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GAUGING THE EMERGENCE OF COMORBID DISEASES IN SUBJECTS FOLLOWING COVID-19

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ABSTRACT

Background: COVID-19 has posed high concerns concerning the development of cardiovascular and respiratory, mortality and morbidity in the affected subjects. Subjects with previous cardiovascular diseases are at higher risk of hospital acquired adverse outcomes and severe infections.

Aim: The present study was aimed to assess the characteristics and prevalence of comorbidities in subjects following the COVID-19.

Methods: The study assessed 110 subjects from both the gender and mean age of 54.4±11.2 years with the previous history of the COVID-19 infection to assess the assess the characteristics and prevalence of comorbidities in subjects following the COVID-19. The data gathered were analyzed statistically using the SPSS software.

Results: The most common comorbidity in subjects with COVID-19 was arterial hypertension seen in 54.5% (n=60) subjects followed by obesity in 33.63% (n=37) subjects, coronary heart disease in 18.1% (n=20) subjects, and congestive heart failure in 11.8% (n=13) study subjects. Less common comorbidities recorded were chronic obstructive pulmonary disease, atrial fibrillation and chronic kidney disease.

Conclusion: The present study helps in better understanding of the characteristics and prevalence of comorbidities in subjects following COVID-19 infection which has a vital role in depicting the adequate strategies for managing these comorbidities and to attain better clinical outcomes. The results of present study depict the vital role of management and identification of comorbidities in subjects affected with COVID-19 to decrease the risk associated with severity of COVID-19.

Keywords: Cardiovascular Disease, Comorbidity, COVID-19, Hypertension, MSCT (Multi-Slice Computed Tomography), Respiratory Discomfort

INTRODUCTION

The COVID-19 pandemic has imposed a significant challenges and burden on the healthcare personnel globally concerning the rapid diagnosis of the infections caused by the novel coronavirus in development of effective modalities to prevent secondary infections, implementation of rehabilitation programs, and providing the specialized medical care. After the emergence of COVID-19, globally, healthcare professionals are working to discuss and gather knowledge concerning its treatment, clinical features, and epidemiology.[1,2]

Considering the data from 2021, the reported data showed more than 230 million confirmed cases of COVID-19 worldwide with considered higher number of subjects that are either unreported or asymptomatic. It is vital to understand the long-term impacts following COVID-19 and to develop various effective modalities to manage the subjects after COVID-19 infection.[3] However, many challenges of therapeutic importance may still remain unsolved. When the symptoms and signs of COVID-19 remains for more than 12 weeks with no other cause being identified, is known as post-COVID syndrome. Post- COVID syndrome has a high effect on quality of life in affected subjects focusing on the need for creation of new treatment strategies or optimizing the existing strategies based on the standards and algorithms.[4]

The most common comorbidity and concern associated with COVID-19 disease is its marked effect of the cardiovascular system concerning both mortality and morbidity. COVID-19 infection can increase the severe infection risk in subjects with pre-existing cardiovascular disease and also predispose subjects for developing cardiovascular diseases.[5] Also, in subjects with pre-existing cardiovascular disease, hospital acquired adverse outcomes and severe infection risks. Considering the magnitude and spread rate of highly infectious virus, it is equally vital to understand the long-term impact of COVID-19 infection.[6]

The present clinical study was aimed to assess the characteristics and prevalence of comorbidities in subjects following the COVID-19 and to assess features in the post-morbid stage.

MATERIALS AND METHODS

The present clinical study was aimed to assess the characteristics and prevalence of comorbidities in subjects following the COVID-19 and to assess features in the post-morbid stage. The study population was taken from the subjects visiting the Outpatient Department of General Medicine and Chest Medicine of the Institute.

The study assessed 110 subjects from both the genders with the previous history of confirmed diagnosis of COVID-19. The subjects were enrolled for the study after minimum 4 months of COVID pneumonia onset. The study included subjects within the age range of 21-72 years and the mean age of 54.4±11.2 years. There were 49.09% (n=54) males and 50.9% (n=56) females in the present study. The degree of lung damage in all the subjects was assessed using the MSCT (multi-slice computed tomography). Based on the degree of lung damage, the subjects were divided into 4 categories namely mild, moderate, severe, and very severe comprising of 50% (n=55), 27.2% (n=30), 20% (n=22), and 2.72% (n=3) study subjects respectively.

After final inclusion of the study subjects, detailed history was recorded for all the subjects followed by recording of the data for the study. The data concerning the prevalence and incidence of comorbid

conditions were assessed from all the included subjects followed by the necessary investigations for the study.

The data gathered were analyzed statistically using the SPSS software version 21.0 and with Student's t-test and Pearson correlation coefficient. The data were noted in Microsoft excel for the assessment and statistical analysis. The study assessed for non-parametric and parametric indicators of COVID-19. The data were expressed in mean and standard deviation. The level of significance was kept at p-value of <0.05.

RESULTS

The present clinical study was aimed to assess the characteristics and prevalence of comorbidities in subjects following the COVID-19 and to assess features in the post-morbid stage. The study assessed 110 subjects from both the genders with the previous history of confirmed diagnosis of COVID-19. The study assessed 110 subjects from both the genders with the previous history of confirmed diagnosis of COVID-19. The subjects were enrolled for the study after minimum 4 months of COVID pneumonia onset. The study included subjects within the age range of 21-72 years and the mean age of 54.4±11.2 years. There were 49.09% (n=54) males and 50.9% (n=56) females in the present study.

The most common comorbidity in subjects with COVID-19 was arterial hypertension seen in 54.5% (n=60) subjects followed by obesity in 33.63% (n=37) subjects, coronary heart disease in 18.1% (n=20) subjects, and congestive heart failure in 11.8% (n=13) study subjects. Less common comorbidities recorded were chronic obstructive pulmonary disease, atrial fibrillation, and chronic kidney disease. The prevalence of comorbidities in subjects following COVID-19 are summarized in Table 1. Atrial defibrillation was seen in 3.63% (n=4) study subjects. Chronic kidney disease, diabetes mellitus, and COPD was all reported in 5.45% (n=6), 12.72% (n=14), and 3.63% (n=4) study subjects respectively (Table 1).

On assessing the various symptoms of the disease in study subjects, it was seen that at 3 months follow-up, anosmia/ageusia, chest pain, cough, heartbeat, high blood pressure, dyspnea, and weakness was reported by 1.81% (n=2), 4.54% (n=5), 8.18% (n=9), 11.8% (n=13), 18.1% (n=20), 29% (n=32), and 31.8% (n=35) study subjects respectively, whereas, at 6 months follow-up, anosmia/ageusia, chest pain, cough, heartbeat, high blood pressure, dyspnea, and weakness was reported by 0.94% (n=1), 2.83% (n=3), 3.77% (n=4), 5.66% (n=6), 18.86% (n=20), 17.92% (n=19), and 23.58% (n=25) study subjects respectively as shown in Table 2.

Concerning the new diseases that were recorded in the study subjects post COVID-19, arterial hypertension was most common comorbid disease recorded at both 3 months and 6 months follow-up in 2.72% (n=3) and 2.83% (n=3) study subjects respectively followed by congestive heart failure in 1.81% (n=2) and 1.88% (n=2) study subjects respectively. Diabetes mellitus was recorded in 1.81% (n=2) subjects at 3 months and 0.94% (n=1) subject at 6 months follow-up. Ischemic heart disease was recorded in 0.90% (n=1) and 1.88% (n=2) subjects at 3- and 6-months follow-up. Atrial fibrillation and myocardial infarction were both seen in 1 subject each at 3 months and 6 months follow-up. Stroke and atrial fibrillation were seen in 1 subject each at 3 months follow-up, whereas, at 6 months follow-up, stroke was seen in 1 subject and in no subject at 6 months. CKD (chronic kidney disease) at 3 months, were seen in 0.90% (n=1) subject and no subject at 6 months as depicted in Table 3.

DISCUSSION

The present clinical study was done to assess the characteristics and prevalence of comorbidities in subjects following the COVID-19 and to assess features in the post-morbid stage. The study assessed 110 subjects from both the genders with the previous history of confirmed diagnosis of COVID-19. The study assessed 110 subjects from both the genders with the previous history of confirmed diagnosis of COVID-19. The subjects were enrolled for the study after minimum 4 months of COVID pneumonia onset. The study included subjects within the age range of 21-72 years and the mean age of 54.4±11.2 years. There were 49.09% (n=54) males and 50.9% (n=56) females in the present study. These data were similar to the studies by Venkatesan P[7] in 2021 and Liu PP et al[8] in 2020 where authors assessed subjects with demographic data comparable to the present study.

The study results showed that the most common comorbidity in subjects with COVID-19 was arterial hypertension seen in 54.5% (n=60) subjects followed by obesity in 33.63% (n=37) subjects, coronary heart disease in 18.1% (n=20) subjects, and congestive heart failure in 11.8% (n=13) study subjects. Less common comorbidities recorded were chronic obstructive pulmonary disease, atrial fibrillation, and chronic kidney disease. Atrial defibrillation was seen in 3.63% (n=4) study subjects. Chronic kidney disease, diabetes mellitus, and COPD was all reported in 5.45% (n=6), 12.72% (n=14), and 3.63% (n=4) study subjects respectively. These results were consistent with the studies of Arutyunov GP et al[9] in 2021 and Stahlberg M et al[10] in 2021 where authors reported similar prevalence of various comorbidities in their study subjects.

It was also seen that concerning the various symptoms of the disease in study subjects at 3 months follow-up, anosmia/ageusia, chest pain, cough, heartbeat, high blood pressure, dyspnea, and weakness was reported by 1.81% (n=2), 4.54% (n=5), 8.18% (n=9), 11.8% (n=13), 18.1% (n=20), 29% (n=32), and 31.8% (n=35) study subjects respectively, whereas, at 6 months follow-up, anosmia/ageusia, chest pain, cough, heartbeat, high blood pressure, dyspnea, and weakness was reported by 0.94% (n=1), 2.83% (n=3), 3.77% (n=4), 5.66% (n=6), 18.86% (n=20), 17.92% (n=19), and 23.58% (n=25) study subjects respectively. These results were in agreement with the findings of Johansson M et al[11] in 2021 and Ayoubkhani D et al[12] in 2021 where authors reported similar symptoms of COVID-19 in their study subjects as reported by the results of the present study.

On assessing the new diseases that were recorded in the study subjects post COVID-19, arterial hypertension was most common comorbid disease recorded at both 3 months and 6 months follow-up in 2.72% (n=3) and 2.83% (n=3) study subjects respectively followed by congestive heart failure in 1.81% (n=2) and 1.88% (n=2) study subjects respectively. Diabetes mellitus was recorded in 1.81% (n=2) subjects at 3 months and 0.94% (n=1) subject at 6 months follow-up. Ischemic heart disease was recorded in 0.90% (n=1) and 1.88% (n=2) subjects at 3- and 6-months follow-up. Atrial fibrillation and myocardial infarction were both seen in 1 subject each at 3 months and 6 months follow-up. Stroke and atrial fibrillation were seen in 1 subject each at 3 months follow-up, whereas, at 6 months follow-up, stroke was seen in 1 subject and in no subject at 6 months. CKD (chronic kidney disease) at 3 months, were seen in 0.90% (n=1) subject and no subject at 6 months. These results were in line with the results of Huang C et al[13] in 2021 and Gunster C et al[14] in 2021 where authors reported the occurrence of similar new comorbidities in subjects of their studies as in the present study.

CONCLUSION

Considering its limitations, the present study helps in better understanding of the characteristics and prevalence of comorbidities in subjects following COVID-19 infection which has a vital role in depicting the adequate strategies for managing these comorbidities and to attain better clinical outcomes. The results of present study depict the vital role of management and identification of comorbidities in subjects affected with COVID-19 to decrease the risk associated with severe COVID-19.

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TABLES

Diagnosis of comorbidities	Percentage (%)	Number (n)
COPD	3.63	4
Diabetes mellitus	12.72	14
Chronic kidney disease	5.45	6
Atrial fibrillation	3.63	4
Congestive heart failure	13	11.8
Coronary artery disease	20	18.1
Obesity	33.6	37
Arterial hypertension	54.55	60

Table 1: Distribution of various comorbidities following COVID-19 in the study subjects

Symptoms	3 months		6 months	
	N=110	%	N=106	%
Ageusia/anosmia	2	1.81	1	0.94
Chest pain	5	4.54	3	2.83
Cough	9	8.18	4	3.77
Heart beat	13	11.8	6	5.66
High B. P	20	18.1	20	18.86
Dyspnea	32	29	19	17.92
Weakness	35	31.8	25	23.58

Table 2: Symptoms Persistent following hospitalization in the study subjects

Disease	3 months		6 months	
	N=110	%	N=106	%
Stroke	1	0.90	0	0
Diabetes mellitus	2	1.81	1	0.94
CKD	1	0.90	0	0
Atrial fibrillation	1	0.90	1	0.94
CHF	2	1.81	2	1.88
Myocardial infarction	1	0.90	1	0.94
Ischemic heart disease	1	0.90	2	1.88
Arterial hypertension	3	2.72	3	2.83

Table 3: Newly diagnosed comorbid diseases in study subjects post COVID-19