

Clinico-Demographic, Hematological, and Comorbidity Profile of COVID-19 Patients Admitted at Tertiary Care Center

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Abstract

Introduction: Severe acute respiratory syndrome coronavirus 2 has caused a worldwide pandemic. This study was aimed to describe the clinico-demographic, hematological, and comorbidity profile in a group of coronavirus disease 2019 (COVID-19) patients at a tertiary care center in north India. **Materials and Methods:** We conducted a prospective, single-center collection of data regarding clinico-epidemiological, hematological parameters, and comorbidity profile of COVID-19 patients admitted at a tertiary care facility. **Results:** Data from 200 patients with COVID-19 were collected and analyzed. The median age of the patients was 48 years, with 63% males, and 78% patients were from urban area. Ten patients were smokers while 11 patients were alcoholic. The occupation of 20.6% of patients was related directly or indirectly with medical or allied professions. The most common mode of transmission of COVID-19 was direct close contact with microbiologically confirmed patients. Fever ($n = 93$; 46.5%) was the most common presenting symptom and the median duration of onset of symptoms before admission were 3.5 days (range 2–6 days). In hematological profile, lymphopenia ($n = 48$; 24%) had been the most common documented finding. Comorbidities were present in 39 (19.5%) patients, of which diabetes mellitus ($n = 25$; 12.5%) was the most common. Furthermore, the case fatality rate in our study was 1.5%. **Conclusion:** Among all patients of COVID-19 at our center, the characteristic findings included high proportion of male patients with younger to middle-age group, diabetes as most common comorbidity and people who were directly or indirectly in contact with the health-care system were more prone for developing the disease.

Keywords: Clinico-demographical, comorbidity, coronavirus disease 2019, reverse transcription polymerase chain reaction

INTRODUCTION

At the end of December 2019, a novel coronavirus was identified as the cause of a cluster of pneumonia cases in Wuhan, China, that has spread worldwide as a global pandemic. In February 2020, the World Health Organization designated the disease as coronavirus disease 2019 (COVID-19). The virus that causes COVID-19 is termed as severe acute respiratory syndrome coronavirus 2. As per the WHO data, as on October 26, 2020, a total of 43,341,451 confirmed cases and 1,157,509 deaths had been reported worldwide. As of October 25, 2020, the Ministry of Health and Family Welfare, India, has confirmed 7,864,811 COVID-19 cases and 118,534 deaths constituting second highest COVID-19 affected country after the United States. The clinico-demographic profile and outcomes of patients with COVID-19 have been variable in different countries.^[1] It is important to analyze and document the clinical presentation and comorbidity associated with

this novel disease in the Indian population. The objective of this paper is to analyze the clinical spectrum of the patients ranging from their age, sex, travel history, clinical symptoms, laboratory evaluation, and associated comorbidity.

MATERIALS AND METHODS

All microbiologically confirmed Covid-19 patients admitted at Dr. Ram Manohar Lohia Institute of Medical Sciences (Dr. RMLIMS), Lucknow, from March 1, to submission

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of paper, were enrolled for the study. Written informed consent was obtained from all patients. Ethical approval was obtained from the ethical committee of the institution. Dr. RMLIMS is one of the dedicated COVID-19 care facility in Lucknow. Our center is designated as a referral facility (Level 3) for all COVID-19 patients from nodal public and private sector hospital, as per the government policy. All suspected patients of COVID-19 received at screening area, undergone reverse transcription polymerase chain reaction for COVID-19 pneumonia. All microbiologically confirmed COVID-19 cases were triaged into isolation facility, ward, high dependency unit or intensive care unit as per their clinical assessment. Data on epidemiological, demographic, clinical feature, travel history, addiction, laboratory, and associated comorbidity were obtained with data collection forms electronic medical records and history given by patients. Data on symptom onset and resolution were recorded. Time elapsed between the onset and resolution of symptoms was taken as time to clinical resolution. Further laboratory evaluation and treatment protocol was followed as per the Government of India Ministry of Health and Family Welfare guideline on COVID-19 pneumonia.

RESULTS

A total of 200 patients were studied, of whom 126 (63%) were male and 74 (37%) patients were female. The age-wise distribution of COVID-19 patients is shown in Table 1. Among 200 patients, 156 (78%) patients were from urban area while 44 (22%) were from rural area with 10% patients have some kind of addiction in form of alcohol consumption, tobacco chewing or smoking. The occupation of 20.6% of patients was related directly or indirectly with medical or allied professions. Close contact with COVID-19 patients ($n = 140$; 70%) constituted the most common mode of transmission. Other modes of transmission include foreign travel to an affected country ($n = 5$; 2.5%), and household close contact with a known COVID-19 patient ($n = 70$; 35%). Among all admitted patients, the most common symptoms were fever ($n = 93$; 46.5%); dry cough ($n = 73$; 36.5%); dyspnea ($n = 44$; 22%); body ache ($n = 54$; 27%); tiredness ($n = 34$; 17%); throat irritation ($n = 20$; 10%); and nasal symptoms ($n = 16$; 8%). The median duration of onset of symptoms before admission was 3.5 days (ranges from 2 to 6 days).

Baseline hematological and biochemical parameters are presented in Table 2. Anemia was present in 85 (42.5%) patients with mean hemoglobin of 12.59 g/dl. 15 (7.5%) patients had leukopenia (total leucocyte count [TLC] $<4000/\mu\text{l}$) while leukocytosis (TLC $>11,000/\mu\text{l}$) was present in 19 (9.5%) patients with mean polymorphs of 58.1% (ranges between 10% and 93%) and mean lymphocyte of 29.8% (ranges between 3% and 76%). Thrombocytopenia was present in 69 (34.5%) patients with mean platelet count of 2.04 lakh/cumm. Alanine aminotransferase levels were increased in 140 (70%) with more than five times in 5 patients. Aspartate aminotransferase levels

were increased in 87 (43.5%) with more than five times in 2 patients. Comorbidities were present in 39 (19.5%) patients, of which diabetes mellitus ($n = 25$; 12.5%) was the most common comorbidity observed, while 12 (6%) patients were suffering from both diabetes and hypertension. Comorbidity profile of COVID-19 patients is shown in Table 3. The treatment was given as per the Ministry of Health and Family Welfare guideline on COVID-19 pneumonia. Among

Table 1: Age-wise distribution of coronavirus disease 2019 patients

Age (years)	n (%)
<10	2 (1)
10-20	17 (8.5)
20-30	73 (36.5)
30-40	39 (19.5)
40-50	33 (16.5)
50-60	25 (12.5)
>60	11 (5.5)

Table 2: Baseline haematological and biochemical parameters in our cohort (n=200)

	Mean \pm SD	Range
Hb (g %)	12.59 \pm 2.37	3.96-17.1
WBC (cells/cumm)	7.16 \pm 3.96	3.02-25.1
RBC (cells/cumm)	4.27 \pm 0.83	1.62-7.8
Platelets (lakhs/cumm)	2.04 \pm 1.18	0.56-8.44
MCV (fl)	90.52 \pm 12.88	29-123
MCH (pg/cell)	30.03 \pm 4.41	18-43
MCHC (g/dl)	33.01 \pm 4.79	23-76
Polymorphs (%)	58.1 \pm 15.99	10-93
Lymphocytes (%)	29.80 \pm 13.48	3-76
Eosinophils (%)	2.438 \pm 0.37	0-13
Monocytes (%)	8.24 \pm 4.63	0-40
Serum_urea (mg %)	22.97 \pm 9.16	4.8-47
Creatinine (mg %)	0.83 \pm 1.19	0.32-12.27
Bilirub_total (mg %)	0.80 \pm 1.46	0.15-14.8
Bilirub_direct (mg %)	0.24 \pm 0.68	0-6.8
Alkaline Phosphatase (IU/L)	90.01 \pm 56.59	36-387

SD: Standard deviation, WBC: White blood cell, RBC: Red blood cell, MCV: Mean corpuscular volume, MCH: Mean corpuscular hemoglobin, MCHC: MCH concentration, Hb: Hemoglobin

Table 3: Comorbidity profile of coronavirus disease 2019 patients

Comorbidity	n (%)
Diabetes	25 (12.5)
Hypertension	21 (10.5)
Chronic kidney disease	2 (1)
Coronary artery disease	9 (4.5)
Tuberculosis	2 (1)
Chronic obstructive pulmonary disease/asthma	1 (0.5)
Human immunodeficiency virus infection	2 (1)
Immunocompromised	2 (1)

132 symptomatic patients, 65 (49.2%) became asymptomatic in <5 days, 39 (29.5%) between 5 and 10 days and 28 (21.2%) became asymptomatic more than 10 days after commencement of treatment. Three out of 200 admitted patients died during course of treatment accounting case fatality rate of 1.5%. Diabetes was found to be the most common comorbidity among all deaths.

DISCUSSION

We reported the epidemiological profile, clinical characteristics, laboratory, and comorbidity profile of 200 COVID-19 patients admitted to dedicated COVID care hospital of Dr. RMLIMS, Lucknow. In our study, the median age of COVID-19 patients was 48 years which was closest to study done by Huang *et al.*^[2] (49.0 years) and Guan *et al.*^[1] (47 years). Majority of COVID-19 infected patients were male (63%) which was accordant to the study done by Huang *et al.* and Chen *et al.* (73.0%). This male predominance may have happened due to the fact that the majority of our patients were from hotspot area, created by public gathering, and mainly attended by males. Among 200 admitted COVID-19 patients, 10 (5%) patients were smokers, and 11 (5.5%) were alcoholic. According to a recent systematic review and meta-analysis, smoking appears to be a risk factor for COVID-19 progression with higher prevalence of smoking among COVID-19 patients with severe, progressive disease, or intensive care admission.^[3] The most common mode of transmission of COVID-19 virus in our patients was direct (in 70% patients) which was accordant to most studies done across the globe. Among all admitted patients, fever was the most common symptom ($n = 93$; 46.5%) followed by dry cough ($n = 73$; 36.5%) which was similar to that reported by Huang *et al.* (91.7%) and Wang *et al.* (87.9%). In our study, lymphopenia had been the most common ($n = 48$; 24%) documented findings on complete blood count panel for the patients with COVID-19 infection among all hematological variables and this finding in our study correlates with various previous studies conducted elsewhere. In our study, the most common comorbidity was diabetes mellitus ($n = 25$; 12.5%)

while hypertension was second-most common ($n = 21$; 10.5%). The less common comorbidities were coexisting infection with HIV ($n = 2$; 1%), renal disorders ($n = 2$; 1%), immunodeficiencies ($n = 2$; 1%), active tuberculosis ($n = 2$; 1%), and COPD ($n = 1$; 0.5%). In contrary to our study, most of the previous meta-analysis had demonstrated hypertension as the most common associated comorbidity in the COVID-19 patients.^[4] Furthermore, the case fatality in our study was 1.5% (3/200) and the trend was closest to study done by Guan *et al.*^[1] from China and Mohan *et al.*^[5] from India.

CONCLUSION

COVID-19 disease is a very infectious disease with most common route of transmission through direct contact. The disease is more prevalent in young adult and middle age group, history of addiction and with history of diabetes. People who were directly or indirectly in contact with the health-care system are more prone to contract the disease.

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Conflicts of interest

There are no conflicts of interest.

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