SHORT ARTICLE

Clinical Profile of Indoor Covid-19 Patients at a Medical Institute In India: A Retrospective analysis

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Abstract

Background: COVID-19 has caused a very high burden of morbidity and mortality across the world, India being also badly affected. The disease has a wide spectrum ranging from asymptomatic to severe illness and death. Research work on the epidemiological and clinical profile of patients is scarce in India. **Objectives**: This study was conducted to know the clinico-epidemiological profile of indoor hospitalized Covid 19 patients. **Methods**: a retrospective analysis (record based) conducted at a designated COVID tertiary care center. Study period-1st August 2020 to 31st October 2020. Study Unit- Laboratory confirmed COVID 19 patients admitted in the hospital. Sample size- All the 894 patients with complete record were included in the study. **Results**: The mean age was 47.68± 17.62 years. Around 14.1% of the population was asymptomatic. 75.7% were classified as having a mild disease. The cure rate was 82.9% and deaths were reported in 9.4%. More than half of the population was having at-least one co-morbidity. **Conclusions**: Our findings were similar to findings observed in other studies. A positive significant correlation was noticed between age, duration, clinical severity and outcome of patient. The clinical severity was also found to be associated with age, duration of symptoms and outcome of patient.

Keywords

Introduction

COVID-19 was declared a pandemic by the World Health Organization(1). Till date, approximately 276 million COVID-19 cases and 5.3 million deaths have been reported to WHO(1). Currently, the surge of cases is being noticed in WHO Southeast Asia region(2). India reported 29.9 million of total confirmed cases of COVID 19 out of which approximately 3.89 lacs losing their lives with a case fatality rate of 1.3 %(3).The state of Uttar Pradesh has confirmed 1.7 million cases out of which approximately 22000 have died.(3)

Globally studies have found Covid 19 to have a wide spectrum ranging from asymptomatic to severe illness and death(4). The most common symptoms reported are fever, cough and fatigue followed by shortness of breath, and others(5-9). Presence of any co-existing diseases/ co-morbidities tend to increase the severity of disease(6).

Research works on the epidemiological and clinical profile of patients is scarce from India. Further robust research at local context is required especially regarding the clinical and epidemiological parameters to get an in-depth insight into the epidemiology. Hence this study was conceptualized to find the answer for *"what is the clinical profile of indoor hospitalized Covid 19 patients?*

Aims & Objectives

1. To describe the clinico-epidemiological profile of Covid-19 patients admitted in the Institute.
2. To determine the clinical severity of the patients at the time of presentation/ admission in the hospital and outcome of the patients.
3. To estimate whether there is an association between the clinico-epidemiological factors and clinical severity and outcome of the patients.

Material & Methods

The study is a retrospective analysis (record-based) with data-retrieval from Medical Records Department (MRD) at a tertiary care institute (a dedicated COVID health facility) in Lucknow. The study period was from 1st August 2020 to 31st October 2020 among laboratory confirmed patients admitted in the hospital during this period.

Sample Size- All the Lab Confirmed COVID 19 admitted in the Institute during the study period were included in the study. A total of 903 patients were admitted but the case records of 9 patients were found incomplete hence 894 patients with complete record were included in the study.

Inclusion Criteria- All the lab confirmed patients admitted during the study period were included

Exclusion criteria- Admitted Patients whose complete records could not be retrieved were excluded.

The data was retrieved from the triage forms, case sheets. At the triage area, the patients were classified for the clinical severity according to Clinical Management Protocol: COVID 19 version 5 by the MOHFW(10). Temperature and SpO2 was recorded using a thermal scanner and a pulse oximeter respectively.

The research and ethical approval was obtained from the Institutional Ethics Committee. Confidentiality of all the patients was maintained.

Results

A total of 903 patients were hospitalized during the study period in the Institute out of which clinical records of 9 patients were incomplete hence they were excluded, thereby 894 patients were included in the study. The mean age of study subjects was 47.68 ± 17.62 yrs with 39.1 % of the population belonging to 51-70 years. The clinical severity varied with the mean age of patients. The mean age of mild cases was 45.28 ± 17.83. The mean age for moderate and severe cases were similar that is 53.08 ± 16.83 and 54.86 ± 13.83 respectively.(Figure 1)

One-third of the study subjects were females. About 86 % of the people were symptomatic at the time of presentation to hospital for admission with most common symptoms being fever, cough and breathlessness. 53 % of the population had at least one-comorbidity. Diabetes and hypertension were the most common co-morbidities. (Table 1)

(Table 2) observed that around three-fourth of the study subjects was classified as having mild disease at the time of admission. Severe form of disease at the time of admission was reported in only 13.4 % of the population. Only 5.5% of the population reported at the triage area of the hospital with a basic life support. Fever was recorded at the triage area with a thermal scanner and 38% of the patients had fever on presentation. Among the patients ≥ 10 years (n=876), 63% did not have a respiratory difficulty (RR < 24 breaths/min). The oxygen saturation (SpO2) as measured by pulse oximeter was more than 94% in about three fourth of the subjects. (Table 2)

Spearman correlation was used to find out correlation between age, duration of symptoms, clinical severity and outcome of patients. A positive significant correlation was noticed between clinical severity with age and outcome of patients. (r= 0.224*, p=0.000 and r=0.293*, p=0.000). Outcome of the patient was also found to have a positive association with age (r=0,300*, p=0.000) and clinical severity (r=0.293*, p=0.000). (Figure 2)

A multi-nomial logistic regression model was fitted to the data to test the research hypothesis to test the relationship between clinical severity and other socio-demographic factors. There was a significant difference between the model without and with independent variables (χ^2 = 106.172, p=0.000). The model was a good fit as suggested by Pearson (χ^2 = 1198.47, p=0.491) and Deviance (χ^2 = 969.108, p= 1.000) statistics. The likelihood ratio for the model for individual predictors suggested that of all the predictors age (χ^2 = 14.513, p=0.001) and outcome of patient (χ^2 = 47.63, p=0.000). (Table 3).

a) Reference category is mild cases
b) Parameter is set as zero because it is redundant

The relationship is explained by the equation below:

Moderate clinical severity=(0.024*age) + (0.079*Duration) (Equation1)

Severe clinical severity=(0.020*age) +(-1.137*outcome of patient_cured)   (Equation 2)

Hence, consistent with the model, the log of odds for clinical severity displayed a significant positive association with age of the patient and duration of symptoms. However, a significant negative association was exhibited between clinical severity and outcome of patient.

Discussion

COVID 19 pandemic is a topic of interest for the researchers all over the world.The mean age of the patients in this study was 47.68± 17.62 years and ranged between < 1 year to 95 years. The median age was 50 years. The mean age of the patients was similar in most of the studies in India (11,12). The studies from China have reported a varied mean age, with some reporting as low as 34(13) while a study reported the mean age to be as high as 53(14). A study from New York has reported the mean age to be 63 (15). The current study reported the mean age of asymptomatic patients to be 48.03± 20. 56 years.The mean age among asymptomatic patients was reported in a systemic review to be still lower 31± 23.8

(16). This variation in mean age group could be due to the difference in the demographic profile in the different regions.

The current study reported a male preponderance among the hospitalized study subjects (67.1%). Fu et al in their meta-analysis have reported a median of 56.5% studies with a male predominance of Covid infection (5). Previously also MERS-Cov and SARS CoV have also found to have infected more males than females(17,18). The reduced susceptibility of females to viral infection can be attributed to X chromosome and sex hormones which play an important role in innate and acquired immunity.(19) Socio-economic (outdoor activities etc) and religious activities can also be accountable for the same but further research is needed to ascertain the cause.

The most common symptoms among patients at the time of presentation at hospital in the current study were fever and cough similar to other studies (5,6,20,21,8,9,11,14,22-25). However, Mohan et al in a study reported cough, nasal symptoms and throat irritation as the most common symptom (12).

More than half of the participants (53%) in the current study had at-least one of the co-morbidities. This distribution of co-morbidities was lesser in some of the other studies both from India and other parts of the world (6,9,11,12,20,22,25). Though, a study from China(8) stated a higher distribution of co-morbidities among COVID patients. This discrepancy may be due to the fear of COVID in general population esp. among co-morbid persons thereby leading to higher hospitalization but it needs further research. Similar to most of the studies the present study also found hypertension and diabetes mellitus as the most common co-morbidities (5–8,11,12,15,20,23,25). Some other studies reported by Chinese researchers observed chronic kidney disease, chronic liver disease, cardiovascular diseases and endocrine diseases as most common co-morbidities (9,22,14,20) but in Indian context the Hypertension and Diabetes Mellitus remains the most common co-morbidities present in General population as well as COVID patients.

The current study observed that the at the time of presentation at triage area, 37.8% of patients had fever and saturation of oxygen was more than 94 in 75% of the patients. The respiratory rate of about two-third of the patients (63.0%) was less than 24 beats per minute. Only 5.5% of the patients arrived at the triage with a basic life support. Based on the above parameters, it was found that at the time of arriving at the hospital, 75.7% of the patients were suffering from mild clinical illness while 13.4% of the patients were classified as having Severe disease. Similar to the present study, in most of the studies outside India, around one third of the patients had fever at presentation (6,15,20). However, a study from North India, recorded fever in only 11.1% of the patient. (12).Another study from North India reported a still lower

number of severe cases(12). The higher percentage of patients in the current study being classified as Severe disease may be due to that the institute in which the study was undertaken was a designated tertiary care center for COVID cases.

The cure rate of Covid- 19 patients in the current study is 82.9%. The rate of mortality in this study was 9.4%. Though, a study from North India reported a very low mortality of 1.4%(12) while few studies from abroad even reported no mortality(6,23). The difference in the mortality rates could be due that our study was conducted in a designated tertiary care center (L2 level hospital) which is supposed to be a admission center for moderate to severely sick patients. A systematic review and meta-analysis has reported a mean discharge rate of 52.9 % and a death rate of 13.9%(9)

The current study illustrates a positive significant correlation between age and duration of symptoms before presenting to the hospital. It is suggested that this could be possibly be due to recall bias. The elderly are more likely to ignore early symptoms and only report later when symptoms become more severe and intolerable(26). Similarly, a significant positive correlation was also proven between age, clinical severity of disease and outcome of the patient. CDC has reported that older adults are at a higher risk of getting hospitalizations and deaths (27). The clinical severity of Covid 19 disease was also found to be positively associated with age of patient and duration of symptoms and negatively associated with outcome of disease.

The disease COVID 19 has affected a large number of people. Although the disease is new, a lot has been known about the disease, but still there are some gaps in knowledge regarding Covid 19. The current study suggests that clinical severity of the disease is associated with age and duration of disease. It is suggested that an early diagnosis of the disease can avert the progression of disease to precarious severity. Therefore, intensive testing is one of the modalities to control the disease. Older adults are also at risk of developing severe disease. Hence the elderly should take extra precautions and have been rightly categorized as the priority group for the COVID vaccination.

Conclusion

Infection with COVID-19 is associated with significant morbidity especially in patients with chronic medical conditions and older age group patients. Similar to other viral respiratory pathogens, COVID-19 presents in the majority of cases with a rapidly progressive course of fever, cough and dyspnea. The rapid progression of disease warrants intense surveillance and isolation protocols to prevent further transmission. Additional research is needed to elucidate viral and host factors in the pathogenesis of severe and fatal infections. Research

is also required to develop new and effective treatment modalities especially for the elderly population.

Limitation of the study

Most of the socio-demographic factors were covered but a few factors like occupation and education which were not available in there records were not covered in this study. Both of these factors are supposed to affect the progression of disease. Length of stay in the hospital was also not taken into account in this study because the hospital followed the discharge policy of the GoUP(28). The study was limited to only in hospital clinical course only.

Relevance of the study

The study shows the clinico-epidemiological profile of the admitted covid 19 patients and these can be the contributing factors in the severity/outcome of the disease.

Authors Contribution

MK, DC, PKV, NJC, SS- Concept & Designing of study, Drafting of manuscript, Critical review & Finalization of manuscript.   MK, DC, SS- Acquisition, analysis and interpretation of Data.

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Tables

TABLE 1 SOCIO-DEMOGRAPHIC & CLINICAL CHARACTERISTICS OF STUDY PARTICIPANTS (N=894)

	Socio-demographic and Clinical Characteristics	Frequency	Percentage
	Mean Age (in years)	47.68± 17.62	
Age Groups	< 18 Years	38	4.3%
	19-30 years	145	16.2%
	31-60 years	499	55.8%
	≥ 61 years	212	23.7%
Gender	Male	600	67.1 %
	Female	294	32.9 %
Clinical profile	Asymptomatic	126	14.1%
	Symptomatic	768	85.9 %
Ever Reported Symptoms*(*Multiple Choice)	Fever	491	63.8%
	Cough	346	44.9%
	Breathlessness	334	43.4%
	Sore Throat	109	14.2%
	Diarrhea	12	1.6%
	Others	320	41.6%
Comorbidities	No	420	47.0 %
	Yes	474	53.0 %
Comorbidities (if any)	Diabetes	278	59.7%
	Hypertension	254	54.5%
	Cancer	6	1.3%
	COPD	11	2.4%
	Others	185	39.7%
Outcome of Patient	Cured	742	82.9%
	Died	80	9.4%
	LAMA/DOPR/Absconded	18	2.1%
	Referred	54	6.3%

TABLE 2 VITALS AND CLINICAL SEVERITY OF STUDY SUBJECTS AT PRESENTATION AT TRIAGE(N=894)

	Vitals and Clinical Severity at Triage	Frequency	Percentage
Temperature	**≤ 100 °F**	556	62.2%
	> 100 °F	338	37.8%
Respiratory Rate (Adolescents and Adults) (n= 876)	**<24/min**	563	63.0%
	24-30/min	300	33.6%%
	≥ 30/ min	13	1.5%
SpO$_2$	**>94%**	672	75.2%
	90-94%	128	14.3%
	<90%	94	10.5%
On BLS	**No**	845	94.5%
	Yes	49	5.5%
Clinical Severity	**Mild**	677	75.7%
	Moderate	97	10.9%
	Severe	120	13.4%

TABLE 3 MULTI-NOMIAL LOGISTIC REGRESSION BETWEEN CLINICAL SEVERITY AND SOCIO-DEMOGRAPHIC VARIABLES

CLINICAL SEVERITY OF DISEASE		B	Sig.	Exp	95% CI for Exp	
					Lower Bound	Upper Bound
	Intercept	-2.447	0.004			
	Age	0.024	0.002*	1.024	1.009	1.039
	Duration	0.079	0.036*	1.082	1.005	1.165
	Gender(Male)	0.055	0.812	1.057	0.672	1.663
	Gender (Female)	0^b	-			

CLINICAL SEVERITY OF DISEASE		B	Sig.	Exp	95% CI for Exp	
					Lower Bound	Upper Bound
Moderate	Comorbidity(No)	-0.236	0.318	0.790	0.498	1.254
	Comorbidity(Yes)	0[b]	-			
	Outcome of Patient (Cured)	-0.726	0.308	0.484	0.120	1.957
	Outcome of Patient (Referred)	-0.603	0.451	0.547	0.114	2.625
	Outcome of Patient (Died)	0.460	0.553	1.584	0.347	7.238
	Outcome of Patient(DOPR, Absconded, LAMA)	0[b]	-	-	-	-
Severe	Intercept	-1.888	0.019			
	Age	0.020	0.008*	1.021	1.005	1.036
	Duration	0.026	0.527	1.026	0.947	1.111
	Gender(Male)	0.246	0.305	1.279	0.799	2.047
	Gender (Female)	0[b]		-	-	
	Comorbidity(No)	-0.265	0.270	0.767	0.479	1.229
	Comorbidity(Yes)	0[b]		-	-	
	Outcome of Patient (Cured)	-1.137	0.082*	0.321	0.089	1.156
	Outcome of Patient (Referred)	-0.810	0.276	0.445	0.103	1.914
	Outcome of Patient (Died)	0.972	0.164	2.642	0.673	10.375
	Outcome of Patient(DOPR, Absconded, LAMA)		-	-	-	-

Figures

FIGURE 1 MEAN AGE OF PATIENTS ACCORDING TO CLINICAL SEVERITY.
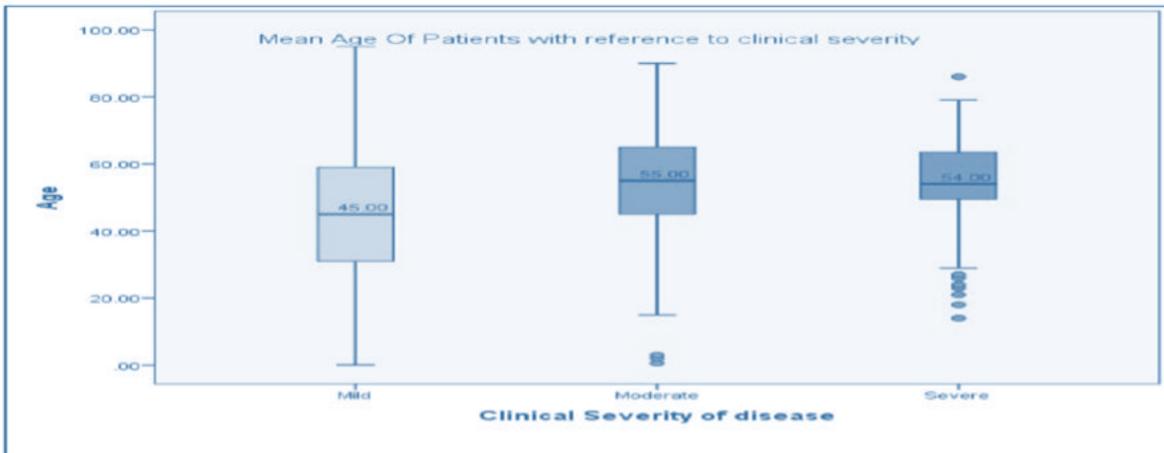

FIGURE 2 CORRELATION MATRIX OF AGE, DURATION, CLINICAL SERVERITY AND OUTCOME OF PATIENTS