

Post COVID Complications among COVID-19 Patients Admitted at a Tertiary Care Hospital

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Abstract: ***Background:** The World Health Organization (WHO) stated Coronavirus disease 2019 as a pandemic. In patients with COVID-19 undergoing surgery, high rates of postprocedural mortality and complications have been noted, but systematic characterisation of hospitalised patients with COVID-19 is lacking. The aim of this present study was to study post COVID complications among COVID-19 patients admitted at a Tertiary Care Hospital. **Material & Methods:** The research design selected for this study is cross sectional observation study and conducted in Manik Hospital, Aurangabad during 1st March 2021 to 31st August 2021. Patient of who completed more than three months of diagnosis of COVID-19 of both genders of age more than 18 years. **Observation & Results:** In present study out of 997 COVID-19 patients, maximum patients i.e. 298 (29.9%) were from age-group of 51-60 years, 176 (17.7%) were age-group of 61-70 years and only 14 (1.4%) of patients were from age-group of 11-20 years. The mean age of patients was 56.62±16.29 years. The male 673 (67.5%) predomance than female 324 (32.5%). 31.5% of patients reported any one complication, Systemic 28.9%, Respiratory 9.1%, Renal 8.9%, Cardiovascular 6.7%, Gastrointestinal (including liver) 5.6% and Neurological 2.7% of patients. 63.6% of patients required oxygen and 32.2% of patients required ventilator support. 3.9% of death was reported in this study. **Conclusion:** Present study reported complications in patients of COVID-19. The adequate of provision of follow-up clinics for those who have sustained in-hospital complications such as acute kidney injury or respiratory tract infection. Beyond the short term, further work is undertaken to establish the consequences of these complications and whether these are transient or linked to worse long-term outcomes.*

Keywords: COVID-19, Complications, Renal, Respiratory

1. Introduction

Coronavirus disease 2019 (COVID-19) is a new infectious disease that was first discovered in Wuhan, China, on the 31st December 2019 [1]. It has subsequently spread to almost all countries around the world. According to the latest report by the World Health Organization COVID-19 disease has spread to 210 countries and territories around the world, and 2 international conveyances [2]. The World Health Organization (WHO) stated Coronavirus disease 2019 as a pandemic on March 11, 2020. The etiology for Coronavirus disease 2019 is a newly identified virus called SARS-CoV-2 [3]. Individuals infected with the virus can transmit to a healthy person mainly through droplets discharged from the nose and mouth [4]. The mortality rate of patients infected with SARS-CoV-2 that require hospital admission ranges between 3% and 88%, being higher in those admitted to the ICU [6, 7]. The main characteristics of patients who develop severe COVID-19 are older age, male, obesity, and several comorbid conditions [8].

A substantial proportion of patients with COVID-19 go on to develop critical illness and require organ support. It is widely recognised that survival following critical illness is accompanied by a substantial burden of additional physical and mental health morbidity that cannot be measured by mortality outcomes [9, 10]. Mortality has been widely used as an outcome in epidemiological studies and randomised controlled trials for patients with COVID-19 but fails to capture the immediate short-term health issues faced by survivors, including in-hospital complications and functional outcomes. In patients with COVID-19 undergoing surgery, high rates of postprocedural mortality and complications have been noted, but systematic characterisation of

hospitalised patients with COVID-19 is lacking [11]. In other non-SARS-CoV 2 viral illnesses, for example influenza, short-term complications such as myocardial infarction, acute kidney injury, and stroke are common and can cause greater morbidity than the initial infection itself.

In COVID-19, due to unrestrained proinflammatory cytokines increase, endothelial activation along with constant hypercoagulable process resulting in progressive pulmonary micro embolism which is suggestive of acute arterial hypoxemia shown by abnormal ABG analysis [12]. As carbon dioxide (CO₂) diffuses about 20 times more rapidly through tissues than oxygen (O₂), compensatory response of the body towards hypoxemia causes increased minute ventilation leading to uncontrolled hypocapnia [13, 14]. There is an uncanny emergence of clinical pattern with incongruity between relatively well preserved lung compliance and a severely compromised pulmonary gas exchange, leading to fatal “happy hypoxemia” without pronounced hypercapnia, and hence no corresponding signs of respiratory distress. Mechanical ventilation is required as lung compliance is affected due to arterial hypoxemia which is one of the chief complications of COVID-19. An astute perception of pathophysiological predictors of respiratory drive and hypoxemia may lead to complete comprehension of COVID-19 clinical presentation at bedside with the help of ABG analysis [12]. Preliminary studies from China & Italy suggest high mortality and concentrated ICU capacity [14].

Understanding which patients develop short-term complications might also allow clinicians and researchers to develop care pathways and interventions to mitigate the impact of complications. As many patients with COVID-19

are critically unwell, identifying the burden of short-term morbidity could be useful to understand the long-term burden on health-care systems and society for those who survive COVID-19. The aim of this present study was to describe the post COVID complications among COVID-19 patients admitted at a Tertiary Care Hospital.

2. Material and Methods

Research Design: The research design selected for this study is cross sectional observation study.

Settings of the Study: This study was conducted in Manik Hospital, Aurangabad.

Period of Study: The study was conducted during 1st March 2021 to 31st August 2021.

Sampling Technique: Cases were selected using universal sampling.

Inclusion and Exclusion Criteria:

Inclusion criteria:

- Patient of who completed more than three months of diagnosis of COVID-19 of both genders of age more than 18 years.
- Only those recovered COVID-19 patients enrolled in the study agree to give the informed consent for participation in study.

Study Population: The population for this study includes diagnosed cases Manik Hospital of Aurangabad City.

Sample size: A total of 997 patients.

Approval for the study was obtained from the Institutional Ethical Committee of Manik Hospital, Aurangabad [MS].

Methodology

After getting ethical permission from ethics committee data was collected from COVID-19 patients. For the purpose of data collection a detailed proforma was prepared. The proforma was included demographic profile (Name, age, sex and BMI), Personal history, comorbidity and symptom profile who were satisfying inclusion and exclusion criteria of study.

Assessment tools

Demographic Data: Demographic variables will be recorded on pre-designed Performa. In that Name, age, sex, address, education, COVID status, duration of treatment was recorded.

Personal history, comorbidity and symptom profile. The second section comprised of questions related to patient's admission history in hospital due to COVID-19, smoking

history, comorbidity profile including hypertension, diabetes, heart disease, asthma/COPD, chronic kidney disease (CKD) and cancer, and a list of symptoms that might occur or persists after COVID-19.

Statistical Analysis: Data was compiled in MS-EXCEL Sheet and for analysis of this data SPSS (Statistical package for social sciences) Version 25th was used. Qualitative data was represented by frequency and percentage and quantitative data was represented by mean and SD.

Table 1: Distribution of patients according to Demographic profile of patients

		No. of patients	Percentage
Age-Group	10-20	14	1.4
	21-30	31	3.2
	31-40	147	14.8
	41-50	133	13.3
	51-60	298	29.9
	61-70	176	17.7
	71-80	150	15.1
	>80	48	4.9
	Total	997	100%
Mean±SD		56.62±16.29 years	
Gender	Male	673	67.5
	Female	324	32.5
Area of Living	Rural	278	27.8
	Urban	719	72.2

In present study out of 997 COVID-19 patients, maximum patients i. e.298 (29.9%) were from age-group of 51-60 years, 176 (17.7%) were age-group of 61-70 years and only 14 (1.4%) of patients were from age-group of 11-20 years. The mean age of patients was 56.62±16.29 years. The male 673 (67.5%) predominance than female 324 (32.5%). Majority of the patients i. e.719 (72.2%) were urban and 278 (27.8%) were from rural area.

Table 2: Distribution of patents according to Symptoms and Signs at time of Admission

	No. of patients (n=997)	Percentage
Fever	589	59.1
Cough	493	49.4
Breathlessness	428	42.9
weakness	467	46.8
loss of smell taste	419	42.1
Headache	207	20.8
Tachycardia	93	9.4
Bodyache	352	35.3
Pedal oedema	34	3.5
Hyperglyceama	280	28.1
Hypoxia	73	7.4
Throat Pain	56	5.7
Seizures	03	03.0
Vomiting	146	14.7

Majority of patients were reported fever 589 (59.1%), weakness 467 (46.8%), cough 493 (49.4%), Breathlessness 428 (42.9%), loss of smell taste 419 (42.1%), Bodyache 352 (35.3%), Hyperglyceama 280 (28.1%), Vomiting 146 (14.7%), Tachycardia 93 (9.4%), Hypoxia 73 (7.4%), Throat Pain 56 (5.7%).

Table 3: Distribution of patents according to Co-morbidities

Co-morbidities	No. of patients (n=997)	Percentage
Hypertension	487	48.8
Diabetic Mellitus	314	31.5
Hypothyroidism	172	17.3
COPD	227	22.8
POST PTCA	50	5.01
Asthama	89	8.9
AIDS	3	0.3
IHD	31	3.1
CKD	56	5.6

In present study majority of COVID-19 patients reported Co-morbidities Hypertension 487 (48.8%), Diabetic Mellitus 314 (31.5%), COPD 227 (22.8%), Hypothyroidism 172 (17.3%), Asthama 89 (8.9%), CKD 56 (5.6%), Post PTCA 50 (5.01%), IHD 31 (3.1%) and AIDS 3 (0.3%).

Table 4: Distribution of patents according to Organ-specific complications

Organ-specific complications	No. of patients (n=997)	Percentage
At least one complication	314	31.5
Systemic	287	28.9
Renal	89	8.9
Gastrointestinal (including liver)	56	5.6
Cardiovascular	67	6.7
Neurological	27	2.7
Respiratory	91	9.1

In this study, (31.5%) of patients any one complication 314 (31.5%), Systemic 287 (28.9%), Respiratory 91 (9.1%), Renal 89 (8.9%), Cardiovascular 67 (6.7%), Gastrointestinal (including liver) 56 (5.6%) and Neurological 27 (2.7%).

Table 5: Age-group and Gender of patients With Complications (n=997)

		At Least one Complication (n=314)	Respiratory (n= 91)	Other Systemic (n=287)	Renal (n=89)	Neurological (n=27)	Cardiac (n=67)	Endocrin Ological (n=93)
Gender	Male	202 (64.3%)	57 (62.6%)	159 (55.4%)	57 (66.3%)	17 (65.2%)	43 (72.9%)	79 (84.9%)
	Female	112 (35.7%)	34 (67.4%)	128 (44.6%)	29 (32.7%)	10 (34.8%)	24 (27.1%)	14 (15.1%)
Age - Group	≤20	00	00	03 (1.0%)	00	00	00	00
	21-30	04 (1.3%)	01 (1.1%)	14 (4.9%)	01 (1.1%)	00	00	02 (2.1%)
	31-40	08 (2.6%)	02 (2.2%)	13 (4.5%)	04 (4.5%)	01 (3.7%)	01 (1.5%)	00
	41-50	31 (9.8%)	08 (8.8%)	39 (13.6%)	09 (10.1%)	04 (14.8%)	07 (10.4%)	08 (8.6%)
	51-60	54 (17.2%)	11 (12.1%)	59 (20.5%)	11 (12.3%)	05 (18.5%)	25 (37.3%)	28 (30.1%)
	61-70	77 (24.5%)	20 (21.9%)	66 (22.9%)	23 (25.8%)	06 (22.2%)	14 (20.9%)	26 (27.9%)
	71-80	92 (29.3%)	29 (31.7%)	64 (22.3%)	19 (21.3%)	08 (29.6%)	11 (16.4%)	19 (20.4%)
	>80	38 (18.5%)	20 (21.9%)	29 (10.1%)	22 (24.7%)	03 (11.1%)	09 (13.4%)	10 (10.7%)

Having at least one complication was common in male as compared to female. Also respiratory, Other Systemic, renal, neurological, cardiac and endocrinological were also more common in male as compared female. The incidences of complications were increasing with age of subjects. Also As least one complication, respiratory, Other Systemic, renal, neurological, cardiac and endocrinological were more common in more than age of 60 years of age.

Table 5: Distribution of patents according to Requirement of Oxygen & Ventilator

		No. of patients (n=997)	Percentage
Requirement of Oxygen	Yes	634	63.6
	NO	363	36.4
Ventilator Support [n=634]	Yes	204	32.2
	NO	430	67.8

Out of 997, 634 (63.6%) of patients required oxygen and 204 (32.2%) of patients required ventilator support.

Table 6: Distribution of patents according to Mortality

	No. of patients	Percentage
Death	39	3.9
Discharged	958	96.1
Total	997	100%

Out of 997 patients, 39 (3.9%) of patients were died and 958 (96.1%) were discharges from the hospital.

3. Discussion

COVID-19 patient's hospitalisation is required mainly in older age-group with co-morbidities. Almost half of the survivors had one or more complications, which were more likely in patients who required critical care.

In present study out of 997 COVID-19 patients, maximum patients i. e. 298 (29.9%) were from age-group of 51-60 years, 176 (17.7%) were age-group of 61-70 years and only 14 (1.4%) of patients were from age-group of 11-20 years. The mean age of patients was 56.62 ± 16.29 years. Also Drake, TM et al [15] reported majority of 27.2% of patients from age-group of 80-89 years, 22.6% of patients from age-group of 70-79 years and only 2.0% of patients from 19-29 years.

In present study, male 673 (67.5%) predominance than female 324 (32.5%). Similar finding were noted by Drake, TM et al [15] 56.0% were male and 44.0% were female. Helen Saul et al [16] found (56%) participants were men. Males appear to be more prone to severe COVID-19 than females, with resultant higher mortality rates. This could be due to biological differences between males and females whereby women have been reported to have more robust innate immune responses than males. Alternatively or in addition, differences in health seeking behaviours may play a role since it is well established that females tend to be more conscientious about their health and seek healthcare more than males [17].

In present study majority of patients were reported fever 589 (59.1%), weakness 467 (46.8%), cough 493 (49.4%), Breathlessness 428 (42.9%), loss of smell taste 419 (42.1%), Bodyache 352 (35.3%), Hyperglycaemia 280 (28.1%), Vomiting 146 (14.7%), Tachycardia 93 (9.4%), Hypoxia 73 (7.4%), Throat Pain 56 (5.7%).

In this present study, (31.5%) of patients any one complication, Systemic (28.9%), Respiratory (9.1%), Renal (8.9%), Cardiovascular (6.7%), Gastrointestinal (including liver) (5.6%) and Neurological (2.7%). Where as Helen Saul et al [16] found that the most common complications were: Renal in one in four people (24%), Respiratory (related to lungs but not typical of COVID-19) in almost one in five (18%), Systemic in one in six (16.3%). Other complications were slightly less common. Cardiovascular complications affected 12%, gastrointestinal complications 11%, and neurological complications 4% of people. Drake TM et al [15] suggests that 49.7% of patients admitted with COVID-19 have at least one in-hospital complication. Kevin John et al [18] in review report found that the most commonly involved systems were renal (24.3%), respiratory (18.4%), cardiovascular (12.3%), neurological (4.3%) and gastrointestinal (0.8%). Therefore, it is essential to recognize that COVID-19 is not just a respiratory illness, rather a multi-system disease that requires multi-disciplinary care.

4. Conclusion

This present study conclude that the male predominance than female. Majority of patients were from age group more than 60 years. 31.5% of patients reported any one complication, Systemic 28.9%, Respiratory 9.1%, Renal 8.9%, Cardiovascular 6.7%, Gastrointestinal (including liver) 5.6% and Neurological 2.7% of patients. 63.6% of patients required oxygen and 32.2% of patients required ventilator support. 3.9% of death were reported in this study. The adequacy of provision of follow-up clinics for those who have sustained in-hospital complications such as acute kidney injury or respiratory tract infection. Beyond the short term, further work is undertaken to establish the consequences of these complications and whether these are transient or linked to worse long-term outcomes. Data on long-term health difficulties posed by COVID-19 will be of great importance, COVID-19 survivors come from working age groups. This should be considered on a policy level in terms of return to work, it could have effects on individual behaviour around perceived benefits of engaging with preventive measures including vaccination.

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