



Association Of Clinical Profile And Risk Factors With Severity And Adverse Outcomes In Covid 19 Patients In A Tertiary Care Hospital

¹Kavya S T, ²Adishakthi K, ³Veena H A, ⁴Veerendra Patil, ⁵Sheeshan V S

¹Professor, ^{2,3,4}Postgraduate, ⁵Assistant Professor,
^{1,2,3,4}Department of Internal Medicine,
^{1,2,3,4}Bangalore Medical College and research Institute
⁵Dr. B R Ambedkar Medical College

***Corresponding Author:**

Adishakthi K

Postgraduate, Department of Internal Medicine,
Bangalore Medical College and Research Institute, Bangalore, Karnataka, India

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Abstract

Introduction:

COVID 19 was first reported in China in late 2019. The disease is severe in patients with risk factors such as Diabetes and Hypertension. The present study aims to evaluate clinical profile and risk factors with adverse outcomes in COVID 19 positive patients.

Materials And Methods:

This is a retrospective study conducted in a COVID designated tertiary care hospital in Bangalore. The data collected between December 2021 to March 2022 were analyzed for the clinical profile, risk factors and the outcome.

Results:

Out of the 671 samples, mean age was 52yrs, 398(59.3%) were males and 273(40.7%) were female patients. Majority of the patients were aged between 51-70yrs. 53.1% patients had mild disease and 14.5 % (100) of patients had severe disease. Hypertension and Diabetes were the major comorbidities as risk factors (59%). Other risk factors were ischemic heart disease, chronic kidney disease, bronchial asthma. The study shows that there is a strong correlation between age and severity of the disease (p value 0.001).

Conclusion:

The present study shows that with the increasing age, the severity of the disease increases. The disease is more severe in patients with comorbidities when compared to the general population. Hence early recognition of symptoms and prompt treatment is necessary.

Keywords: : COVID 19, Diabetes mellitus, Mortality

Introduction

Coronaviruses (CoVs) are enveloped positive sense RNA viruses that belong to the *Coronaviridae* family. First reported in Wuhan, China, in December 2019, Severe Acute Respiratory Syndrome Corona Virus 2 (SARS COV2) has caused epidemic and being responsible for death resulting from severe disease worldwide¹. The overall case

fatality rate due to COVID 19 was 10%². Compared to the first and the second wave, Omicron variant, which was responsible for third wave, has increased transmissibility, severe disease course, and reduced effectiveness of treatments. It is highly mutated when compared to the rest of the CoVs and hence labelled as Variants of Concern (VoC). The heavy

mutation in the spike protein of the Omicron variant is related to increased infectivity and antibody evasion¹². Considering the varied presentation, it is important to know the demographic details and the risk factors contributing to the mortality due to this disease. Hence this study is undertaken to know the demographic details and the risk factors of the disease during the third wave.

Materials And Methods:

This retrospective study was conducted in a COVID 19 designated tertiary care center. All patients who presented with symptoms of COVID 19 like fever, myalgia, loose stools and breathlessness during the third wave were tested through Real time polymerase chain reaction (RT PCR). Subjects with positive report were included in the study. 671 participants were included. The study was conducted between December 2021 – February 2022. Demographic details, severity and outcome was obtained from the study population. Demographic details included age, sex. Comorbidities included Diabetes Mellitus, Hypertension, Bronchial asthma, Ischemic heart disease, Chronic Kidney Disease, Retroviral disease, Chronic obstructive pulmonary disease(COPD) and others) of the subjects. Severity was assessed based on the room air saturation according to the ICMR guidelines¹⁰. Either death or discharge was considered as outcome. Mild cases were defined as saturation more than 94%. Moderate cases were defined as saturation between 90-94%. Severe cases were defined as saturation less than 90% or requiring ventilator.

Statistical Analysis:

SPSS (Statistical Package for Social Sciences) version 20. (IBM SPASS statistics [IBM corp. released 2011] was used to perform the statistical analysis.

1. Data was entered in the excel spread sheet.
2. Descriptive statistics of the explanatory and outcome variables were calculated by mean, standard deviation for quantitative variables, frequency and proportions for qualitative variables. Inferential statistics like Chi-square test was applied to associate the qualitative variables.
3. The level of significance is set at 0.05.

Results:

Of THE 671 subjects in the study population, mean age of the population was 52.22 years, ranging from 13-99 years. 59% were males and 41% were females. Majority of the study population belonged to age group 61-70yrs (n= 130) followed by 51-60 yrs. (n= 128). 115 subjects were in the age group >70 yrs. (n=115).

Majority of the study population had mild illness in the third wave. The severity of the infection increased with age. Out of the 109 subjects in the age group of 13-30 years, 84 (77%) of them had mild illness and 9% had severe illness, whereas 40% (n=47) had mild illness. 42% (n=49) has moderate illness and 15% (n= 18) had severe illness in the age group >70 years, with P value <0.05.

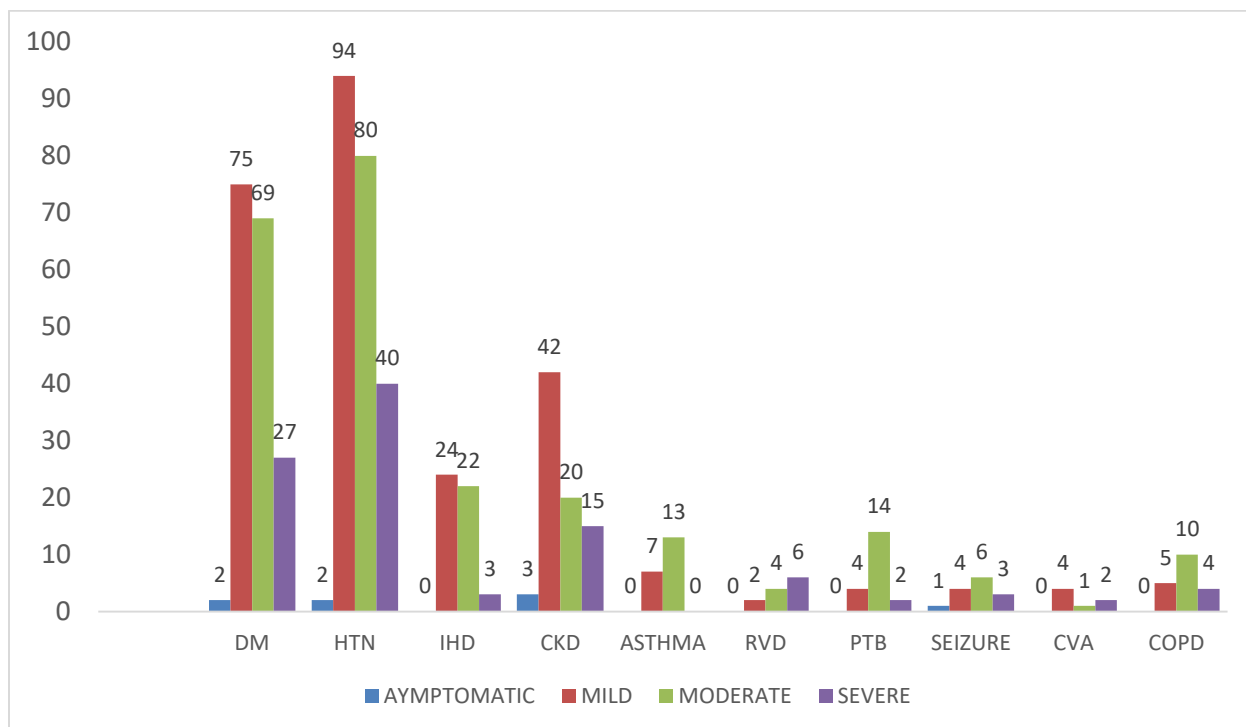
Table 1: Association Of Severity With Age Groups

Age groups		SEVERITY				Total
		ASYMPTOMATIC	MILD	MODERATE	SEVERE	
13 to 30	Count	6	84	10	9	109
	%	30.0%	23.6%	5.1%	9.0%	16.2%
31 to 40	Count	4	50	14	14	82
	%	20.0%	14.0%	7.2%	14.0%	12.2%
41 to 50	Count	2	61	27	17	107
	%	10.0%	17.1%	13.8%	17.0%	15.9%
51 to 60	Count	2	54	49	23	128
	%	10.0%	15.2%	25.1%	23.0%	19.1%

61 to 70	Count	5	60	46	19	130
	%	25.0%	16.9%	23.6%	19.0%	19.4%
> 70	Count	1	47	49	18	115
	%	5.0%	13.2%	25.1%	18.0%	17.1%
Total	Count	20	356	195	100	671
	%	100.0%	100.0%	100.0%	100.0%	100.0%
Chi-square value-63.67						
p value-0.001*						

Hypertension and Diabetes Mellitus were the major comorbidities. In the study population, hypertension as a comorbidity was present in 94% with mild illness, 80% with moderate illness and 40% with severe illness. Diabetes Mellitus as a comorbidity was present in 75% with mild illness, 69% with moderate illness, and 27% with severe illness. Half of the patient with Ischemic Heart disease had moderate illness (44%, n= 22). Patients with preexisting lung disease (asthma, COPD and Pulmonary tuberculosis) had higher disease severity. Almost 50% of the subjects with lung disease had moderate severity of COVID 19 disease.

Figure 1- Association Between Comorbidities With Severity Of Illness



Since majority of the patients had mild disease in third wave of COVID 19, there was positive outcome, with 87% (n=583) getting discharged and 12% (n= 86) death due to severe disease, though this association is not statistically significant (p -0.79). Diabetes as a comorbidity was significantly associated with worse outcome. Out of the total deaths, 23.3% had Diabetes; 25.9% of the total

discharged patients had the same disease (p value-0.049).

Discussion:

This study aims to evaluate the demographic details and the outcome in COVID 19 patients during the third wave. In our study, the disease was more severe in the older age group compared to the younger ones.

The result is consistent with the study conducted by Shoebill *et al*, where 61% of the total study population aged 50 years and above developed severe disease, and the majority of study population belonged to age group 30-40 years; in contrast to our study, where majority of them belonged to age group 61-70 years. This may be due to the study was conducted in the third wave of COVID 19 with a relatively milder disease compared to the previous wave³. Another study done by Kumar G *et al*, focusing exclusively on the demographic and clinical patterns in the third wave, found increased incidence of the disease in the younger population (31.6%) in 19-39 age group⁵.

COVID 19 is severe in patients with comorbidities. In our study, hypertension was the common risk factor followed by Diabetes Mellitus. In a study conducted by Seminary *et al*, Predominant risk factors were diabetes (54.3%), followed by cardiovascular diseases (28.8%) and chronic respiratory conditions (18.4%)⁴. Also, symptomatic study population with comorbidities had severe disease compared to the asymptomatic subjects. Similar finding were noted in the study conducted in Meghalaya with 180 patients¹¹.

Favorable outcome was noted in the third wave. This could be attributed to the milder disease, better vaccination coverage, newer treatment and increased awareness among population about COVID appropriate behavior. The studies conducted in New York⁶ and Spain⁷ and A prospective cohort study from the United Kingdom that observed clinical outcomes among the long-term care facility people noted reduced severity of infections (hospitalizations (0-64, 95% CI 0-41-1-00; p=0-051) and mortality (aHR 0-68, 0-44-1-04; p=0-076) caused by the omicron as compared to the previous variants^{8,9}.

Conclusion:

In our study, the comorbidities and the risk factor profile of the patients were assessed to determine the severity of the COVID 19 illness. In spite of the higher transmissibility of the virus, our study population had milder disease and better outcome compared to the previous two waves.

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