

Original Research Article

Epidemiological characteristics of COVID-19 patients of tertiary care hospital of Western Rajasthan

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ABSTRACT

Background: COVID – 19 is a pandemic that originated from Wuhan, China in the end of 2019. The objective of the present study is to report the epidemiological and clinical features of COVID-19 patients of tertiary care hospital of Western Rajasthan, India.

Methods: A total of 1632 cases of COVID-19 were investigated. The patients tested positive by RT-PCR assay were included in the study. The data was obtained from medical record forms of the patients.

Results: Out of total patients, 63.42% patients were male and 81.06% of patients were below age of 50 years. The mean of age was 34.93 ±17.61 years and median of age was 32 years. Asymptomatic patients or patients with mild symptoms constituted 66.66% of the study population and 35% of patients had comorbidities. The major comorbidities included diabetes mellitus (2.81%), hypertension (1.59%) and pulmonary diseases (1.04%). Total 40 deaths occurred so the overall CFR was 2.45%. Among the 40 deaths, the mean of age was 57.57±15.67 years. Patients over 50 years of age had the highest CFR among the age groups (18.93%). The CFR for males was 2.34% and for females 2.68%. A total of 14 (35.00%) of patients had multiple comorbidities.

Conclusions: The findings of our study emphasize the significant impact of old age and multiple comorbidities on the risk of mortality among COVID-19 patients. It is suggested to take adequate preventative measures more seriously in elderly patients. Also regarding medical care, it is vital to pay special attention to elderly patients with comorbidities.

Keywords: Clinical features, COVID-19, Epidemiology, Epidemiological characteristics

INTRODUCTION

In December 2019, several cases of pneumonia with unknown cause were reported in Wuhan, China.¹ Later on in January 2020, a new coronavirus was identified as cause for these pneumonia cases.² It rapidly spread worldwide and the World Health Organization gave the name COVID-19 for the disease and SARS-COV-2 to the causative virus. It was declared global pandemic by WHO on 11th March 2020.³ As on 5th June 2020, Globally 6 416 828 cases and 382,867 deaths were reported due to

coronavirus.⁴ India had 110960 active cases and 6348 death due to corona virus. In Rajasthan, 9862 cases and 213 deaths were attributed to COVID- 19 till 5th June 2020.⁵

Knowing the epidemiological features of COVID-19 will help to make more accurate decisions and control the epidemic. Several studies have reported the epidemiological features of COVID-19.⁶⁻⁹ But, these studies are mostly from China. The aim of the present study was the characterization of the epidemiological

features of COVID-19 in a tertiary care hospital of Western Rajasthan Here, we report the results of an epidemiological analysis of all cases hospitalized in Dr. S.N. Medical College and associated hospitals of Jodhpur, Rajasthan, India.

METHODS

The present study was a retrospective, epidemiological study that has been performed patients of COVID-19 in Dr. S. N. Medical College and associated hospitals of Jodhpur, Rajasthan, India. The current study is a retrospective observational case series of epidemiological features and clinical manifestations of COVID-19 positive patients who presented themselves to this center during the outbreak of 2019-2020 from 23rd March 2020 to 26th June 2020.

COVID-19 patients were confirmed by RT-PCR (reverse transcription-polymerase chain reaction) using throat and nose swab specimens from the upper respiratory tract. The study variables were: gender, age, type of comorbidities, duration of hospitalization and final outcome (including death or survival).

The research team from the Department of Medicine, Dr. S.N Medical College, Jodhpur analyzed the medical records of patients. The epidemiological and clinical characteristics were obtained with data collection forms from electronic medical records and history given by patients. A specialist from community medicine reviewed the data. Information recorded included demographic data, medical history, underlying comorbidities, symptoms, signs.

Data was collected through patient records forms. It included socio-demographic, epidemiologic and clinical details of COVID-19 patients.

Statistical analysis

Descriptive analyses of the variables were expressed as mean (\pm Standard Deviation=SD), median (with an interquartile range =IQR=Q1-Q3), or number (%). The analyses were based on non- missing data, and missing data were not imputed. The age and sex distribution were examined and relevant charts were drawn. Sex ratio (male to female) and the case fatality rate (CFR) were calculated. To investigate the effect of age, gender, and comorbidities on mortality, a binary logistic regression model was used. Adjusted Odds Ratio (OR) with 95% Confidence Interval (CI) was calculated. The α : 0.05 was considered as a significance level. The data were analyzed using the STATA version 11.0 and Excel version 2010.

RESULTS

By 26th June 2020, 1632 patients confirmed COVID-19 in Jodhpur, Rajasthan were enrolled in this study. The mean

of age was 34.93 ± 17.61 years and the median of age was 32 (46-65) years. The majority of cases were in the age group of 26 to 50 years. Also, most cases (63.42%) were male. The male to female ratio was 1.73:1.

1088 (66.66%) patients were either asymptomatic or had mild symptoms and 544 (33.33%) had moderate to severe symptoms. At the time of compilation of study 1266 (77.57%) patients were discharged, 286 (17.51%) were still admitted, 40 (2.45%) were home isolated and 40 (2.45%) died. Out of total 89.21% patients did not had any comorbidity. The major comorbidities included diseases like, diabetes mellitus (2.81%), hypertension (1.59%) and pulmonary diseases (1.04%). Hospital stay for the patients ranged from less than 10 days to more than 30 days. 49% of patients were hospitalized for less than 10 days and 11 patients had to be hospitalized for 11 days (Table 1).

Table 1: Epidemiological characteristics of COVID-19 patients.

Variable	N (%)
Age (years)	
0–25	559 (34.25)
26–50	764 (46.81)
>50	309 (18.94)
	Mean \pm SD: 34.93 \pm 17.61
Gender	
Male	1035 (63.42)
Female	597 (36.58)
Disease category	
Symptomatic (Moderate to severe)	544 (33.33)
Asymptomatic (No or mild symptoms)	1088 (66.66)
Outcome	
Discharge	1306 (80.02)
Hospitalized	286 (17.52)
Death	40 (2.45)
Duration in days	
<10	692 (49.00)
10–19	640 (45.32)
20–30	69 (4.22)
>30	11 (0.77)

Totally 40 deaths occurred during the entire study period, so the overall CFR was calculated to be 2.45% based on the total number of patients. Among the 40 deaths, the mean of age was 57.57 ± 15.67 years and median age was 58 years. A majority 27 (67.50%) were ≥ 50 years of age and 14(35.0%) had comorbidities. Patients over 50 years of age had the highest CFR among the age groups (18.93%). The CFR for males was 2.34% and for females 2.68%. A total of 14 (35.00%) of patients had multiple comorbidities. As shown in Figure 2, chronic respiratory diseases (7.50%), hepatic disease (5.00%), CNS disease (5.00%), chronic kidney diseases (5.00%), and diabetes

(5.00%), were the most common comorbidities. While patients who reported no comorbidity had a CFR of

0.96%, patients with comorbid conditions had 30.43% of CFR. (Table 2).

Table 2: Epidemiological factors on mortality of Covid-19 patients.

Variable	Frequency (%)	Death	CFR
Overall	1632	40	2.45%
Age (years)	0–25	02	0.35%
	26–50	11	1.43%
	>50	27	8.73%
Gender	Male	24	2.31%
	Female	16	2.68%
Comorbidity			
	None	14	0.96%
	Multiple comorbidities	14	30.43
	Diabetes Mellitus	03	7.69%
	Hypertension	02	3.84%
	Pulmonary (COPD, Asthma, TB)	02	11.76%
	Pregnancy	02	11.11%
	CNS disease	02	20.00%
	Thyroid disease	01	16.66%
	Cardiac disease	00	00
	Renal disease	00	00
	Hepatic disease	00	00
	Rheumatic disease	00	00
	Other(post surgery)	00	00
Variable	Odds ratio	Standard error	P value
Age	1.08	0.01	0.00
Male gender	0.00	1.24	0.987
Comorbidity	4.35	1.24	0.987

Table 3: Association of comorbidity with outcome.

Comorbidity	Outcome		P value
	Death (%)	Discharge (%)	
None	14 (35)	1133 (89.49)	<0.001 (S)
Multiple comorbidities	14 (35)	28 (2.21)	<0.001 (S)
Pulmonary disease	03 (7.50)	08 (0.63)	<0.001 (S)
Hepatic disease	02 (5.00)	01 (0.07)	<0.001 (S)
CNS disease	02 (5.00)	08 (0.63)	0.001 (S)
Renal disease	02 (5.00)	01 (0.07)	<0.001 (S)
Diabetes mellitus	02 (5.00)	37 (2.92)	0.447 (NS)
Cardiac disease	01 (2.50)	04 (0.31)	0.027 (NS)
Hypertension	00 (0.00)	20 (1.57)	-
Pregnancy	00 (0.00)	19 (1.50)	-
Thyroid disease	00 (0.00)	04 (0.31)	-
Rheumatic disease	00 (0.00)	02 (0.15)	-
Other(post surgery)	00 (0.00)	01 (0.07)	
Total	40 (100)	1266 (100)	

The results of binary logistic regression showed that there is no significant impact of gender (OR= 0.00, 95% CI) and marginally significant effect of age (OR=1.08, 95% CI) and highly significant effect of co-morbidity (OR=4.35, 95% CI) on risk of death in patients with COVID-19. In alignment with other studies, our study

exhibits people with comorbidities are at higher risk of mortality and require special care (Table 2).

On assessment of type of comorbidity it was found that the comorbidities like pulmonary disease, renal disease,

cardiac disease, CNS disease and hepatic diseases had significant impact on mortality (Table 3).

DISCUSSION

This is descriptive research of epidemiology and clinical characteristics of 1632 COVID-19 patients. In this study it was found that people of all ages were susceptible to the virus and our results are consistent with another studies where the median age is 32 years which is much less than that in Huang et al (49.0 years) and Chen et al (55.5 years) and Wang et al (56.0 years).^{2,6,7}

In our study male patients (63.42%) were more than female patients (36.58%), similar to than reported by Sun, Chen, Huang, Wang which reported male predominance of 73%. MERS-CoV and SARS-CoV infections were also found to infect more men than women.^{8,2,10,11}

This male predominance may be attributed to the fact that males are associated with more public exposure as compared to females as more than half i.e. about 66.66% of patients were asymptomatic or had mild symptoms. Another important factor that could influence the less susceptibility to infection in women is the X chromosome and the sex hormones which are known to play vital role in innate and adaptive immunity.

Data suggests that 66.66% patients had no or mild symptoms and moderate to severe symptoms were found in 33.33%. Our data suggesting asymptomatic patients is much more than that reported by Gupta et al who reported asymptomatic cases as 42.9%.¹²

Our estimates are consistent with previous studies, that fever is the most common symptom and most patients have multiple symptoms like cough, fever, fatigue, myalgia and sore throat.^{13,14}

The most common comorbidity was diabetes (2.38%) and hypertension (1.59%). Besides this diabetes, renal diseases, cardiac diseases were also found as comorbid diseases. A recently published systematic review and meta-analysis reports hypertension and diabetes as most common diseases.¹⁵

Our study reported overall CFR as 2.45%. Most of the studies have reported CFR between 2.5% to 3%.^{16,17}

The CFR in hospitalized patients was 13.98%. This finding is not unusual as the non-hospitalized patients were in better health conditions than the hospitalized patients. In a recent meta-analysis, based on compilation of seven studies, the CFR for hospitalized patients were reported as 13%.¹⁸

Limitations of study: The sample size in the present study is a major advantage, but more detailed clinical patient information and contact history of patient was unavailable

at the time of analysis. These shortcomings may limit the conclusions from this data.

CONCLUSION

The findings of our study emphasize the significant impact of old age and multiple comorbidities on the risk of mortality among COVID-19 patients, which are consistent the other studies. So it is suggested to take adequate preventative measures more seriously in the elderly patients. Also regarding medical care, it is vital to pay special attention to elderly patients who also have comorbidities.

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