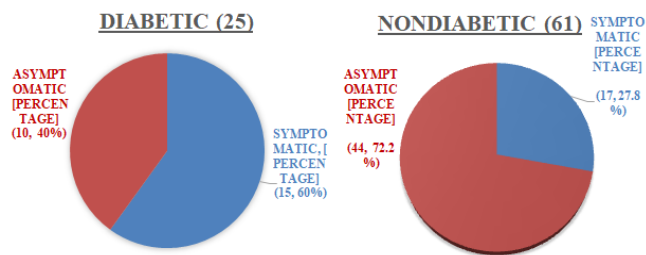
Cases studied for persisting clinical symptoms with history of pre-existing diabetes (in 25 cases) and non diabetes (in 61 cases)

Observation and Result

Covid patients(n=86)

NON SYMPTOMATIC 63%
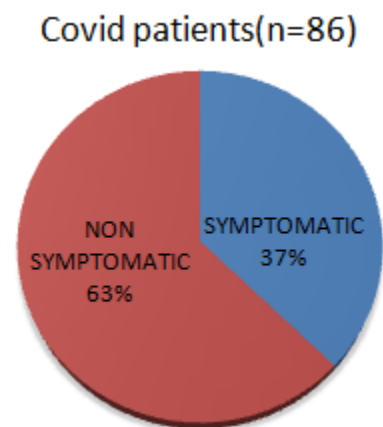
SYMPTOMATIC 37%

At the end of 12 months overall 63% patients of enrolled cases was completely free of any symptoms , in which the non-diabetic symptom free cases was 72.2% while only 40 % diabetic patients was asymptomatic.

Table -1: Findings After 1 Year Of Follow-UP (N=86)

	Symptomatic(32)	Asymptomatic(54)
Non-Diabetic(61)	17	44
Diabetic(25)	15	10

106 adult patients are enrolled in the study. Out of which in between the study there is loss to follow up of 20 cases. At 12 month 44 cases (non-diabetic) and10 cases (diabetic) are completely free from of symptoms (Table-1). And the most common persistent symptoms are **fatigue** -25.5% (diabetic- 40%,non diabetic- 19.7%), dyspnea **6.9%** (diabetic- 16%, non diabetic- 3.2%), **myalgia- 17.44%** (diabetic- 20%,non diabetic-16.39%)and headache **11.62%** (diabetic- 20%,non diabetic- 8.2%). This was followed by insomnia, Joint pain, memory loss, dry cough, depression and chest pain. Symptoms like fever, loss of appetite, loss of taste which was in the major proportion during active COVID phase were not found as persistent symptoms after 12 months.

Out of symptomatic cases, 14 patients (43.8%) reported one persistent symptom, 8 patients (25%) reported two persistent symptoms, and 10 patients (31.2%) reported three or more persistent symptoms(Table-2).

Table-2: Numbers of symptoms in individuals after one year of follow-up

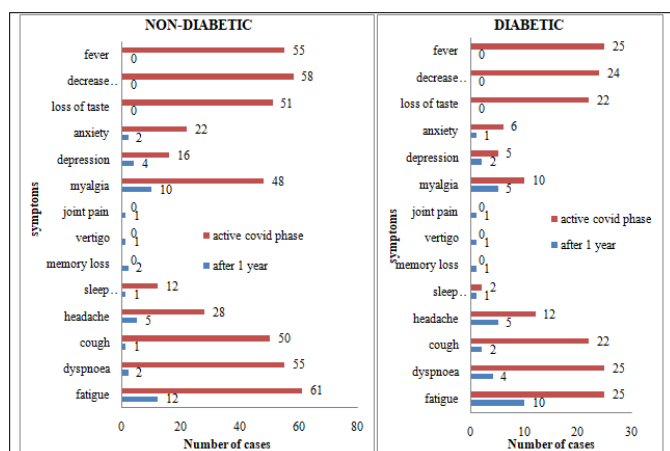|	One	Two	Three or more
Non diabetic	11	3	3
Diabetic	3	5	7

Discussion

To better understand the long-term course of symptoms and progression, we prospectively analyzed a cohort of COVID-19 patients after discharge from the tertiary care center of Sasaram. In our cohort study, the most likely symptoms to persist until 12 months were fatigue, dyspnea, myalgia, headache, and sleeping problems were major in follow up cases.

COVID-19 in long term associated with some persistent symptoms in patients with some underlying disease conditions like diabetes but overall, there are minimal impacts on health-related quality of life in the major population. Comparing COVID-19 patients with and without diabetes, our study found that patients with diabetes tended to develop more persistent symptoms as compared with non-diabetics.

In our study three subjects out of eighty six found to be newly diagnosed case of diabetes .Therefore, to accurately evaluate the effects of COVID-19 infection on newly diagnosed diseases, including diabetes, comparative studies with these controls are warranted in the future. Long-term follow-up is needed to assess whether the corona virus has diabetogenic effects in people at high risk of diabetes, or whether it can stimulate new types of diabetes.[14-15]

Diabetes has bidirectional relationship with COVID-19. A poorly controlled diabetes increases the COVID-19

severity and is also associated with increased morbidity and mortality.[16] Many studies recorded the presence of one or more symptoms in patients during long COVID.[17-21] Pre-existing diabetes with COVID-19 infection patients having more risk of long-term persistent symptoms and need post discharge care and long term monitoring.[22-24]

Limitations of our study are that it is single-centered study with a relatively small number of patients, which may limit the generalizability of the results. Long-term follow up presents several challenges in study. For example, length of follow-up, accuracy of self-report, symptoms examined, reliance on family-reported symptoms, negative PCR tests in some patients (false-negative results) and the difficulty of establishing a direct link between symptoms and infection. Also re-infection with COVID-19 after hospital discharge could not be ruled out in the study.

Longer follow-up studies in a larger population are necessary to understand the full spectrum of health consequences from COVID-19 with underlying disease and control group.

Summary and Conclusion

Majority of cases were asymptomatic and in symptomatic fatigue, dyspnea, myalgia and headache were the most prevalent post-COVID-19 symptoms that experienced up to 12 months. Covid patients with pre-existing diabetes having more risk of long-term persistent symptoms. Extensive changes have taken place globally at personal and social level during the COVID era to improve the standards of health and hygiene, but continuous follow up of symptoms improvement, new symptoms and multidisciplinary integrated research on recovered COVID-19 patients are required.

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