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EPIDEMIOLOGICAL AND CLINICAL PROFILE OF COVID-19 PATIENTS' ADMITTED IN A TERTIARY CARE HOSPITAL, JORHAT

Medical Science

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ABSTRACT

Introduction: COVID-19 affected millions of people worldwide, causing unprecedented health systems disruptions and severely affected individuals' social, economic and psychological lives. Hence, it is essential to appreciate the influence of age structure while reporting mortality for a better summary of the magnitude of epidemic. This study aimed to investigate clinico-epidemiological profile of COVID-19 patients admitted in Jorhat Medical College and Hospital (JMCH), Jorhat, Assam. **Materials and Methods:** This was a hospital based cross-sectional study which includes positive COVID-19 admitted patients from May 2020 to December 2021. We investigated epidemiological and clinical profile of each patient from the submitted medical records. Statistical analysis was done using Microsoft excel and Mann-Whitney U test. **Results:** A total of 8072 positive cases were included in this study and majority of cases were between 45-59 years with slight male preponderance. During this period, 7343 (91%) patients were completely cured of COVID-19 symptoms hence discharged and 729 (9.0%) patients died during the treatment. The maximum number of fatality was observed at 551 (75.58%) patients. Among the admitted patients, 5062 (62.71%) had no significant comorbidity symptoms, compared to 3010 (37.29%) who had experienced multiple comorbidity symptoms. **Conclusion:** The outcomes of our study highlight that the death risk from COVID-19 is high among elder age group with multiple comorbidities. Therefore, aged individuals with comorbidities should receive extensive medical treatment with preventative measures. This study could aids in future research for making decisions on preventing infection in high risk populations, controlling existing comorbid conditions, and prioritising vaccination.

KEYWORDS

COVID-19, Mortality, Comorbidity, Clinico-epidemiological profile

INTRODUCTION

Corona virus (SARS-cov2 or COVID-19) escalated as a global pandemic in the different countries and territories around the world. The virus had infected more than 650 million people with about 6.6 million deaths (https://www.worldometers.info). The first case in India was reported on 30 January 2020 and currently India records second highest number of Covid cases (4.47 Cr), next to US (9.88 Cr) (https://www.worldometers.info). The mortality rates indicate an opportunity to detect deaths rates in a health system[1]. The COVID-19 mortality is an important key to determine the infection rate in the community. The virus can cause mild to severe course of illness in many patients, leading to hospitalization and even death in elderly or patients with co-morbid conditions[2]. In India, the second wave of COVID had affected the younger generations[3]. Age and underlying medical factors had a major impact on the likelihood of mortality from COVID-19[4]. Older patients and those with chronic co-morbidities such as cardiovascular disease, hypertension, diabetes, and pulmonary disease etc. had significantly higher risk of serious and fatal illness outcomes.

The epidemiological features varies for different countries, therefore it is important to generate evidence on this aspect. This study was investigated to determine the epidemiological characteristics for the tested samples and compared the trends across different age groups, gender and symptoms of COVID-19 positive patients in JMCH. This hospital prioritized the care of COVID-19 positive patients by including substantial number of hospital beds, intensive therapy units, and ventilators. This research could lead to the provision of epidemiological behaviour regarding COVID-19 transmission, prevention, and control of the virus.

MATERIALS AND METHODS

Study Sites

This was a tertiary hospital based cross-sectional study conducted at Viral Research and Diagnostic Laboratory, Department of Microbiology, JMCH, Jorhat, to access the epidemiological characteristics of COVID-19 infected patients during May 2020 to December 2021.

Sample strategy

The cases of COVID-19 positive patients admitted in JMCH were retrieved with laboratory confirmed SARS-CoV-2 infection, irrespective of clinical symptoms or signs. The data were collected based on socio-demographic information on age, gender, personal details, date of COVID-19 detection and clinical characteristics (including death or survival) of each patient from electronic medical

records and history given by the patients.

Population estimation
The age structure of the patients were differentiate using a uniform distribution of 15 years as ≤15 years, 15-29 years, 30-44 years, 45-59 years, 60-74 years and ≥75 years.

Mortality rate of patients
The mortality rate of admitted patients was estimated by calculating the number of COVID-19 deaths for each age group and divided by the age group population. The co-morbidity rate was also calculated based on total number of patient discharge and deceased.

Statistical analysis
Descriptive analysis of data based on age, sex distribution and the fatality rate were performed using Microsoft Excel. Comparisons of data were done using Chi-square test and p-value <0.05 was considered as significant.

Ethical consideration
The study was investigated to aggregate the data of COVID-19 positive patients based on age and death outcomes. All permissions were obtained from the competent authority of the hospital.

RESULTS AND DISCUSSION

A total of 8072 patients with confirmed COVID-19 positive in JMCH were considered in this study. Figure 1 shows the district-wise distribution of all COVID-19 positive patients.

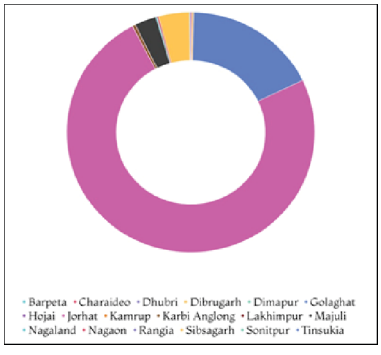

Figure 1: Graphical presentation of district-wise distribution of COVID-19 positive admitted patients during May 2020 to December 2021

Out of these positive patients, 4951patients were male and 3121were female. This data reveal that males were more likely to get infected with COVID-19 compared to females and remains persistent with most studies in the literature to support the findings[5,6,7]. Though, the reason for such male preponderance is not yet known, but a probable reason could be males were more likely to involve in outdoor activities as compared to females[8]. The other reason might be the female X chromosome, which had the greatest concentration of immune-related genes in the entire human genome[9]. The finding encourages further investigation to evaluate gender-based comprehensive studies to uncover the COVID-19 pattern that was specific to each gender and assists in the development of therapies to halt the disease's progression. The maximum of infected cases were in the age group of 45-59 years accounting for 25.52% of the patients. The majority of the cases were tended to be male with 64.51% (n=1329) and female with 35.49% (n=731) (Table 1).

Table 1: Age wise distribution of COVID-19 patients from May 2020 to Dec 2021

Sl No.	Age group (in years)	Male (%)	Female (%)	Frequency (%)	No. Of Deaths (%)
1	<15	134 (58)	97 (42)	231 (2.86)	6 (2.59)
2	16-29	680 (44.62)	844 (55.38)	1524 (18.89)	23 (1.50)
3	30-44	1286 (64.43)	710 (35.57)	1996 (24.73)	87 (4.35)
4	45-59	1329 (64.51)	731 (35.49)	2060 (25.52)	215 (10.43)
5	60-74	1125 (66.18)	575 (33.82)	1700 (21.06)	269 (15.82)
6	>75	397 (70.76)	164 (29.24)	561 (6.95)	129 (22.99)
	Total	4951	3121	8072	729
	Mean	825.16	520.16	1345.32	121.5

Based on this observation, it is assumed that the age group is more actively associated with outdoor activities due to occupation related reasons. Further research could rule out the possibility that younger age groups (those under 15) were less prone to infection than older age groups because they participate in virtual education and assessment and engage in fewer outdoor activities[10]. Additionally the death rate (22.99%) was found higher among the age group >75 years due to COVID-19 infection compared to younger age groups. This could be due to the fact that ageing is associated with a number of physiological changes, co-morbid disorders, and reduced immunity, making this age group more prone to illnesses in general[11,12].

Among the admitted positive patients, 5062 patients were either asymptomatic or had mild symptoms and 3010 patients had moderate to severe symptoms. The outcomes of the admitted patients were shown in figure 2.

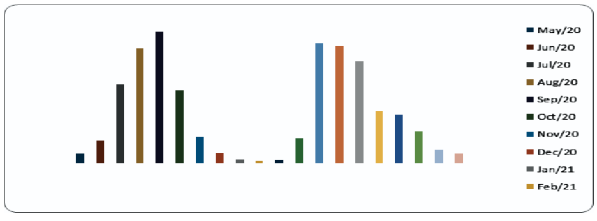

Figure 2: Month-wise distribution of the COVID-19 positive admitted patients from May 2020 to December 2021

A total of 7343 (91%) patients were completely cured of COVID-19 symptoms hence discharged and 729 (9.0%) patients died during the treatment (Figure 3).

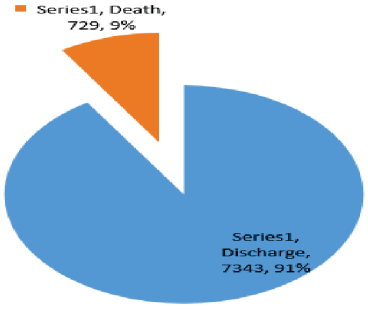

Figure 3: Discharge and death rate of COVID-19 hospitalized patients from May 2020 to December 2021

It was found that 3010 patients (37.29%) experienced co-morbidity symptoms, where as 5062 (62.71%) of treated COVID-19 patients did not have any co-morbidity symptoms (Table 2).

Table 2: Mortality rate of COVID-19 patients according to co-morbidity

Co-morbidity	Total Discharge	No. Of Deaths	Total	X2 test (P value)
Present	2459 (33.49%)	551 (75.58%)	3010 (37.29%)	502.53 p-value <0.00001
Absent	4884 (66.51%)	178 (24.42%)	5062 (62.71%)	
Total	7343 (91%)	729 (9%)	8072	

The mean age of co-morbid was found to be 70 years and chi-square value was 502.53 with significant P-value <0.00001. These results were consistent with other studies and suggest that individuals with pre-existing chronic illnesses or lifestyle risk factors were more likely to experience a fatal COVID-19 outcome[13,14,15].

However, due to the high prevalence of these co-morbidities and the average age of patients who passed away after contracting SARS-CoV-2, this led directly to a valid discussion over how much COVID-19 or pre-existing medical issues influenced the death occurred.

Additionally, our findings were supported by the fact that the median prolong hospital stay for COVID-19 positive individuals with co-morbidities were marginally longer than for cases without co-morbidities[16]. However, we did not include a factor of co-morbidity due to time and resource constraints considering how important role co-morbidity could intervene with morbidity and mortality of COVID-19 cases. However, limited data were recorded based on fatalities of COVID-19 co-morbid individuals; therefore extensive research could aids to determine the exact cause in future.

CONCLUSION

According to the results of our study, men were more vulnerable to COVID-19 exposure and COVID-19-related mortality. Overall, the middle-aged people were significantly affected in COVID-19 which may be because they spend more time in public settings. Another important finding of the study emphasised the direct correlation between patient age and underlying co-morbidities and disease severity. Age and co-morbidities were linked to the severity of COVID-19 infection and fatalities. COVID-19 positive patients with co-morbid conditions experience higher adverse outcomes than patients without coexisting diseases. This indicates that patients with co-morbid conditions were more susceptible to the illness. The reason for the higher mortality rate in male individuals is yet unknown. In order to study the potential causes of the observation, there is an urgent need for research in this area. The assessment of social and behavioural factors for higher prevalence and higher mortality in the male gender would be interesting in addition to the genetic factors. Therefore, it is suggested to implement proper prevention measures for aged patients and to give co-morbidity patients more consideration.

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Conflicts of interest

The authors have no conflict of interest to declare.

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