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Research Article

A Retrospective Study to Assess the Incidence of Post-COVID Syndrome among the Patients Discharged after COVID-19 Treatment from A Selected Hospital in New Delhi

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A B S T R A C T

Introduction: COVID-19 is a global pandemic and equally devastating are its post-infectious sequelae. Post-COVID complications are common among the patients discharged after COVID-19 infection.

Method: This was a retrospective study designed to assess the incidence of post-COVID syndrome and also seeks its association with co-morbidities and selected demographic variables among patients discharged from the Holy Family Hospital, New Delhi after treatment of COVID-19. After obtaining due approval from the authorities, 202 patients were selected as sample using purposive sampling technique. Telephonic interviews were conducted and a structured tool was used to collect data on socio-demographic variables, history of comorbidity and post-COVID syndrome from discharged post-COVID patients.

Results: The findings of study revealed that the overall incidence of post-COVID symptoms among discharged post-COVID patients was 64.25%. The incidence of post-COVID syndrome was assessed under ten different categories of which the most common symptom was fatigue (51.98%), followed by generalised body pain (50%). It was also observed that 21 patients (10.40%) had developed diabetes mellitus after recovering from COVID-19 infection. The comorbidities, i.e. diabetes mellitus ($p < 0.0021$), hypertension ($p < 0.00001$), cardiovascular disease ($p < 0.001$) and respiratory diseases ($p < 0.001$), and demographic variables such as history of smoking ($p < 0.000013$), history of alcohol ($p < 0.0031$), being vaccinated for COVID-19 ($p < 0.00001$), type of vaccine ($p < 0.001$) and number of doses of vaccination for COVID-19 ($p < 0.001$) were found to be significantly associated with post-COVID syndromes.

Conclusion: Post-COVID-19 syndrome was found to be associated with factors like history of smoking and alcohol intake, vaccination status and history of comorbidities like diabetes mellitus and hypertension.

Keywords: Post-COVID Syndrome, COVID-19, COVID Vaccine

Introduction

Although many COVID-19 patients eventually recover, some do not cease experiencing symptoms long after their COVID-19 polymerase chain reaction test turns negative. As per the guidelines by the National Institute for Health and Care Excellence (NICE), post-COVID-19 syndrome is defined as, "signs and symptoms that develop during or after an infection consistent with COVID-19, continuing for more than 12 weeks (3 months), and not explained by an alternative diagnosis."[1] The need of this study is to describe the post-infectious sequelae of COVID. This knowledge would be crucial in preventing and managing post-COVID-19 complications, and also to support the patients who are experiencing delayed morbidity and disability resulting from those complications.

Materials and Methods

This is a retrospective study. The objective of the study is to assess the incidence of post-COVID syndrome and also seek its association with co-morbidities and selected demographic variables. The population chosen for the study was post-COVID patients who were discharged from the Holy Family Hospital, New Delhi after the treatment of COVID-19. After obtaining ethical clearance and formal administrative permissions from the authorities, a pilot study was conducted from November 18 to November 23, 2021. The findings of the pilot study revealed that it was feasible to conduct the final study.

For the final study, the data collection was done from Dec 24, 2021, to Jan 15, 2022. Three hundred and sixty-eight case files were retrieved from the MRD department and telephonic calls were made, of which 211 people attended the calls. It was discovered that nine patients had died, hence rest 202 were selected as the sample by using purposive sampling technique. The consort diagram has been shown in Figure 1. Telephonic informed consent was taken from each participant of the research and the nature of the study was informed in the language of their understanding. Cronbach's alpha was used to measure the reliability of tools and it was found that the reliability of the structured questionnaire was 0.82. The structured questionnaire was designed to collect sociodemographic data, symptoms, and history of co-morbidity of post-COVID-19 patients. Data analysis was done using both descriptive and inferential statistics. The frequency and percentage distribution of sociodemographic variables and incidence of post-COVID syndrome were determined. The chi-square test was used to find a significant association of post-COVID syndrome with comorbidity and selected demographic variables.

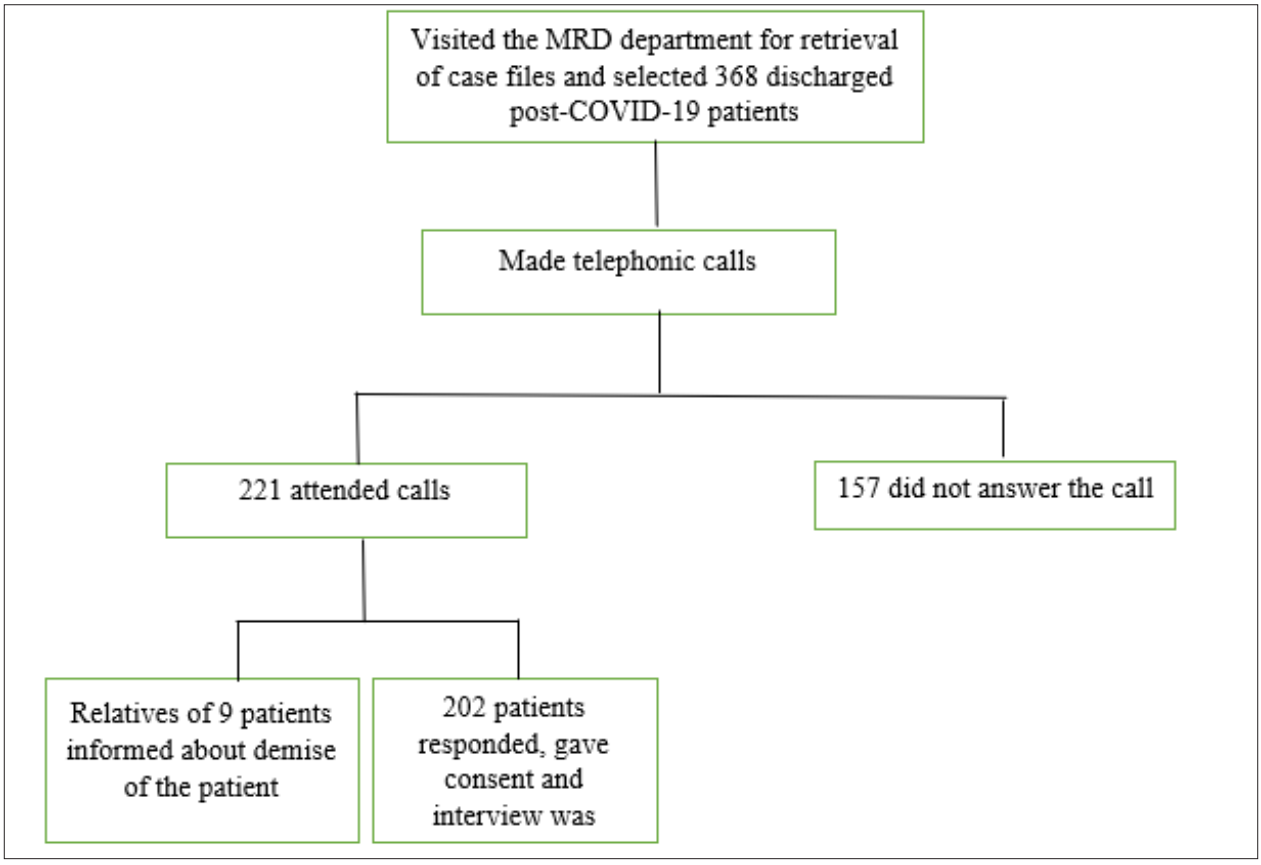

Figure 1.Consort Diagram of the Study

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Results and Discussion

Out of 202 patients, the most common age group was 46–60 years (32.17%) and nearly one-tenth of patients were aged 76 years or above. Nearly two-thirds were males (61.38%). Most patients were Hindu (43.56%) by religion. A little less than half of these patients lived in joint families (43.56%). Most patients had a monthly income of INR 40,000-60,000 (37.66%). There were 99 (49.03%) patients who had a history of smoking. It was seen that 88 (43.59%) participants had a history of alcohol intake, and 80 (39.68%) had a history of travelling. It was also observed that only around one-third of patients (38.12%) were vaccinated, of which 49 (24.25%) had taken Covaxin and 28 (13.86%) had taken Covishield. The various sociodemographic variables of the study population have been shown in Table 1.

Table 1.Frequency and Percentage Distribution of Selected Sociodemographic variables of Post COVID-19 Patients (N = 202)

Sample Characteristics	Frequency	Percentage
Age (in years)		
18–30	34	16.82
31–45	31	15.33
46–60	65	32.17
61–75	52	25.74
≥ 76	20	9.90
Gender		
Male	124	61.38
Female	78	38.61
Others	00	00
Religion		
Hindu	88	43.56
Christian	61	30.19
Muslim	48	23.76
Others	05	2.4
Educational qualification		
Can read and write	06	2.92
Primary	18	8.99
Secondary	58	28.77
Higher senior secondary	69	34.12
Graduate or above	51	25.22
Marital status		
Married	121	59.93
Unmarried	27	13.33
Divorced	19	9.42
Widow/ widower	35	17.32
Type of family		
Nuclear	73	36.12
Joint	88	43.56
Extended	41	20.27
Monthly income (in INR)		
20,000–40,000	51	25.23

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40,000–60,000	76	37.66
60,000–80,000	60	29.76
≥ 80,000	15	7.47
Area of residency		
Rural	100	49.55
Semi-urban	32	15.89
Urban	70	34.62
History of smoking		
Yes	99	49.03
No	103	50.90
History of alcohol		
Yes	88	43.59
No	114	56.42
History of travelling before COVID-19		
Yes	80	39.68
No	122	60.39
History of vaccination for COVID-19		
Yes	77	38.12
No	125	61.88

Table 2.System-wise Frequency and Percentage Distribution of Symptoms of Post-COVID Syndrome among the Post-COVID Patients (N = 202)

System	Symptoms	Frequency	Percentage
General system	Fatigue	105	51.98
	Myalgia	77	38.12
	Generalised body pain	101	50
	Loss of appetite	55	27.23
	Restlessness	28	13.86
Respiratory system	Breathlessness	81	40.10
	Cough	48	23.76
Cardiovascular system	Palpitation	63	31.19
	Heart attack	28	13.86
	Chest pain	57	28.22
Neuropsychiatric disorder	Concentration or memory deficit	11	5.44
	Insomnia	65	32.18
	Stroke	28	13.86
	Headache	48	23.76
	New-onset depression	54	26.73

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Dermatological system	Hair loss	35	17.33
	Rash	17	8.42
ENT	Loss of smell	32	15.84
	Loss of taste	39	19.31
Gastroenterological system	Abdominal pain	20	9.91
	Diarrhoea	13	6.44
	Constipation	02	0.99
	Nausea/ vomiting	03	1.49
Genitourinary system	Incontinence of urine	07	3.47
	Dribbling of urine	05	2.48
Endocrinological system	New-onset diabetes mellitus	21	10.40
Any limitation in the performance of daily living activity		110	54.46

* Significant values

Table 3.Association between History of Comorbidities and Post-COVID Syndrome (N =202)

Comorbidity		Post-COVID Syndrome		Chi-square Value	Tabulated Value at p < 0.05
		Yes	No		
Diabetes mellitus	Yes	94	30	16.907*	0.0021
	No	41	37		
Hypertension	Yes	87	28	13.665*	0.00001
	No	44	43		
Cardiovascular disease	Yes	68	19	11.876*	0.001
	No	63	52		
Respiratory disease	Yes	58	12	15.236*	0.001
	No	73	59		
Hyperthyroidism	Yes	05	02	0.1376	0.710667
	No	126	69		
Hypothyroidism	Yes	20	05	2.8723	0.090115
	No	111	66		
Autoimmune disorder	Yes	19	08	0.4164	0.518719
	No	112	63		
Bleeding disorder	Yes	07	01	1.8745	0.170957
	No	124	70		
Liver disease	Yes	10	06	0.0422	0.837331
	No	121	65		
Malignancy	Yes	11	02	2.381	0.122822
	No	120	69		

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Furthermore, the overall incidence of post-COVID syndrome was 64.82%. This high incidence of post-COVID syndrome is consistent with the results of the study of Hossain et al. which showed an incidence of 77.53%.[2] The symptoms in the present study were assessed under ten different categories. The system-wise distribution of symptoms has been shown in Table 2. Most symptoms were associated with the general system which included 105 (51.98%) patients who reported fatigue, 77 (38.12%) reported myalgia, 101 (50.00%) reported generalised body pain, and 55 (27.23%) reported loss of appetite. Breathlessness was reported as the most common respiratory symptom by 81 (40.10%) patients and 63 (31.19%) reported palpitation as the most common cardiovascular symptom. Breathlessness, cough, and fatigue were also found to be the common symptoms in a study done by Song et al.[3] Other common symptoms included concentration or memory deficit and headache. Insomnia was reported by 65 (32.18%) patients and 48 (23.8%) patients had headaches. New-onset depression was also a common symptom observed in post-COVID patients. Depression was assessed using the CES-D scale and it was observed that 54 (26.73%) patients developed new-onset depression. Interestingly, it was also observed that 21 patients (10.40%) developed new-onset diabetes mellitus after COVID-19 infection.

Table 4.Association between Post-COVID Syndrome and the Selected Demographic Variables (N = 202)

Selected Demographic Variables		History of Post-COVID Syndrome		Chi-square Value	Tabulated Value at p < 0.05
		Yes	No		
Age (in years)	18-30	16	18	7.710	0.103
	31-45	21	10		
	46-60	47	18		
	61-75	36	16		
	≥ 76	11	09		
Gender	Male	80	44	0.0158	0.899833
	Female	51	27		
	Others	0	0		
History of smoking	Yes	79	20	19.0284*	0.000013
	No	52	51		
History of alcohol	Yes	67	21	8.7116*	0.00316
	No	64	50		
History of vaccination for COVID-19	Yes	20	57	82.5089*	0.00001
	No	111	14		
Type of vaccination for COVID-19	None	111	14	82.639*	0.001
	Covaxin	12	37		
	Covishield	8	20		
Number of doses of vaccination for COVID-19	None	111	14	84.034*	0.001
	I dose	16	52		
	II dose	4	5		

* Significant values

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The comorbidities which were significantly associated with the post-COVID syndrome were diabetes mellitus (χ^2 = 16.907; p = 0.002), hypertension (χ^2 = 13.665; p = 0.00001), previous history of cardiovascular disease (χ^2 = 11.876; p = 0.001) and previous history of respiratory disease (χ^2 = 15.236; p = 0.001) as shown in Table 3. Hypertension was also shown to be an important comorbidity significantly associated with post-COVID syndrome in a similar study.[4] There also exists a significant association between post-COVID syndrome and history of respiratory support during hospitalisation for COVID-19 (χ^2 = 12.768; p = 0.005). It was also observed that there was a significant association between post-COVID syndrome and severity of COVID-19 (χ^2 = 3.888; p = 0.0488).

The sociodemographic variables shown in Table 4 which were significantly associated with post-COVID syndrome were history of smoking (χ^2 = 19.0284; p = 0.000013), history of alcohol intake (χ^2 = 8.7116; p = 0.00316), and history of vaccination (χ^2 = 82.5089; p = 0.00001). The results are consistent with the study done by Jackson et al. which showed that the history of smoking is significantly associated with post-COVID syndrome.[5]

Conclusion

Post-COVID syndrome is a common sequelae in patients who have recovered from COVID and it affects nearly two-thirds of the patients. It is mostly associated with generalised symptoms like myalgia or fatigue, although it may affect other systems as well. The presence of comorbidities like diabetes mellitus, hypertension, and respiratory and cardiovascular diseases does increase the likelihood of post-COVID syndrome. Patients who had severe COVID-19 illness or who required oxygen support during hospitalisation also were more likely to have post-COVID syndrome after they had recovered from the primary disease. It was also found that patients with a history of smoking or alcohol intake are at a higher risk of developing post-COVID syndrome. It appears that vaccination does prevent the risk of post-COVID syndrome.

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Conflict of Interest: None

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