

Epidemiological, Clinical Characteristics and Comorbidities Among Deceased Patients with COVID 19 Infection: A Retrospective Study

Manish Kumar

Assistant Professor, Department of General Medicine, Netaji Subhas medical College
and Hospital, Bihta, Patna, Bihar, India

Received: 10-01-2023/ Revised: 05-02-2023 / Accepted: 08-03-2023

Corresponding author: Dr. Manish Kumar

Conflict of interest: Nil

Abstract

Aim: The aim of the present study was to assess epidemiological, clinical characteristics and comorbidities among deceased patients with COVID-19 infection.

Methods: The Retrospective study among deceased patients with COVID-19 infection at Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India for COVID-19. The study included patients who succumbed to COVID-19 for the period of two years.

Results: The mean age was 58.02 years and there was a male (70%) preponderance among the study population. Majority of patients were elderly, 61–80 years of age group (41%). The mean duration of illness was 5.5 days. The most common comorbidities among the deceased were diabetes (46%) and hypertension (40%) followed by chronic kidney disease (26%), coronary artery disease (8%), and COPD (12%). The mean duration of hospitalization was 4.2 days. Among clinical parameters, majority (65%) of patients had tachycardia (heart rate >100/min). Most of the patients who presented to the hospital had respiratory rate >24/min (92%) and mean oxygen saturation of 68% at room air. The most common symptoms at the time of presentation were breathlessness (93%) and fever (75%) followed by cough (35%), myalgia, and fatigue (24%).

Conclusion: Majority of the patients who contracted the illness and died due to COVID-19 were elderly, males with diabetes and hypertension. At the time of presentation, the majority had respiratory distress of acute onset. Elderly population with comorbidities is more prone to disease and has higher chances of respiratory failure and death.

Keywords: Comorbidities, COVID-19, Hypoxia, Bihar, Pandemic.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

The 2019-nCoV causing an ongoing outbreak of respiratory illness called novel coronavirus pneumonia which has infected many populations till date. Coronavirus disease 2019 (COVID-19), a novel infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), [1] has become a global

public health concern as the number of deaths due to COVID-19 continues to increase. In February 2021, the COVID-19 mortality rate was estimated to be roughly 3% globally. [1] It has resulted in millions of deaths even in India. However, data on intensive care mortality in the Indian population has been sparse. [2] Clinical

spectrum of SARS-CoV-2 infection ranges from asymptomatic or mild, self-limiting respiratory tract disease to severe progressive pneumonia leading to acute respiratory distress syndrome and death. The proportion of patients with severe illness requiring admission to an intensive care unit (ICU) has been reported to be between 4 and 32%. [3] The clinical features and severity of COVID-19 vary among individuals, based on multiple factors, such as age and associated comorbidities. [4] Asymptomatic COVID-19 patients may not require hospitalization. [5-7] However, severe cases, for example, patients with systemic inflammation, pneumonia, hypoxemia, and peripheral oxygen saturation (SpO₂) of < 92%, require hospitalization. Patients with severe COVID-19 may become critically ill with acute respiratory distress, shock, myocardial injury, heart failure, coagulation dysfunction, and acute kidney injury, all of which may lead to death. [8] Knowledge of the epidemiological and clinical features of patients who demise due to COVID-19 is needed for a better understanding and proper management of the disease, and these features have been evaluated in a few studies. [9] Realizing that there are little data and inadequate mortality assessments in a COVID-19 Indian ICU setting, we embarked upon this study to describe clinical characteristics, outcomes, and factors associated with mortality in patients with COVID-19 requiring intensive care in a tertiary care hospital in Bihar, with very limited resources.

The aim of the present study was to assess Epidemiological, clinical characteristics and comorbidities among deceased patients with COVID 19 infection.

Materials And Methods

This study was conducted in Netaji Subhas medical College and Hospital, Bihar which is dedicated to COVID-19. It was a retrospective observational study. The epidemiological and clinical features of

patients presenting to this centre were recorded. A total of 1000 patients admitted in COVID ICU NSMCH who died during the hospital stay were taken in this study. Patients were diagnosed to have COVID-19 by reverse transcription-polymerase chain reaction at the Department of microbiology or referred from other facilities. The data were collected retrospectively from medical records and included demographic data, age, sex, smoking history, blood group, comorbidities, clinical symptoms, laboratory test results, radiological findings, treatment medications, and period of hospitalization. Comorbidities included diabetes, hypertension, cardiovascular disease, chronic kidney disease, cancer, and obesity. The most prevalent clinical COVID-19 symptoms were fever, cough, dyspnea, chest pain, diarrhea, and confusion. The laboratory tests evaluated complete blood count, coagulation profile, and renal and liver function. The dates of COVID-19 diagnosis, hospital admission, and death were also recorded. The survival time during hospitalization (length of stay) was defined as the period between the date of admission and death. The Ethics Committee) granted ethical approval for the study to be conducted, and the research complied with the Declaration of Helsinki. Consent was waived as data were anonymous and collected retrospectively (secondary data).

Statistical Analysis

Data entry and analysis were performed using Statistical Package for the Social Sciences® software. [15] The categorical variables were presented as percentages, and the continuous variables were described using mean ± standard deviation (SD) for the normally distributed variables and the median (interquartile range [IQR]) for the non-normally distributed variables. The chi-square test was used to assess any significant associations between the categorical variables. The independent-

samples t-test was utilized to compare differences in the mean between the groups (adjusted for age and BMI). The paired-samples t-test and the Wilcoxon signed-rank test were applied to compare any differences over time for the normally and non-normally distributed independent continuous variables, respectively. A

binary logistic regression model was explored the predictors of mortality during the early stay in hospitals. The Cox regression for survival analysis was also investigated the effect of predictors upon the time of mortality during the early stay in hospitals. A p-value of <0.050 was statistically significant.

Results

Table 1: Baseline characteristics

| Characteristics | N% |
|---------------------------------------|----------|
| Male | 700 (70) |
| Female | 300 (30) |
| Age (years) | |
| <20 | 20 (2) |
| 21-40 | 120 (12) |
| 41-60 | 400 (40) |
| 61-80 | 410 (41) |
| >80 | 50 (5) |
| Mean age±SD | 58.02±12 |
| Duration of illness (days) | |
| 1-3 | 280 (28) |
| 4-6 | 350 (35) |
| 7-9 | 220 (22) |
| >10 | 150 (15) |
| Mean duration of illness (days)±SD | 5.5±2.4 |
| Comorbidities | |
| Diabetes mellitus | 460 (46) |
| Hypertension | 400 (40) |
| Chronic kidney disease | 260 (26) |
| Coronary artery disease | 80 (8) |
| Chronic obstructive pulmonary disease | 120 (12) |

The mean age was 58.02 years and there was a male (70%) preponderance among the study population. Majority of patients were elderly, 61–80 years of age group (41%). The mean duration of illness was 5.5 days. The most common comorbidities among the deceased were diabetes (46%) and hypertension (40%) followed by chronic kidney disease (26%), coronary artery disease (8%), and COPD (12%).

Table 2: Clinical characteristics at presentation

| Characteristics | N% |
|-------------------------|----------|
| Heart Rate | |
| <100 | 350 (35) |
| >100 | 650 (65) |
| Respiratory rate (/min) | |
| <24 | 80 (8) |

| | |
|--|----------|
| >24 | 920 (92) |
| Oxygen saturation (%) | |
| >90 | 50 (5) |
| 81-90 | 70 (7) |
| 71-80 | 300 (30) |
| <70 | 580 (58) |
| Mean oxygen saturation(%)±SD | 68±8.2 |
| Symptoms | |
| Fever | 750 (75) |
| Cough | 350 (35) |
| Breathlessness | 930 (93) |
| Sore throat | 70 (7) |
| Myalgia/fatigue | 240 (24) |
| Sputum | 120 (12) |
| Diarrhoea | 110 (11) |
| Duration of hospitalization (days) | |
| <1 | 350 (35) |
| 1-5 | 500 (50) |
| >5 | 150 (15) |
| Mean duration of hospitalisation (days)±SD | 4.2±1.8 |

The mean duration of hospitalization was 4.2 days. Among clinical parameters, majority (65%) of patients had tachycardia (heart rate >100/min). Most of the patients who presented to the hospital had respiratory rate >24/min (92%) and mean oxygen saturation of 68% at room air. The most common symptoms at the time of presentation were breathlessness (93%) and fever (75%) followed by cough (35%), myalgia, and fatigue (24%).

Discussion

First case of Corona virus disease 2019 (COVID-19) was reported in Wuhan, China in December 2019. Soon the disease spread to most countries of world and was declared Global pandemic by World health Organization on 11th March 2020.[10] In India the first case of COVID-19 was detected on January 30, 2020 in a 20 year old female who had returned to Kerala from Wuhan, China.[11] Mortality rate due to COVID-19 vary across regions but

WHO estimates global mortality to be about 3% of cases.[12]

The mean age was 58.02 years and there was a male (70%) preponderance among the study population. Majority of patients were elderly, 61–80 years of age group (41%) similar findings were reported by Grasselli et al[13] from Italy among 1591 patients infected with COVID-19 where 82% of the patients were male. The mean duration of illness was 5.5 days. The most common symptoms at the time of presentation were breathlessness (93%) and fever (75%) followed by cough (35%), myalgia, and fatigue (24%). Bhandari et al[14] in their study observed Fever (48%) as the most common symptom followed by cough and shortness of breath.

The mean duration of hospitalization was 4.2 days. Among clinical parameters, majority (65%) of patients had tachycardia (heart rate >100/min). Most of the patients who presented to the hospital had respiratory rate >24/min (92%) and mean

oxygen saturation of 68% at room air. The most common comorbidities among the deceased were diabetes (46%) and hypertension (40%) followed by chronic kidney disease (26%), coronary artery disease (8%), and COPD (12%). In a similar study published in New York by Richardson et al[15] among 5700 patients hospitalised with COVID-19 infection, the most common comorbidities were hypertension (56.6%), obesity (41.7%), and diabetes (33.8%). The mean duration of illness at the time of admission was 5.5 days supported by the study done by Zhao et al[16] on 77 patients with a median time of illness onset to the admission of 5 days.

Conclusion

The present study provides an insight into various epidemiological and clinical parameters of patients who succumbed to COVID-19. It could be observed that elderly patients with comorbidities were more prone to contracting the virus and had a more severe disease progression. Majority of the patients who contracted the illness and died due to COVID-19 were elderly, males with diabetes and hypertension. At the time of presentation, the majority had respiratory distress of acute onset. Elderly population with comorbidities is more prone to disease and has higher chances of respiratory failure and death.

References

1. World Health Organization. Coronavirus disease (COVID-19): weekly epidemiological, update 1. Weekly Epidemiological Update. Geneva: WHO; 2020.
2. Shukla U, Chavali S, Mukta P, Mapari A, Vyas A. Initial experience of critically ill patients with COVID-19 in Western India: A case series. Indian Journal of Critical Care Medicine: Peer-reviewed, Official Publication of Indian Society of Critical Care Medicine. 2020 Jul;24(7):509.
3. Aziz S, Arabi YM, Alhazzani W, Evans L, Citerio G, Fischkoff K, Salluh J, Meyfroidt G, Alshamsi F, Oczkowski S, Azoulay E. Managing ICU surge during the COVID-19 crisis: rapid guidelines. Intensive care medicine. 2020 Jul; 46:1303-25.
4. Badedi M, Makrami A, Alnami A. Comorbidity and blood group type risk in coronavirus disease 2019 patients: a case-control study. Journal of Infection and Public Health. 2021 Apr 1;14(4):550-4.
5. Bai Y, Yao L, Wei T, Tian F, Jin DY, Chen L, Wang M. Presumed asymptomatic carrier transmission of COVID-19. Jama. 2020 Apr 14;323(14):1406-7.
6. Ye F, Xu S, Rong Z, Xu R, Liu X, Deng P, Liu H, Xu X. Delivery of infection from asymptomatic carriers of COVID-19 in a familial cluster. International Journal of Infectious Diseases. 2020 May 1; 94:133-8.
7. Verity R, Okell LC, Dorigatti I, Winskill P, Whittaker C, Imai N, Cuomo-Dannenburg G, Thompson H, Walker PG, Fu H, Dighe A. Estimates of the severity of coronavirus disease 2019: a model-based analysis. The Lancet infectious diseases. 2020 Jun 1;20(6):669-77.
8. Yuki K, Fujiogi M, Koutsogiannaki S. COVID-19 pathophysiology: A review. Clinical immunology. 2020 Jun 1; 215:108427.
9. Panthee B, Dhungana S, Panthee N, Gyawali S, Paudel A, Panthee S. Clinical and epidemiological features of COVID-19 deaths in Nepal. New Microbes and New Infections. 2020 Nov 1; 38:100797.
10. Lai CC, Wang CY, Wang YH, Hsueh SC, Ko WC, Hsueh PR. Global epidemiology of coronavirus disease 2019 (COVID-19): disease incidence, daily cumulative index, mortality, and their association with country healthcare resources and economic status. International journal of

- antimicrobial agents. 2020 Apr 1;55(4):105946.
11. Andrews MA, Areekal B, Rajesh KR, Krishnan J, Suryakala R, Krishnan B, Muraly CP, Santhosh PV. First confirmed case of COVID-19 infection in India: A case report. *The Indian journal of medical research*. 2020 May;151(5):490.
 12. World Health Organization. Who Director-General's opening remarks at the media briefing on COVID-19. 2020.
 13. Grasselli G, Zangrillo A, Zanella A, Antonelli M, Cabrini L, Castelli A, Cereda D, Coluccello A, Foti G, Fumagalli R, Iotti G. Baseline characteristics and outcomes of 1591 patients infected with SARS-CoV-2 admitted to ICUs of the Lombardy Region, Italy. *Jama*. 2020 Apr 28;323(16):1574-81.
 14. Bhandari S, Shaktawat AS, Sharma R, Dube A, Kakkar S, Banerjee S, Keshwani P, Sharma S, Mahavar S, Nawal CL, Mehta S. A preliminary clinico-epidemiological portrayal of COVID-19 pandemic at a premier medical institution of North India. *Annals of Thoracic Medicine*. 2020 Jul;15(3):146.
 15. Richardson S, Hirsch JS, Narasimhan M, Crawford JM, McGinn T, Davidson KW, Barnaby DP, Becker LB, Chelico JD, Cohen SL, Cookingham J. Presenting characteristics, comorbidities, and outcomes among 5700 patients hospitalized with COVID-19 in the New York City area. *Jama*. 2020 May 26;323(20):2052-9.
 16. Zhao W, Zha X, Wang N, Li D, Li A, Yu S. Clinical characteristics and durations of hospitalized patients with COVID-19 in Beijing: a retrospective cohort study. *Cardiovascular Innovations and Applications*. 2021 Sep 1;6(1):33-44.