ORIGINAL RESEARCH PAPER

General Medicine

CLINICAL AND DEMOGRAPHIC PROFILE OF COVID-19 PATIENTS ADMITTED IN A TERTIARY CARE HOSPITAL: AN EXPERIENCE OF THE SECOND WAVE

KEY WORDS: COVID-19, acute respiratory distress syndrome – comorbidities-observational

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ABSTRACT

Background and Objectives: Since its first official identification in December 2019, the COVID-19 pandemic emerged as possibly the most critical public health emergency the world has ever faced. After the brunt of the first wave in 2020, as the world was gradually limping back to normalcy, the second wave hit and hit hard. In this study we have studied the clinical characteristics of the patients with COVID-19 admitted to a tertiary care hospital in North-East India during the second wave.

Materials And Methods: In this observational study, the clinical characteristics and outcomes of patients admitted to a tertiary care hospital at Guwahati, Assam, India, from April 23 to May 31, 2021 were analyzed. All patients were diagnosed by real-time reverse transcriptase polymerase chain reaction (RT-PCR) on throat and/or nasopharyngeal swabs. The admitted patients were managed as per Government of Assam protocol for management of COVID-19.

Results And Observations: In this study we have enrolled 691 patients. The history of contact with COVID-19-affected individuals was available in 145 (20.98%) patients. The age group most commonly affected was 51-79 years with a mean age of 61.7 years and the males (64.5 %) were predominantly affected. Of the study population, 82% were symptomatic. The most common symptoms were fever (67 %), cough ((34 %), breathlessness ((37%), and 61 % patients had hypoxia (SpO2<94%) on admission.

Past history of COVID-19 infection was documented in 7 patients and 18 patients had received first dose of COVID vaccine (COVISHIELD) and 2 patients received second dose also.

Associated medical or surgical conditions were present in 361(52.24%) patients, diabetes and hypertension being the commonest. Shifting to intensive care unit (ICU) was needed in 75 patients (10.9%), and 93 (13.5%) patients were shifted to post-covid ward after testing negative for COVID-19. 33 (4.8%) patients opted for home isolation after remaining stable for minimum 3 days. Mortality of 2.7 per cent (19 patients) was recorded in the study.

The mean SPO2 in room air at the time of admission was 85.02 in the discharged group, 77.1 in the expired group, 78.3 in those shifted to ICU, 77.8 in the shifted to post-covid ward group and 94.8 in those who opted for home isolation.

The mean duration of symptoms at the time of admission was 3.3 days in the discharged group, 6.6 days in the expired group, 3.6 days in those shifted to ICU, 4.1 days in the shifted to post-covid ward group and 3.6 days in those who opted for home isolation.

Conclusion: A considerable population (n=276, 39.9%) of the patients included in our study group were elderly (51-79 years) and symptomatic (82%). 67 % of the patients had fever, 61% had respiratory symptoms and 17% had gastro-intestinal symptoms. Patients with comorbidities and low SPO2 on presentation, older age group (mean 68.1) had poor outcome. Longer duration of symptoms prior to hospitalization was associated with higher mortality in this study.

INTRODUCTION

The Covid-19 virus, that was first identified in Wuhan, China, caused a pandemic of such magnitude that made even the best healthcare infrastructure in the world appear insufficient (1). The first wave in 2020 noted that the predominant vulnerable population were the elderly and the sick. However, the second wave in early 2021 saw a shift to the younger population. This study was conducted to evaluate the clinical

and demographic profile of the patients admitted with Covid-19 infection in Gauhati Medical College (GMCH), a tertiary care hospital in Assam.

METHOD

Study Setting

The study was conducted in COVID-III Hospital, one of the dedicated Covid Hospitals of GMCH. All the patients who were RT-PCR positive for COVID-19 and were admitted in COVID-III hospital from 23rd April 2021 to 10th June 2021, were enrolled in the study.

Study Design

Cross sectional observational study.

Sample Size

A total of 691 patients, who were RT-PCR positive for COVID-19 and admitted in COVID-III Hospital of Gauhati Medical College, were enrolled in the study.

Inclusion Criteria

The patients diagnosed with Covid-19 disease as per guidelines of ICMR/MoHFW, Government of India were enrolled.

Exclusion Criteria

Those patients who were transferred to some other hospital and could not be followed up were excluded from analysis.

All patients received the standard supportive care as per Government of Assam guidelines (2) that comprised of Doxycyclin 100 mg BD for 5 days, Ivermectin 12mg BD for 5 days, Zinc 50 mg OD, Vitamin C 500 mg OD, Vitamin D 60K IU Once Weekly and Famotidine 20 mg BD. (5)

The moderate category cases, defined as SpO2<94% in room air or respiratory rate>24/min, were treated with steroid, heparin and Remdesivir. Steroid was given in the form of Dexamethasone 6 mg once daily (Intravenous or per oral) for a period of 10 days. Low molecular weight Heparin in a dose of 1mg/kg once daily subcutaneous (Or 5000 U Unfractionated Heparin subcutaneously once daily in case of patients with Chronic Kidney Disease was given for a period of 10 days.

Remdesivir was administered intravenously as a 200-mg loading dose on day1, followed by a 100-mg dose given daily on day 2-5. Remdesivir was not administered to patients who had altered liver function (AST or ALT >5 times the upper limit of normal Or patients with decompensated cirrhosis) and significant renal insufficiency (eGFR<30 ml/min) at the time of enrollment.

Monitoring

Patients were assessed at the time of hospitalization and daily thereafter during their hospitalization, from day of enrollment till the day of discharge or death.

The patient's clinical status was recorded each day in the case record defined for this study. RTPCR test for COVID-19 was repeated on day 7 or later after clinical stabilization.

Statistical Analysis

1. The age and gender distribution, mean spo2 at time of admission and during hospital stay, presence of co-morbid conditions were recorded.
2. The mean duration of symptoms at time of admission, mean duration of hospital stay, average time required to test COVID negative by RT-PCR (Viral Clearance) and the clinical outcome (discharge, death, shifted to non-COVID after testing negative but still on oxygen support, shifted to ICU and home isolation) were noted.
3. Analysis was done for possible correlation of the above noted clinical measures with the outcome of the patient.

RESULTS

Patient Recruitment

A total of 691 patients admitted in Gauhati Medical College, COVID-III Hospital, were enrolled in the study. All patients were diagnosed with RTPCR for COVID 19. All patients were closely monitored during the entire period of hospitalization for clinical improvements / deterioration.

Age Distribution

Table 1: Age Distribution

Age	No (n)	Mean	$\dot{x}\pm\mu$	Largest	Smallest	%
18-30	135	22.7	22.7±6.5	1.5	30	19.5
31-50	261	40.9	40.9±5.9	50	31	37.7
51-79	276	61.7	61.7±7.5	59	79	39.9
≥80	19	86.2	86.2±5.7	103	80	2.74
Total	691					

The majority cases were in the 51-79 years group (39.9%) followed closely by 31-50 years group (37.7%).

Gender Distribution

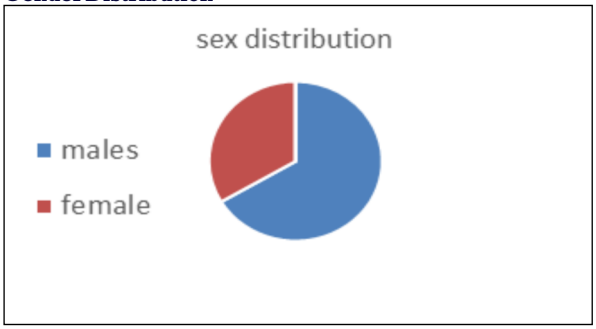

Figure 1: Sex Distribution Of The Patients Enrolled

Males constituted the majority of the cases in our study population (64.5%, n=460).

Co-morbidities In The Study Group

Table 2: Co-morbid Conditions Noted In The Study Population And Their Occurrence

Diabetes (n=)	Hypertension (n=)	Chronic kidney Disease (n=)	COPD (n=)	Malignancy (n=)	Thyroid Disorder (n=)	CAD (n=)	Obesity (n=)	Others (n=)	None (n=)
142	136	15	8	12	14	9	9	16	402
20.54 %	19.68 %	2.17 %	1.15 %	1.73 %	2.02 %	1.30 %	1.30 %	2.31 %	58.17
Others includes CLD, Fractures, Thalassemia, Parkinsonism, Psoriasis									

A significant proportion (41.83%, n=289) of the study population had associated medical or surgical conditions. Diabetes (20.54%) followed by Hypertension (19.68&) were the most frequent co-morbidity noted. Obesity (BMI>30) was seen in 1.3% cases.

Clinical Outcome

Table 2: Outcome Of The Admitted Patients

Out Come (total n=691)		
Outcome	**Number (n)**	**Percentage (%)**
Discharged	421	60.9
Deaths	19	2.7
Shifted to Post covid ward/ICU	121	17.51
Shifted to COVID ICU	75	10.85
Home isolation	33	4.77
Shifted to other hospital	22	3.18
Total	691	100.0

60.92% of the patients could be discharged successfully after testing negative for COVID-19 and were maintaining spo2 on room air. 7.95% patients who met criteria for home isolation (improved symptomatically, spo2>94% on room air, aged and had no co-morbid conditions) opted for home isolation as per State Protocol.

However, 17.51% of the cases required hospitalization even after testing negative as they were oxygen dependent and were shifted to oxygen beds in the Post-Covid ward. Another 10.85% cases deteriorated further during the hospitalization and needed to be shifted to Covid ICU for better management.

19 patients (2.7%) died during the study period.

Co-relation of outcome with different variables (age, gender, presence of symptoms, duration of onset of symptoms at time of hospitalization, spo2 on presentation. Viral clearance and duration of hospital stay).

Table 3.1: Age, Gender And Presence Of Symptoms Compared To Outcome

Sl no	Outcome (n)	Age				Sex (%)		Symptoms (%)	
		Average	SD	Min	Max	Male	Females	Yes	no
1	Discharged (421)	44.80	18.05	3	86	35.1	65.9	85.3	14.7
2	Deaths (19)	68.1	15.2	45	103	68.4	31.6	55.4	44.6
3	Shifted to ICU (75)	54.2	15.4	1.5	95	63.0	37.0	94.5	5.5
4	Shifted to post covid (121)	52	16.4	5	90	74.7	25.3	88.0	12.0
5	Home Isolation (33)	39.9	21.9	2.5	85	69.7	30.3	87.9	12.1
6	Shifted to other hospital (22)	59.8	17.4	29	90	68.2	31.8	87.0	13.0

The average age in the discharged cases was 44.80 years and 39.9 in the home isolation group. Those requiring prolonged hospitalization in post-Covid ward after testing negative had an average age of 52 years and those needing Covid ICU care had an average of 54.2 years. The cases that expired belonged to the age group 45-103 years (average 68.1).

Amongst the discharged cases majority had symptoms (85.3%). Similarly symptomatic cases were predominant in the cases sent for home isolation (87.9%), cases shifted to ICU (94.5%) and those shifted to post-Covid wards (88%). One interesting finding was 44.6% cases were asymptomatic on admission (admitted due to co-morbidities).

Table 3.2: Spo2 And Duration Of Symptoms At Presentation Compared To Outcome

		SpO2				Symptoms Duration			
	Outcome (n)	Average	SD	Min	Max	Average	SD	Min	Max
1	Discharged (421)	85.02	7.9	56	99	3.3	1.4	1	8
2	Deaths (19)	77.1	8.7	56	88	6.6	2.9	1	12
3	Shifted to ICU (75)	78.3	8.4	54	91	3.8	1.8	1	9
4	Shifted to post-Covid (121)	77.8	8.3	50	92	4.1	1.7	1	10
5	Home Isolation (33)	94.8	1.6	88	98	3.6	1.2	2	6
6	Shifted to other hospital (22)	77.8	8.1	64	91	3.6	1.5	1	7

The mean spo2 in room air was 85.02% in the discharged group and 94.8 % in the home isolation group. However, the mean spo2 on admission was very low in the expired (77.1%), shifted to ICU (78.3%) and shifted to post-Covid (77.8%) cases.

The duration of symptoms present before the cases were admitted also seemed to corelate with the outcome. It was much higher (6.6 days) in the cases that expired than the shifted to post Covid (4.1) followed by shifted to ICU (3.8), the home isolation (3.6) and the discharged (3.3) group,

Table 3.3: Viral Clearance (Days Taken To Test RTPCR Negative After Admission) And Duration Of Hospital Stay Compared To Outcome

		Viral Clearance				Hospital stay			
	Outcome (n)	Average	SD	Min	Max	Average	SD	Min	Max
1	Discharged (421)	7.9	2.9	3	19	6.6	2.6	1	15
2	Deaths (19)	-	-	-	-	3.5	3.4	1	13
3	Shifted to ICU (75)	-	-	-	-	2.9	2.4	1	11
4	Shifted to post-Covid (121)	10	4	3	32	7.1	3.3	1	17
5	Home Isolation (33)	-	-	-	-	4.03	3.1	1	13
6	Shifted to other hospital (22)	-	-	-	-	-	-	-	-

A negative test (RT-PCR) was documented only in the cases that were discharged (mean 7.9 days) and those who required to be shifted to post-Covid wards due to continued oxygen requirement (mean 10 days).

The mean duration of hospital stay was 7.1 days in the shifted to post Covid, 6.6 days in the discharged group, 4.03 in the home isolation group, followed by 3.5 in the expired group and 2.9 days in the shifted to ICU group.

Table 4: Co-morbidities Present In The Various Groups.

Outcome	Discharged (n=421)	Deaths (19)	Shifted to ICU (75)	Shifted to post covid (121)	Home Isolation (33)	Shifted to other hospital (22)
Co-morbidities present (%)	144 (34.2%)	16 (84.2 %)	41 (54.67 %)	41 (33.8%)	10 (30.3 %)	13 (5.9%)

Majority of the patients (84.2%) that expired had associated co-morbid conditions followed by those who needed ICU care (54.7). The occurrence of co-morbidities in the shifted to post-Covid group (33.8%), the home isolation group (30.3%) and the discharged group (34.2%) were comparable.

DISCUSSION

A total of 691 patients admitted in Gauhati Medical College, COVID-III Hospital, were enrolled in the study. All patients were diagnosed with RTPCR for COVID 19. All patients were closely monitored during the entire period of hospitalization for clinical improvements / deterioration.

The majority cases were in the 51-79 years group (39.9%) followed closely by 31-50 years group (37.7%). Males constituted the majority of the cases in our study population (64.5%, n=460). Mohan et al reported a mean age of 40.1±13.1 years, with 93.1% males,(3). Our study noted a higher age group that was predominantly affected.

A significant proportion (41.83%, n=289) of the study population had associated medical or surgical conditions. Diabetes (20.54%) followed by Hypertension (19.68&) were the most frequent co-morbidity noted. Obesity (BMI>30) was seen in 1.3% cases. Comorbidities were present in 23 (15.9%) patients, of which diabetes mellitus (n=16; 11.1%) was the most common (3). Our study found higher occurrence of co-morbidities.

De Souza et al found younger (median age 44 years) age group commonly (4) compared with that reported by the US and European population (median age 62 years)[5]; with less proportion of comorbid conditions (18.72%) compared with western countries (14.40%–60.10%) (6). Our findings corelates with the western data.

60.92% of the patients could be discharged successfully after testing negative for COVID-19. 7.95% patients opted for home isolation. However, 17.51% of the cases required prolonged hospitalization and were shifted to oxygen beds in the Post-Covid ward. Another 10.85% cases deteriorated and needed to be shifted to Covid ICU. 19 patients (2.7%) died during the study period. This contradicts Mohan et al who noted that only five (3.5%) patients required oxygen supplementation, four (2.8%) patients had severe disease requiring intensive care, one required mechanical ventilation and mortality occurred in two (1.4%) patients (3). Similarly, De Souza et al found that no respiratory support was required for 520 patients (97.56%) who were discharged alive, while 13 patients required some kind of respiratory support. Many western countries and the USA have reported higher requirement of admission to ICU (1%–26%), ventilation support (3%–88%) and requirement of any kind of oxygen support (1%–55%).(6.7)

The average age in the discharged cases was 44.80 years and 39.9 in the home isolation group. Those requiring prolonged hospitalization in post-Covid ward after testing negative had an average age of 52 years and those needing Covid ICU care had an average of 54.2 years. The cases that expired belonged to the age group 45-103 years (average 68.1). Our findings corelate with De Souza et al who noted that patients discharged alive were much younger (median age 38, IQR 26) compared with those with in-hospital mortality (median age 55, IQR 20). (4)

Amongst the discharged cases majority had symptoms (85.3%). Similarly symptomatic cases were predominant in the cases sent for home isolation (87.9%), cases shifted to ICU (94.5%) and those shifted to post-Covid wards (88%). One interesting finding was 44.6% cases were asymptomatic on admission (admitted due to co-morbidities). Mohan et al recorded similarly a significant proportion of patients with no symptoms (n=64; 44.4%); among the symptomatic, cough (34.7%) was the most common symptom followed by fever (17.4%) and nasal symptoms (2.15%). (3)

The mean spo2 in room air at time of admission was 85.02% in the discharged group and 94.8 % in the home isolation group. However, the mean spo2 on admission was very low in the expired (77.1%), shifted to ICU (78.3%) and shifted to post-Covid (77.8%) cases. This findings corelates with Feng et al who noted that low SpO2 (<89% in room air) significantly correlated with death event (5).

The duration of symptoms present before the cases were admitted also seemed to corelate with the outcome. It was much higher (6.6 days) in the cases that expired than the shifted to post Covid (4.1) followed by shifted to ICU (3.8), the home isolation (3.6) and the discharged (3.3) group. Larsson et al similarly found that a high median duration of symptoms preceding ICU admission as 11 (IQR 8-14) days. (8)

A negative test (RT-PCR) was documented only in the cases that were discharged (mean 7.9 days) and those who required to be shifted to post-Covid wards (mean 10 days). The mean duration of hospital stay was 7.1 days in the shifted to post Covid, 6.6 days in the discharged group, 4.03 in the home isolation group, followed by 3.5 in the expired group and 2.9 days in the shifted to ICU group. Mohan et al noted the time to RT-PCR negativity as 16-18 days (3) which was slightly higher than ours.

Majority of the patients (84.2%) that expired had associated co-morbid conditions followed by those who needed ICU care (54.7). The occurrence of co-morbidities in the shifted to post-Covid group (33.8%), the home isolation group (30.3%) and the discharged group (34.2%) were comparable. This is supported by De Souza et al who also found that higher age, gender (male) and history of any comorbidities were associated with an increased risk of dying. Having a history of hypertension was independently associated with more than twofold risk of dying. (4) Cao et al (6) found that the risk of death was higher for older patients (age greater than 50 years) and among men which is consistent with data from in-hospital mortality reported from New York City, China and Italy (7,9).

CONCLUSION

Our study provides reports of the clinical course of patients with COVID-19, admitted during April and May 2021 in a Tertiary care hospital during the second wave of COVID-19. The study noted that patients with COVID-19 are older in age, male predominant, mostly symptomatic and have higher occurrence of comorbid conditions. The mean spo2 on admission, older age and longer duration of symptoms at time of admission correlated with poor outcome.

Our study however was an observational retrospective analysis involving a relatively small sample size. To comment on the usefulness of the various parameters noted in our study, a randomized prospective study involving larger cohort in multiple centers across the state or country would be required.

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