Clinical profile of COVID-19 patients admitted in a tertiary care hospital of Nepal: A descriptive cross-sectional study

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Abstract

Background: Coronavirus disease 2019 (COVID-19) causes mild to severe respiratory illness and is associated with ICU admission and mortality. Since data regarding clinical profile of COVID-19 patients in Nepal is still lacking, it is important to study clinical behaviour of COVID-19 in Nepal. In this study the demographic profile, clinical features, lab parameters, and outcomes in hospitalised COVID-19 patients in a tertiary care hospital are reported.

Objective: To assess the clinical profile in terms of clinical symptoms, laboratory parameters, and outcome of COVID-19 admitted patients in a tertiary care hospital.

Methods: This is a descriptive cross-sectional study conducted at KMCTH, from June 1, 2021 to July 31, 2021 after taking ethical clearance from institutional review committee. All patients infected with COVID-19 admitted in this hospital, from June 1, 2021 to July 31, 2021 were included by convenience sampling. Data were collected, and entry and analysis were done in Microsoft Excel Sheet 2007.

Results: During the study period, 245 COVID-19 patients were admitted and were included in the study. The median age of the patients was 55 years, the mean age was 55 ± 17 years, and 139 (56.74%) were male. The common presenting complaints were cough in 180 (73.47%) followed by fever in 176 (71.84%) patients. Most common comorbidity found was hypertension in 89 (36.33%), followed by diabetes in 50 (20.44%).

Conclusion: In this single-centred study, the characteristic features included presence of comorbidities, higher level of inflammatory markers, and high mortality rate in severe to critical hospitalised COVID-19 patients.

Key words: Coronavirus disease 2019; Diagnosis; Nepal; Severe acute respiratory syndrome coronavirus-2; Syndrome.

INTRODUCTION

The novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) causes coronavirus disease 2019 (COVID-19). The virus has spread worldwide, causing mild to severe respiratory illness, and is associated with Intensive Care Unit (ICU) admission and mortality.[1-3] World Health Organisation declared COVID-19 as a pandemic on March 11, 2020.[4]

As of January 29, 2022, there have been 364,191,494 confirmed cases of COVID-19, including 5,631,457 deaths globally;[5] and 939,267 cases with 11,687 deaths in Nepal,[6] reported to WHO. The clinical presentation and outcome of COVID-19 are variable in different countries.[5,7-14] Since the data regarding the clinical profile of COVID-19 patients in Nepal is still lacking, it is important to study the clinical behaviour of COVID-19 in the local population.

This study reports the demographic and clinical profile of the patients in terms of age, sex, clinical features, lab

parameters, comorbidities, and outcomes in hospitalised COVID-19 patients during the second wave of COVID-19 infection in Kathmandu Medical College.

METHODOLOGY

This descriptive cross-sectional study was conducted at the Kathmandu Medical College and Teaching Hospital, Kathmandu, Nepal, from June 1, 2021, to July 31, 2021. Ethical clearance was taken from the institutional review board of Kathmandu Medical College and Teaching Hospital (Ref. 2005202104).

All patients infected with COVID-19 admitted to Kathmandu Medical College and Teaching Hospital, Kathmandu, Nepal, from June 1, 2021, to July 31, 2021, who were willing to participate in the study were included in the study utilising convenience sampling technique. The COVID-19 infection was confirmed by a positive result on real-time reverse transcriptase-polymerase chain reaction (RT-PCR) assay for SARS-CoV-2 on an oropharyngeal and/or a nasopharyngeal swab. RT-PCR negative antibody-positive patients, RT-PCR negative antigen-positive patients were excluded. Pregnant women and children <18 years were excluded.

Patients of severe and critical illness according to WHO case definition[15] requiring advanced treatment in the form of oxygen support and/or intensive care were admitted to the hospital. Those patients with mild to moderate illness not requiring hospital care were not admitted and advised for home treatment during triage at the Emergency department due to a lack of enough hospital resources during the second wave of COVID-19. Written informed consent was taken by the treating team from the patients or immediate family members in case the patient was unable to consent himself/herself. Data collection was done by filling out self-structured proforma designed for the study. Demographic details, medical history including comorbidities, history of exposure to COVID-19, and vital parameters were recorded at admission to the hospital. Baseline laboratory parameters, treatment details, and clinical outcomes were also collected and were followed up till patients were admitted or a maximum of 14 days if discharged before 14 days.

Symptomatic patients were categorised to have a critical, severe, or non-severe disease as per the definition provided by the WHO.[15] Patients with acute respiratory distress syndrome (ARDS), sepsis, septic shock, or other conditions that would normally require the provision of life-sustaining therapies such as mechanical ventilation

(invasive or non-invasive) or vasopressor therapy were classified as 'Critical COVID-19'. 'Severe COVID-19' was defined by the presence of any of the following: Oxygen saturation <90% on room air, in adults, signs of severe respiratory distress (accessory muscle use, inability to complete full sentences, respiratory rate >30 breaths/min). 'Non-severe COVID-19' was defined as an absence of any criteria for severe or critical COVID-19.[15]

The treatment protocol was followed as per the international[13] and local institutional guidelines.

Data entry and analysis were carried out using Microsoft Excel Sheet 2007. All quantitative data such as age, blood parameters, and laboratory values were estimated using the median and interquartile range. Categorical variables were presented as frequency and percent (n, %).

RESULTS

During the study period, 245 patients diagnosed to have severe and critical COVID-19 were admitted and were included in the study. The mean age of the patients was found to be 55±17 years, the median age was 55 years (IQR: 42 to 67.5 years, range: 19 to 95 years, Table 1) and 139 (56.74%) were male.

All patients were symptomatic at admission. Among the admitted patients, severe and critical illness was seen in 225 (91.83%) and 20 (8.16%) patients, respectively. The common presenting complaints were cough in 180 (73.47%) followed by fever in 176 (71.84%) patients. The prevalence of other symptoms seen in patients is shown in (Table 2).

At triage, 125 (51.02%) patients were hypoxic with oxygen saturation (SpO2) <90 percent on room air, 225 (88.6%) had tachypnoea (respiratory rate >20/ min) while seven (2.76%) had hypotension (blood pressure <90/ 60 mm Hg). Seventeen (6.94%) patients required oxygen supplementation via facemask or nasal prongs while three (1.22%) required mechanical ventilation at the time of admission. Baseline laboratory characteristics of patients at the time of admission are shown in (Table 3).

Common comorbid conditions found in patients were hypertension in 89 (36.33%), diabetes in 50 (20.44%), Chronic Obstructive Pulmonary Disease (COPD) in 12 (4.9%) and chronic renal disease (CKD) in seven (2.86%) patients. Forty-eight patients (19.59%) had multiple comorbidities. The prevalence of other comorbidities is shown in (Table 4). A higher level of inflammatory biomarkers at admission [C-reactive protein (CRP),

D-dimer, and lactate dehydrogenase (LDH)] was present among the admitted patients. The study revealed a 39% mortality rate (96 patients) among admitted patients (Table 5).

Elderly patients (age >60 years), presence of comorbidities such as hypertension and diabetes, and

increased serum levels of inflammatory biomarkers (CRP, D-dimer, and LDH) at admission were higher among severe and critically ill patients.

The mean hospital stay duration was 11.67±9.04 days, and the median hospital stay of the patients was nine days.

Table 1: Age distribution of admitted COVID-19 patients

Age range (years)	Number of female (%)	Number of male (%)
15-24	3 (1.22)	2 (0.81)
25-34	15 (6.12)	10 (4.08)
35-44	14 (5.71)	28 (11.42)
45-54	19 (7.76)	27 (11.02)
55-64	19 (7.76)	35 (14.29)
65-74	22 (8.98)	20 (8.16)
75-84	9 (3.67)	10 (4.08)
85-95	5 (2.04)	7 (2.86)
Total	106 (42.27)	139 (56.73)

Table 2: Prevalence of symptoms seen in hospitalised COVID-19 patients

Symptoms	Frequency (%)
Cough	180 (73.47)
Fever	176 (71.84)
Shortness of breath	160 (65.3)
Myalgia	93 (37.96)
Chest pain	90 (36.73)
Nausea / vomiting / anorexia	38 (15.51)
Diarrhoea	27 (11.02)
Headache	25 (10.20)
Ageusia / anosmia	25 (10.2)
Abdominal pain	17 (6.93)

Table 3: Prevalence of baseline laboratory parameters seen in COVID-19 admitted patients

Baseline laboratory parameters	Frequency (%)
Leucocytosis (WBC count > 11000/ mm3)	32 (13.06)
Leucopenia (WBC count <4000/ mm3)	12 (4.9)
Neutrophilia (Neutrophils >75%)	137 (55.92)
Neutropenia (Neutrophils <40%)	2 (0.87)
Lymphopenia (Lymphocytes <20%)	121 (49.39)
Lymphocytosis (Lymphocytes >45%)	3 (1.22)
High Neutrophil-to-lymphocyte ratio (NLR) (≥3.5)	121 (49.39)
Thrombocytopenia (Platelet count <0.15 million)	27 (11.02)
Anemia (Hemoglobin < 12 g%)	52 (21.22)
High aspartate aminotransferase (AST >45 U/L)	67 (27.35)
High alanine aminotransferase (ALT >45 U/L)	86 (35.10)
High alkaline phosphatase (ALP >306 U/L)	105 (42.86)
High C-reactive protein (CRP >10 mg/dl)	126 (51.43)
High D-dimer level (>0.5 mg/ L)	58 (23.68)
High lactate dehydrogenase (LDH >333 U/L)	93 (37.96)

Table 4: Frequency of comorbidities seen in admitted COVID-19 patients

Comorbidities	Frequency (%)
Hypertension	89 (36.33)
Diabetes mellitus	50 (20.41)
Hypothyroidism	15 (6.12)
Chronic obstructive pulmonary disease	12 (4.9)
Chronic kidney disease	7 (2.86)
Acute kidney injury	6 (2.45)
Asthma	5 (2.04)
Tuberculosis	3 (1.22)
Congestive heart failure	2 (0.82)

Table 5: Outcome of admitted COVID-19 patients

Outcome of patients	Number of patients (%)
Recovered	149 (60.81)
Dead	96 (39.19)

DISCUSSION

The demographic profile, clinical characteristics, lab parameters, hospital course, and outcome of the 245 patients admitted to a tertiary care hospital in Kathmandu, Nepal were reported in this study. The median age of patients was 55 years which is similar to a study conducted in Wuhan by Wang et al. (56 years).[12] However, it is a decade older than that reported in studies conducted in North India (33.4 years, 40.1 years, 43.5 years)[7-9] and a meta-analysis conducted in China (41 years);[13] and younger than that reported in studies conducted in New York (62.2 years),[10] and Italy (63 years).[14]

The COVID-19 patients in the study showed a slight male preponderance of 139 (56.73%) which is similar to that reported by Wang et al. (54.3%)[12] and Soni et al. (58%)[7] but the percentage of male patients was lesser than other studies conducted by Huang et al. (73%),[4] and studies conducted in New York (60.6%)[10] and Italy (82%).[14]

In the study, the cough was the most common symptom present in patients 180 (73.47%) followed by fever 176 (71.84%) which was in contrast to that reported in Soni et al. (77%), Wang et al. (98.6%),[12] Yue et al. (47.7%),[11] and Huang et al. (98%)[4] in which most common symptom was fever. However, it was supported by Mohan et al.[8] and a study conducted in New York[10] where the commonest symptom was found to be cough with the percentage of cough being reported as 34.7% and 79.4% in respective studies.

The most common comorbidity associated with patients was hypertension in 89 (36.33%) followed by diabetes mellitus in 50 (20.41%) which was similar to Soni et al.[7] and Grasselli et al.[14] with 16.6% and 49% hypertensive patients respectively.

During admission, hypoxia with SpO2<90% was seen in 125 (55.92%) of patients which was much higher than a study conducted in India (17%).[7] Tachypnea was seen in 225 (88.5%) of patients which is substantially higher than a study conducted in India (31%).[7] This is because severe to critical patients requiring advanced treatment were only admitted to the hospital while other patients were advised for home treatment due to a shortage of hospital resources during the second COVID-19 wave.

Among the hospitalised patients, 121 (49.39%) presented with lymphopenia which was lesser than that reported by Wang et al. (70.3%),[12] Yue et al. (67.4%),[11] Huang et al. (63%).[4] High Neutrophil to Lymphocyte Ratio (NLR) was found in 121 (49.39%) of the patients which was higher than that reported by Soni et al. (37%).[7] In this study, thrombocytopenia was seen in 27 (11.02%) of patients which was similar to a study conducted in India (13%)[7] but lesser to studies conducted in New York (27%).[10]

The laboratory evaluation of patients showed that most of the patients demonstrated deranged liver function tests and elevated levels of CRP, LDH, and D-dimer levels.

The mean hospital stay duration was 11.67 days, and the median hospital stay of the patients was nine days which is lesser compared to a study conducted in Wuhan by Wang et al. with a median hospital stay of 14 days.[12]

The mortality rate of the study was 96 (39.18%) which is much higher compared to that reported in previous studies including Soni et al. (2.6%),[7] Mohan et al. (1.4%),[8] Wang et al. (4.3%),[12] Huang et al. (15%),[4] and a meta-analysis conducted in China (3.6%).[13] This huge disparity may be due to the difference in the severity of patients included in study. In this study, potential contributors include only the severe and critically ill patients since hospitalisation in Nepal was limited to patients with more severe disease due to lack of hospital resources during the second wave of COVID-19. Among these patients, most of them did not have a good prognosis at the time of admission.

As the study is a single centred, with convenience sampling, tertiary hospital-based study, the majority of the patients that presented and got admitted had severe to critical disease. Thus, the spectrum of COVID-19

disease was underrepresented in study. Thus, the results cannot be generalised to all the COVID-19 patients in Nepal.

CONCLUSION

In conclusion, the study highlights some important differences in Nepalese patients from those already reported in the literature from China, India, Europe, and the United States of America. The most common age group was found to be 40 to 70 years. In this single-centered study, characteristic features include the presence of comorbidities, higher level of inflammatory markers including CRP, LDH, and D-dimer, and high mortality rate in severe to critical hospitalised COVID-19 patients. It is recommended to conduct a multi-centred study including primary, secondary as well as tertiary COVID-19 centres of Nepal to include the patients of all severities ranging from mild, moderate, and severe to critically ill patients.

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