Scientific Eminence Group

Research Article

Open Access

Journal of Micribiology and Bacteriology Research

jmbr@scientificeminencegroup.com

Retrospective Analysis of Demographic and Clinical Profile of Covid Positive Patients Admitted To a Tertiary Care Hospital for Future Preparedness

Ashok Arbat*

KRIMS Hospitals, 275, Central Bazar Road, Ramdaspeth, Nagpur-440010, India

*** Corresponding Author**

Ashok Arbat, KRIMS Hospitals, 275, Central Bazar Road, Ramdaspeth, Nagpur-440010, India, Tel: +9822466640, E-mail: ashok_arbat@yahoo.com

Citation

Ashok Arbat (2025) Retrospective Analysis of Demographic and Clinical Profile of Covid Positive Patients Admitted To a Tertiary Care Hospital for Future Preparedness. J Microbiol Bacteriol Res 1: 105

Publication Datess

Received date: July 06, 2025
Accepted date: July 24, 2025
Published date: July 31, 2025

Abstract

Aim: We hereby present a retrospective analysis of clinical data collected from the coronavirus disease (COVID) positive patients admitted to our Centre for treatment.

Method: Demographic and clinical characteristics such as age, gender, symptoms, hospital stay, CT score, O2 requirement, comorbidities, treatment, and outcome were tabulated and analyzed. Statistical analysis was performed on total admissions and wave 1 data was compared with wave 2.

Result: Total 804 COVID-positive patients admitted to our center were included for quantitative analysis. The majority of patients were above 50 years of age. The most common symptoms were weakness (58.6%), cough (55.3%), breathlessness (50.4%), and fever (49.3%). The mean hospital stay was 6 days. As per CT value/score patients were categorized into mild (32.8%), moderate (27.4%) and severe (15.2%). There were 78.35 % patients requiring O2 support. Hypertension (37.6%) and Diabetes mellitus (26.7%) were the two major comorbidities. Remidesivir (78%), Fabiflu/ Favipiravir (64%), and Solumedrol (62%) were the major drugs given for the treatment. The number of patients in both waves was approximately the same, however, there was a 17.2% decrease in the number of older patients and an increase in female patients in wave 2. Length of hospital stay and mortality was directly proportional to age, male gender, O2 requirement, severe CT score, and in patients suffering from Diabetes Mellitus (DM), and Hypertension (HT).

Conclusion: Elderly patients and patients with risk factors such as DM and HT should take preventive measures against COVID infection. Our study shows that they have the worst prognosis.

Abbreviations:

coronavirus disease (COVID)
CT – Computed Tomography
O2 – Oxygen
Diabetes Mellitus (DM)
Hypertension (HT)
WHO – World Health Organization
RT-PCR – Reverse Transcriptase Polymerase Chain Reaction
HRCT – High Resolution Computed Tomography
IPD – inpatient department
SPSS - statistical package for the social sciences
IBM – International Business Machines
USA – United States of America
SD - standard deviation
BiPAP - bilevel positive airway pressure
HFNO- High-flow nasal oxygen
FM - face mask
CI – Confidence Interval
IHD - ischemic heart disease
COPD - Chronic Obstructive Pulmonary Disease
PTCA - Percutaneous transluminal coronary angioplasty
US – United States

Keywords: COVID; Comorbidities; Pandemic waves

Introduction

In late December 2019, coronavirus disease – 2019 (COVID-19) emerged in Wuhan and spread to most parts of China [1–3]. There was rapid spread of this virus to the whole world with high mortality rate and thus, it was declared a pandemic by WHOM. The clinical spectrum of patients with COVID-19 appears to be varied, like asymptomatic infection, mild upper respiratory tract illness, and severe viral pneumonia with respiratory failure and even death [4–7]. Although there are case series and research articles that have been published, yet information about COVID-19 is still unfolding with the rapidly mutating COVID-19 virus [8]. The present study aims at exploring the clinical characteristics of patients with different outcomes that might provide evidence for risk stratification and help to improve clinical practices and reduce fatality. Both wave 1 and wave 2 data were also compared and presented here.

Method

Data Source

We conducted a retrospective study focusing on patients who were diagnosed with COVID-19 admitted between July 2020 to August 2021 at our centre. All patients were RT-PCR positive and were hospitalised at our centre. Improvement of clinical profile was the major determinant for discharge of the patients. The study was approved by our hospital's ethics committee in the month of July 2020 and it was conducted in accordance with the Declaration of Helsinki. Informed consent from patients were taken.

Study design and participants

exclusion criteria: patients below 18 years old, patients with negative RT-PCR results, discharge to another centre,

Inclusion criteria: Patients above 18 years old, with HRCT scan, RT-PCR positive for COVID, inpatient department (IPD) patients.

Overall Patient distribution and analysis

A total of 1763 adult patients were diagnosed COVID positive out of which 804 patients were admitted between June 2020 and June 2021 wherein, from June 2020 to February 2021 were considered to be in the first wave and from March 2021 to June 2021 in the second wave. Patient's demographics and clinical characteristics such as age, gender, symptoms, hospital stay, CT score, O2 requirement and treatment outcome were tabulated and analysed. All patients were categorised age-wise in five groups viz., ≤ 30, 31-40, 41-50, 51-60 and >60. Comorbidities, duration of hospital stay and mortality were considered as risk factors. list of various medications and mode of O2 given to patients were noted down. Risk of hospital stay and mortality associated with different factors were compared and analysed.

CT score categorisation [9]

CT score of all the patient was tabulated and its severity was categorized into three types viz., mild (1-5), moderate (6-14) and severe (15-25).

Statistics analysis

The data was analysed by statistical package for the social sciences (SPSS) version 26.0 of IBM Corporation, Armonk USA. Multiple regression analysis, Pearson's Chi-square test, t-test for independent samples, and One-way analysis of variance were done for different analysis. *p* Values <0.05 indicate that the difference was statistically significant. We used descriptive statistics to report patient demographic characteristics, including mean ± standard deviation age, proportion of male and female patients, and individuals with COVID infection detected during the first wave and second wave of the pandemic. Comparisons of outcomes (*i.e.,* hospitalization, O2 requirement and death) between first and second COVID wave were statistically analysed.

Results

Baseline Information

The mean age of the 804 total hospitalised total patients was 53.83 with standard deviation (SD) 15.27 years. Percentage of male patients were greater than females. Mean age of males was 53.82 ±14.86 years and that of females was 53.84 ± 16.07 years. Maximum number of patients were elderly (> 60). At the time of admission patients showed specific symptoms with reference to COVID. Weakness was noted among maximum number of patients whereas, headache was the least. Hypertension (HT) was found in 37.6% patients while Diabetes mellitus (DM in 26.7%. Proportion of Patients with both the conditions was 16.17%. Computed Tomography (CT) was done in 75.4% cases, while in rest it was not performed as these patients were critically ill and could not be shifted to radiology department. 78.35% patients required oxygen support which was provided by Nasal canula to maximum number of patients followed by Ventilator bilevel positive airway pressure (BiPAP), High-flow nasal oxygen (HFNO), face mask (FM) and Invasive. Patients were treated majorly with Remdesivir (78.7%), and Solumedrol (78.0%). 92% patients got recovered and were subsequently discharged.

Table 1: Distribution of patients according to various characteristics at presentation

(Abbreviation: IHD = Ischemic heart disease, COPD = Chronic Obstructive Pulmonary Disease, PTCA = Percutaneous transluminal coronary angioplasty, ILD = Interstitial Lung Disease)

Characteristics	Category	Statistic (%)
Age in years [n (%)]	<=30	48 (6.0)
	31-40	137 (17.0)
	41-50	143 (17.8)
	51-60	199 (24.8)
	> 60	277 (34.5)
Sex [n (%)]	Male	535 (66.5)
	Female	269 (33.5)
Smoker [n (%)]	NO	784 (97.5)
	YES	20 (2.5)
Alcohol [n (%)]	NO	758 (94.3)
	YES	46 (5.7)
Hospital stay (days) [Mean (SD); Median]		7.45 (6.52); 6.00
Symptom [n (%)]		
	Weakness	471 (58.6)
	Cough	445 (55.3)
	Breathlessness	405 (50.4)
	Fever	396 (49.3)
	Fever with chills	219 (27.2)
	Body ache	169 (21)
	Loss of appetite	135 (16.8)
	Sputum production	107 (13.3)
	Headache	100 (12.4)

CT category [n (%)]	Mild	264 (32.8%)
	Moderate	220 (27.4%)
	Severe	122 (15.2%)
	Not done	198 (24.6%)
	Total	804 (100%)
Comorbidities [n (%)]	Hypertension	302 (37.6)
	Diabetes	215 (26.7)
	Hypothyroidism	46 (5.7)
	IHD	43 (5.3)
	Asthma	31 (3.9)
	COPD	9 (1.1)
	PTCA	9 (1.1)
	ILD	4 (0.5)

Comparison of age, sex, hospital stay, CT score categorisation, and oxygen requirement with outcome

The proportion of death in all age groups and gender wise death rate was statistically analysed using Pearson's Chi-square test wherein < 50 years category were significantly higher (p value is < 0.0001) than > 50 years category. it was found that the mortality in males was significant and statistically higher than that of females (p value = 0.044). Descriptive statistics for hospital stay according to outcome was performed using t-tests for independent samples. The mean hospital stay of patients with mortality was significantly higher (p value = 0.003) than those who survived. Comparison of CT score categorisation with patient outcome was done using Pearson's Chi-square test. The association of CT score category at presentation and outcome was statistically significant (p < 0.0001). The proportion of mortality in severe category was significantly higher. Comparison of oxygen requirement and patient outcome done using Pearson's Chi-square test showed statistically significant result. The mortality in patients requiring oxygen support was significantly higher than those not requiring the support (p = 0.002)

Correlation between risk of hospital stay associated with different factors.

Hospital stay was defined dichotomously as: ≤ 6 days and >6 days, considering the median hospital stay of 6 days. Table 2 provides the unadjusted risk of event, associated with levels of different factors. As regards age, the risk of event associated with 51-60 years and > 60 years were 2.34 [95% confidence interval (CI): 1.56-5.09; p=0.018] and 2.97 [95% CI: 1.49 – 6.38; p=0.002] respectively, as compared to baseline age category ≤30 years, suggesting significantly higher risk of hospital stay > 6 days for these age groups, as compared to reference age group. The presence of only DM and only HT had associated risk levels of 1.63 [95% CI: 0.99-2.66; p=0.046] and 1.59 [95% CI: 1.10-2.30; p=0.012] respectively, as compared to those without these comorbidities. Those with presence of both DM and HT had significantly increased risk of hospital stay > 6 days with odds ratio (OR) of 2.07 [95% CI: 1.39-3.07; p=0.0002], as compared to those without any comorbidity. Regarding CT score at admission, those in moderate CT category had 1.27 [95% CI: 0.87-1.86; p < 0.0001] times higher risk of hospital stay > 6 days, as compared to mild category patients. Further, for patients in severe category, the risk of event was 7.12 [95% CI: 4.39-11.88; p<0.0001] times higher than the mild patients.

Also, the adjusted risk associated with different levels of factors was obtained using multiple logistic regression, as shown in the table 2. It shows that presence of both DM and HT significantly increases the risk of hospital stay more than 6 days by OR of 1.73 [95% CI: 1.08-2.74; p=0.021], as compared to those without any comorbidities. Moreover, for patients with severe CT category at admission had 7.32 [95% CI: 4.41-12.14; p<0.0001] times higher risk of event as compared to patients with mild category.

Table 2: Unadjusted and adjusted risk of hospital stay associated with different factors

(Event is hospital stay > 6 days; Bold p-values indicate statistical significance; *Obtained using multiple regression analysis); abbreviation: OR = Odds ratio, CI = confidence interval, HT = Hypertension, DM = Diabetes Mellitus, OAD = Obstructive Airway Disease,

Factor	Levels	Unadjusted			Adjusted*	
		Event/Total (%)	OR [95% CI]	P-value	OR [95% CI]	P-value
Age in years	<=30	11/48 (22.9)	1.00		1.00	
	31-40	42/137 (30.6)	1.49 [0.71 - 3.34]	0.295	1.25 [0.56 - 2.79]	0.592
	41-50	47/143 (32.9)	1.68 [0.80 - 3.75]	0.168	1.15 [0.51 - 2.59]	0.731
	51-60	81/199 (40.7)	2.34 [1.56 - 5.09]	0.018	1.44 [0.65 - 3.17]	0.367
	> 60	129/277 (46.6)	2.97 [1.49 - 6.38]	0.002	1.89 [0.86 - 4.15]	0.113
Sex	Male	208/535 (38.9)	1.00		1.00	
	Female	102/269 (37.9)	0.96 [0.71 - 1.29]	0.792	1.02 [0.73 - 1.43]	0.893
Comorbidities						
HT and DM	None	136/422 (32.2)	1.00		1.00	
	Only DM	35/80 (43.8)	1.63 [0.99 - 2.66]	0.046	1.52 [0.89 - 2.59]	0.119
	Only HT	72/167 (43.1)	1.59 [1.10 - 2.30]	0.012	1.18 [0.77 - 1.82]	0.43
	DM+HT	67/135 (49.6)	2.07 [1.39 - 3.07]	0.0002	1.73 [1.08 - 2.74]	0.021
OAD	Yes	18/40 (45.0)	1.32 [0.69 - 2.52]	0.391	1.27 [0.64 - 2.53]	0.502
Hypothyroidism	Yes	23/46 (50.0)	1.64 [0.89 - 2.99]	0.1	1.68 [0.87 - 3.26]	0.121
CT category	Mild	84/264 (31.8)	1.00		1.00	
	Moderate	82/220 (37.3)	1.27 [0.87 - 1.86]	< 0.0001	1.32 [0.89 - 1.93]	0.163
	Severe	94/122 (77.0)	7.12 [4.39 - 11.88]	< 0.0001	7.32 [4.41 - 12.14]	< 0.0001

Correlation between risk of mortality associated with different factors.

Table 3 provides the unadjusted risk of event, associated with levels of different factors. As regards age, the risk of event associated with 51-60 years and > 60 years were 4.75 [95% CI: 0.58-167.0; p=0.03] and 7.37 [95% CI: 0.91 – 250.5; p=0.007] respectively, as compared to baseline age category ≤30 years, suggesting significantly higher risk of mortality corresponding to these age groups, as compared to reference age group. The risk of event associated with females i.e., 0.53 [95% CI: 0.27-0.97; p=0.044] was significantly lower than that of males. The presence of only DM and only HT had associated risk levels of 1.44 [95% CI: 0.46-3.75; p=0.049] and 1.79 [95% CI: 0.84-3.72; p=0.011] respectively, as compared to those without these comorbidities. Those with presence of both DM and HT had significantly increased risk of mortality with OR of 4.33 [95% CI: 2.27-8.36; p<0.0001], as compared to those without any comorbidity. Regarding CT score at admission, those in moderate CT category had 2.87 [95% CI: 1.12-8.38; p=0.024] times higher risk of mortality, as compared to mild category patients. Further, for patients in severe category, the risk of event was 8.73 [95% CI: 3.59-24.7; p<0.0001] times higher than the mild patients.

Also, the adjusted risk associated with different levels of factors was obtained using multiple logistic regression, as shown in the table 3. Females were at significantly lower risk of mortality with OR of 0.49 [95% CI: 0.25-0.97; p=0.04] as compared to males. Those with presence of both DM and HT had significantly higher risk of mortality with OR 2.14 [95% CI: 1.06-4.31; p=0.034], as compared to those without any morbidities. Moreover, for patients with moderate and severe CT category at admission had 3.17 [95% CI: 1.17-8.60; p=0.023] and 9.59 [95% CI: 3.66-25.1; p<0.0001] times higher risk of event as compared to patients with mild category, respectively.

Table 3: Unadjusted and adjusted risk of mortality associated with different factors

Event is mortality; Bold p-values indicate statistical significance; *Obtained using multiple regression analysis. (Abbreviation: OR = Odds ratio, CI = confidence interval, HT = Hypertension, DM = Diabetes Mellitus, OAD = Obstructive Airway Disease)

			Unadjusted		Adjusted*	
Factor	Levels	Event/Total (%)	OR [95% CI]	P-value	OR [95% CI]	P-value
Age in years	<=30	0/48	1.00		1.00	
	31-40	2/137 (1.5)	0.71 [0.08 - 37.9]	0.399	0.51 [0.04 - 5.94]	0.593
	41-50	3/143 (2.1)	1.02 [0.12 - 47.62]	0.312	0.74 [0.07 - 7.58]	0.803
	51-60	18/199 (9.0)	4.75 [0.58 - 167.0]	0.03	2.72 [0.34 - 22.01]	0.348
	> 60	37/277 (13.4)	7.37 [0.91 - 250.5]	0.007	4.57 [0.57 - 36.3]	0.151
Sex	Male	47/535 (8.7)	1.00		1.00	
	Female	13/269 (4.8)	0.53 [0.27 - 0.97]	0.044	0.49 [0.25 - 0.97]	0.04
Comorbidities						
HT and DM	None	19/422 (4.5)	1.00		1.00	
	Only DM	5/80 (6.3)	1.44 [0.46 - 3.75]	0.049	1.04 [0.36 - 3.00]	0.946
	Only HT	13/167 (7.8)	1.79 [0.84 - 3.72]	0.011	0.93 [0.43 - 2.02]	0.856
	DM+HT	23/135 (17.0)	4.33 [2.27 - 8.36]	< 0.0001	2.14 [1.06 - 4.31]	0.034
OAD	Yes	2/40 (5.0)	0.68 [0.10 - 2.33]	0.543	0.44 [0.09 - 1.99]	0.288
Hypothyroidism	Yes	5/46 (10.8)	1.59 [0.53 - 3.88]	0.365	2.34 [0.76 - 7.16]	0.137
CT category	Mild	6/264 (2.3)	1.00		1.00	
	Moderate	14/220 (6.4)	2.87 [1.12 - 8.38]	0.024	3.17 [1.17 - 8.6]	0.023
	Severe	21/122 (17.2)	8.73 [3.59 - 24.7]	< 0.0001	9.59 [3.66 - 25.1]	< 0.0001

Comparison of patient characteristics between first and second wave of covid-19

Table 4 shows statistically significant difference in the gender wise distribution of first and second wave. A higher proportion of females were admitted to IPD in second wave as compared to first wave (p=0.006). Age and hospital stay showed insignificant difference between two waves.

Table 4: Descriptive statistics for patient admitted to IPD during first and second wave

*Obtained using Chi-square test; ‡Obtained using t-test for independent samples;

S: Significant; NS: Not significant. (Abbreviation: SD = Standard Deviation)

Parameter	Category	Wave		P-value
		First	Second	
Age category (years) [No. (%)]	<= 30	20 (5.0)	28 (7.0)	0.0802 (NS)*
	31 - 40	62 (15.3)	75 (18.8)	
	41 - 50	63 (15.6)	80 (20.0)	
	51 - 60	107 (26.5)	92 (23.0)	
	> 60	152 (37.6)	125 (31.3)	
Sex [No. (%)]	Male	287 (71.0)	248 (62.0)	0.006 (S)*
	Female	117 (29.0)	152 (38.0)	
Hospital-stay (in days) [Mean (SD); Median]		7.19 (7.15); 5.00	7.71 (5.83); 6.00	0.263 (NS)‡

Comparison of patient's symptoms between first and second wave.

At the time of presentation patients' symptoms were compared and statistically analysed using Chi-square test. Cough (p =0.001), Cough productive (p =0.019), running nose (p =0.009), sore throat (p =0.004), fever (p < 0.0001), weakness (p =0.003), body ache (p < 0.0001) and fatigue (p =0.0002 showed statistically significant difference of proportions between two waves (Table 5).

Comparison of patient's comorbidities between first and second wave.

Comorbidities like HT (p =0.008), ischemic heart disease (IHD) (p=0.02), Chronic Obstructive Pulmonary Disease (COPD) (p =0.019) and Percutaneous transluminal coronary angioplasty PTCA (p =0.007) showed statistically significant difference between two waves (Table 6).

Table 5: Comparison of patients with presenting symptoms between first and second wave

*Obtained using Chi-square test; S: Significant; NS: Not significant

Symptom	Wave [No. (%)]		P-value*
	First (N=404)	Second (N=400)	
Cough	201 (49.8)	244 (61)	0.001 (S)
Cough productive	65 (16.1)	42 (10.5)	0.019 (S)
Running nose	5 (1.2)	17 (4.3)	0.009 (S)
Sore throat	45 (11.1)	22 (5.5)	0.004 (S)
Fever	169 (41.8)	227 (56.8)	< 0.0001(S)
Fever with chills	120 (29.7)	99 (24.8)	0.115 (NS)
Loss of smell	8 (2)	14 (3.5)	0.187 (NS)
Headache	49 (12.1)	51 (12.8)	0.789 (NS)
Weakness	216 (53.5)	255 (63.8)	0.003 (S)
Body ache	62 (15.3)	107 (26.8)	< 0.0001 (S)
Loss of appetite	73 (18.1)	62 (15.5)	0.329 (NS)
Fatigue	2 (0.5)	18 (4.5)	0.0002 (S)
Breathlessness	200 (49.5)	205 (51.3)	0.621 (NS)
Hemoptosis	4 (1)	2 (0.5)	0.691 (NS)
Vertigo	3 (0.7)	10 (2.5)	0.089 (NS)
Pain in abdomen	15 (3.7)	10 (2.5)	0.431(NS)
Diarrhea	29 (7.2)	19 (4.8)	0.146 (NS)
Chest pain	12 (3)	11 (2.8)	0.851 (NS)

Table 6: Comparison of comorbid conditions in patients between two waves

*Obtained using Chi-square test; S: Significant; NS: Not significant. Abbreviation: HT = Hypertension, DM = Diabetes Mellitus, IHD = Ischemic heart disease, COPD = Chronic Obstructive Pulmonary Disease, PTCA = Percutaneous transluminal coronary angioplasty, ANC = ILD = Interstitial Lung Disease)

Comorbidity	Wave [No. (%)]		P-value*
	First (N=404)	Second (N=400)	
HT	170 (42.1)	132 (33.0)	0.008 (S)
DM	118 (29.2)	97 (24.3)	0.112 (NS)
IHD	29 (7.2)	14 (3.5)	0.02 (S)
Asthma	18 (4.5)	13 (3.3)	0.375 (NS)
Hypothyroidism	25 (6.2)	21 (5.3)	0.567 (NS)
COPD	8 (2.0)	1 (0.3)	0.019 (S)
PTCA	9 (2.2)	0	0.007 (S)
ANC	2 (0.5)	4 (1.0)	0.673 (NS)
ILD	4 (1.0)	0 (0.0)	0.135 (NS)

Comparison of patient's outcome with O2 requirement between the two waves

As shown in Table 7, significantly higher proportion of patients required oxygen support in second wave as compared to first wave. The mortality occurrence was insignificantly different between two waves.

Table 7: Comparison of O2 requirement and outcome in patients between two waves

*Obtained using Chi-square test; S: Significant, NS: Non-significant

Parameter		Wave [n (%)]		P-value*
		First wave (N=404)	Second (N=400)	
O2 need	No	100 (24.8)	46 (11.5)	< 0.0001 (S)
	Yes	304 (75.2)	354 (88.5)	
Mortality	No	371 (91.8)	373 (93.3)	0.444 (NS)

Discussion

We have done clinical and demographic studies of COVID patients admitted at our hospital.

Among these patients, cumulatively more males were admitted than females. Several studies have reported that male patients are more susceptible to COVID as well as they experience severe course of disease followed by fatal outcome.[10] In our study population, females were at significantly lower risk of mortality with OR of 0.49 [95% CI: 0.25-0.97; p =0.04] as compared to males. Even though the number of females admitted to our centre increased in wave 2 than wave 1 but in comparison to males it was far less (in both waves). In one study of 5319 patients, a very high mortality risk for seniors, was reported [11]. In another study, about 81% deaths occurred among above 60 years old patients [12]. The association of age and COVID prognosis is widely studied worldwide and it was evident that its severity and mortality were profoundly increased in older patients [13]. Similar findings have been reciprocated in our study.

COVID has an estimated incubation period [14] of 5.1 days and within 11.5 days of its onset the patients start developing its symptoms. Major symptoms present in COVID patients are cough, fever, shortness of breath and less common symptoms are anosmia, nausea, sore throat, diarrhoea, myalgias, malaise, anorexia, headache [15]. As reported by stokes et al, [16] in US, out of 373,883 confirmed symptomatic patients, 70% showed cough, fever and shortness of breath, hence are major symptoms. On the other hand, minor symptoms were headache and myalgia. In our study, at the time of admission, weakness, cough, breathlessness, fever, body ache (myalgia), loss of appetite, sputum production, and headache were the common symptoms. Our results are similar to the studies reported by other centres [17]. Loss of smell and taste was present in only few patients. This is contrary to the earlier reports and World Health Organisation (WHO) released information regarding common symptoms of COVID patients [18, 19].

Coronavirus mainly enters the humans through respiratory tract and it in turn leads to respiratory distress, severe pneumonia, fibrosis and respiratory failure too [20-22]. CT severity score plays major role in diagnosis and management of COVID-19 disease [23]. HRCT findings are of major importance in predicting the progression of the disease and severity was is categorised into mild, moderate and severe groups [24] Even though mild and moderate CT score of our patients were more in number than severe group, the demand for oxygen requirement was much higher in these patients. The association of CT score category at presentation and outcome was statistically significant (p < 0.0001) as the proportion of mortality in severe category was significantly higher. In severe cases, the alveoli get damaged [25] due to inflammatory response caused by the viral infection that progressively increase the oxygen demand. As there is limited oxygen exchange, it leads to acute respiratory distress leading to respiratory failure and in worst conditions death depending upon the severity of the disease. Autopsy reports of COVID patients by different study groups have revealed pulmonary thromboembolic effects causing death of the patients [26-30]. One of the most important factors is monitoring of oxygen requirement among

COVID patients. In our study groups, 78.35% patients required oxygen support. It was provided by nasal canula in nearly 90% cases. The association of oxygen requirement and outcome was statistically significant in our study. The mortality in patients requiring oxygen support was significantly higher than those not requiring the support. Also, the length of hospital stay was longer in oxygen requiring group since those patients were critically ill. Decreased blood oxygen saturation is one of the typical findings of COVID, [31] and it is associated with poor prognosis. In severe patients, the oxygen saturation was less than 94% and thus giving oxygen support is one of the key requirements.

HT and DM were the most prevalent comorbidities present in patients admitted to our centre. we have found a statistically significant result and correlation between history of DM and HT among COVID-19 patients with that of CT severity score.

Comparison of age, sex, hospital stay, CT score categorisation, and oxygen requirement was done with outcome (death). Statistically significant relationship was observed between variation of age, gender, incidence of DM and HT when compared to mortality. The results demonstrated that old age, male gender, and existence of DM and HT among COVID-19 patients were more among expired patients. Similar reports were in line with these findings that HT and DM were the most predominant comorbidities in COVID patients [32-36]. There is a meta-analysis which exhibited an increased mortality rate in males [37]. According to one of the studies, COVID mortality in diabetic patients were more than non-diabetic patients as it exponentially worsens the prognosis [38]. Interestingly, in our study, we have found that COVID patients suffering from both DM and HT, the outcome worsened leading to increased mortality rate. There are elevated cases of hospitalisation of patients suffering from these comorbidities. [39, 40] It is now evident from our findings that DM and HT either alone or together plays a pivotal role in making the patient critically ill and their subsequent death. This condition indicates to an important prospect that clinicians have to keep in mind. Extra care and keen observation are needed while treating these COVID patients in this specific group.

We observed distinct differences in characteristics and outcomes between wave 1 and wave 2 of the pandemic. In wave 2, higher number of female populations were hospitalised at our centre, however, there was insignificant difference when compared for age and hospital stay. The percentage of total patients admitted to our centre in both wave 1 (50.25%) and wave 2 (49.75%) were almost same. Age distribution of the patients has shown that there is increase in patients < 50 years of age by 17.2% and decrease in >50 years age group by 9.8%. We can state that number of younger patients were affected more in wave 2 than wave 1 while there was a small decline in the hospitalization of elderly. This could be attributed to the fact that older patients were vaccinated for COVID and there was awareness among common people to protect them by following the guidelines and effective treatments were available on the basis of wave 1 experience. [41] The incidence of cough, running nose, fever, weakness, body ache and fatigue has increased in the second wave as compared to first wave and the differences are statistically significant too. There was a drop in certain symptoms like sputum production, sore throat and fever with chills in wave 2. Fever, fatigue and body ache were remarkably more in wave 2 patients. The number of patients admitted to our centre in wave 2 has shown lowered HT cases and the difference was found statistically significant. Similarly, lesser number of DM patients were admitted in wave 2 than wave 1. Significantly higher proportion of patients required oxygen support in second wave as compared to first wave. The recovery rate of patients was 91.8 and 93.3 percentage in wave 1 and wave 2 respectively. This is to mention that our centre being a referral centre had to handle and manage severe COVID patients. As the severity and distress was chronic, recovery was delayed. Recovery rate would have been better if patients were referred earlier to our centre. At the end, in lieu of our findings, it was observed that effective management of severe COVID cases is possible by providing quick diagnosis and rendering correct treatment regime which varies with patient's clinical conditions.

Conclusion

This retrospective analysis COVID patients with different severity demonstrated that older age, male gender, moderate and severe CT score, comorbidities like DM and HT alone and both in an individual are prominent factors associated with hospital stay and mortality. Thus, patients with comorbidities should be given prompt treatment to avoid complications and mortality. The clinicians and physicians should keep on monitoring clinical conditions time to time to regulate and escalate treatment strategies to mitigate the number of fatalities in the COVID pandemic.

References

1. Zhu H, Wei L, Niu P (2020) The novel coronavirus outbreak in Wuhan, China. Glob Health Res Policy 5: 6.

2. Wua Y, Chena C, Chan Y (2020) The outbreak of COVID-19: An overview. J Chin Med Assoc 83: 217-20.

3. Singhal T (2020) A Review of Coronavirus Disease-2019 (COVID-19). Indian J Pediatr 87(4): 281-6.

4. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. (2020) Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 395: 497-506.

5. Yang X, Yu Y, Xu J, et al. (2020) Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. Lancet Respir Med 8: 475-81.

6. Grasselli G, Zangrillo A, Zanella A, Antonelli M, Cabrini L, Castelli A, et al. (2020) Baseline characteristics and outcomes of 1591 patients infected with SARS-CoV-2 admitted to ICUs of the Lombardy Region, Italy. JAMA 323: 1574-81.

7. Mehta P, McAuley DF, Brown M, Sanchez E, Tattersall RS, Manson JJ, et al. (2020) HLH across Speciality Collaboration, UK COVID-19: consider cytokine storm syndromes and immunosuppression. Lancet 395:1033-34.

8. SeyedAlinaghi S, Mirzapour P, Dadras O, Pashaei Z, Karimi A, MohsseniPour M, et al. (2021) Characterization of SARS-CoV-2 different variants and related morbidity and mortality: a systematic review. Eur J Med Res 26: 51.

9. Aziz-Ahari A, Keyhanian M, Mamishi S, Mahmoudi S, Bastani EE, Asadi F, et al. (2022) Chest CT severity score: assessment of COVID-19 severity and short-term prognosis in hospitalized Iranian patients. Wien Med Wochenschr 172: 77-83.

10. Alhumaid S, Al Mutair A, Al Alawi Z, Al Salman K, Al Dossary N, Omar A, et al. (2021) Clinical features and prognostic factors of intensive and non-intensive 1014 COVID-19 patients: an experience cohort from Alahsa, Saudi Arabia. Eur J of Med Res 26: 1-13.

11. Li H, Wang S, Zhong F, Bao W, Li Y, Liu L, et al. (2020) Age-dependent risks of incidence and mortality of COVID-19 in Hubei Province and other parts of China. Front Med (Lausanne) 7: 190.

12. CDC COVID-19 Response Team. Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) - United States, February 12-March 16, 2020. MMWR Morb Mortal Wkly Rep 69:343-6.

13. Yanez ND, Weiss NS, Romand JA, Treggiari MM (2020) COVID-19 mortality risk for older men and women. BMC Public Health 20: 1742.

14. Lauer SA, Grantz KH, Bi Q, Jones FK, Zheng Q, Meredith HR, et al. (2020) The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases: Estimation and Application. Ann Intern Med 172: 577-82.

15. Raveendran AV, Jayadevan R, Sashidharan S (2021). Long COVID: An overview. Diabetes Metab Syndr 15:869-75.

16. Stokes EK, Zambrano LD, Anderson KN (2020) Coronavirus Disease 2019 Case Surveillance - United States, January 22-May 30, 2020. MMWR. Morb. Mortal Wkly Rep 69:759-65.

17. Elliott J, Whitaker M, Bodinier B, Eales O, Riley S, Ward H, et al. (2021) Predictive symptoms for COVID-19 in the community: REACT-1 study of over 1 million people. PLoS Med 18: 1003777.

18. Dawson P, Rabold EM, Laws RL, Conners EE, Gharpure R, Yin S, et al. (2021) Loss of taste and smell as distinguishing symptoms of coronavirus disease 2019. Clin Infect Dis 72:682-5.

19. Sampaio Rocha-Filho PA, Albuquerque PM, Carvalho LCLS, Dandara Pereira Gama M, Magalhães JE, Et al. (2022) Headache, anosmia, ageusia and other neurological symptoms in COVID-19: a cross-sectional study. J Headache Pain 23:2.

20. Rahimi B, Vesal A, Edalatifard M (2020) Coronavirus and Its effect on the respiratory system: Is there any association between pneumonia and immune cells. J Family Med Prim Care 9: 4729-35.

22. Hu B, Guo H, Zhou P, Shi ZL (2021) Characteristics of SARS-CoV-2 and COVID-19. Nat Rev Microbiol 19: 141-54.

23. Al-Mosawe AM, Abdulwahid HM, Fayadh NAH (2021) Spectrum of CT appearance and CT severity index of COVID-19 pulmonary infection in correlation with age, sex, and PCR test: an Iraqi experience. Egypt J Radiol Nucl Med 52: 40.

24. Saeed GA, Gaba W, Shah A, Al Helali AA, Raidullah E, Al Ali AB, et al. (2021) Correlation between Chest CT Severity Scores and the Clinical Parameters of Adult Patients with COVID-19 Pneumonia. Radiol Res Pract 2021: 6697677.

25. Guan W-jie, Ni Z-yi, Hu Y, Liang Wen-hua, Ou Chun-quan, He Jian-xing, et al. (2020) Clinical characteristics of coronavirus disease 2019 in China. N Engl J Med Overseas Ed 382: 1708-20.

26. Yang X, Yu Y, Xu J, Shu H, Xia J, Liu H, et al. (2020) Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. Lancet Respir Med 8: 475-81.

27. Grasselli G, Zangrillo A, Zanella A, Antonelli M, Cabrini L, Castelli A, et al. (2020) Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy. JAMA 323: 1574-81.

28. Mehta P, McAuley DF, Brown M, Sanchez E, Tattersall RS, Manson JJ, et al. (2020) HLH Across Speciality Collaboration UK COVID-19: consider cytokine storm syndromes and immunosuppression. Lancet 395:1033-4.

29. Konopka KE, Nguyen T, Jentzen JM, Rayes O, Schmidt CJ, Wilson AM, et al. (2020) Diffuse alveolar damage (DAD) resulting from coronavirus disease 2019 Infection is Morphologically Indistinguishable from Other Causes of DAD. Histopathology 77: 570-8.

30. Maiese A, Manetti AC, La Russa R, Di Paolo M, Turillazzi E, Frati P, et al. (2021) Autopsy findings in COVID-19-related deaths: a literature review. Forensic Sci Med Pathol 17:279-96.

31. Böning D, Kuebler WM, Bloch W (2021) The oxygen dissociation curve of blood in COVID-19. Am J Physiol Lung Cell Mol Physiol 321: 349-57.

32. Ng WH, Tipih T, Makoah NA, Vermeulen JG, Goedhals D, Sempa JB, et al. (2021) Comorbidities in SARS-CoV-2 Patients: a Systematic Review and Meta-Analysis. mBio 12: 03647-20.

33. Guan WJ, Liang WH, Zhao Y, Liang HR, Chen ZS, Li YM, et al. (2020) Comorbidity and its impact on 1590 patients with COVID-19 in China: a nationwide analysis. Eur Respir J 55: 2000547.

34. Wang B, Li Ruobao Li, Zhong Lu, Huang Y (2020) Does comorbidity increase the risk of patients with COVID-19: evidence from meta-analysis. Aging 12: 6049-57.

35. Sanyaolu A, Okorie C, Marinkovic A, Patidar R, Younis K, Desai P (2020). Comorbidity and its Impact on Patients with COVID-19. SN Compr Clin Med 2: 1069-76.

36. Richardson S, Hirsch JS, Narasimhan M, Crawford JM, McGinn T, Davidson KW, et al. (2020) Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized With COVID-19 in the New York City Area. JAMA 323: 2052-59.

37. Peckham H, de Gruijter NM, Raine C, Radziszewska A, Ciurtin C, Wedderburn LR, et al. (2020) Male sex identified by global COVID-19 meta-analysis as a risk factor for death and ITU admission. Nat Commun 11: 6317.

38. de Almeida-Pititto B, Dualib PM, Zajdenverg L, Dantas JR, de Souza FD, Rodacki M. et al. (2020) Brazilian Diabetes Society Study Group (SBD). Severity and mortality of COVID 19 in patients with diabetes, hypertension and cardiovascular disease: a meta-analysis. Diabetol Metab Syndr 12: 75.

39. Sanyaolu A, Okorie C, Marinkovic A, Patidar R, Younis K, Desai P, et al. (2020) Comorbidity and its Impact on Patients with COVID-19. SN Compr Clin Med 2: 1069-76.

40. Liu B, Spokes P, He W, Kaldor J (2021). High risk groups for severe COVID-19 in a whole of population cohort in Australia. BMC Infect Dis 21: 685.

41. Kumar G, Mukherjee A, Sharma RK, Menon GR, Sahu D, Wig N, et al. (2021) National Clinical Registry for COVID-19 Team (2021) Clinical profile of hospitalized COVID-19 patients in first & second wave of the pandemic: Insights from an Indian registry based observational study. Indian J Med Res 153: 619-28.

Supplementary Table

Table A: Comparison of age, sex, CT score categorisation, oxygen requirement and descriptive statistics for hospital stay according to patient's outcome

A. Comparison of age with outcome			
		Death	
		NO	YES
Age category (years)	<=30	48	0
	31-40	135	2
	41-50	140	3
	51-60	181	18
	>60	240	37
B. Comparison of sex with outcome			
		Death	
		NO	YES
Sex	Female	256 (95.2)	13 (4.8)
	Male	488 (91.2)	47 (8.8)
X. Descriptive statistics for hospital stay according to outcome			
		Death	
		NO	YES
Hospital Stay	N	744	60
	Mean	7.25	9.88
	Median	5.00	7.00
	Std. deviation	6.22	9.13
Δ. Comparison of CT score categorisation with patient outcome			
CT category		Death	
		NO	YES
Not done		179 (90.4)	19 (9.6)
Mild		258 (97.7)	6 (2.3)
Moderate		206 (93.6)	14 (6.4)
Severe		101 (82.8)	21 (17.2)
E. Comparison of oxygen requirement and patient outcome			
		Death	
		NO	YES
O2 requirement	NO	144 (98.6)	2 (1.4)
	YES	600 (91.2)	58 (8.8)