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Original Article

Clinical characteristics of non-intensive care unit COVID-19 patients in Saudi Arabia: A descriptive cross-sectional study

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ABSTRACT

Introduction: The ongoing pandemic of the coronavirus disease 2019 (COVID-19) is a global health concern. It has affected more than 5 million patients worldwide and resulted in an alarming number of deaths globally. While clinical characteristics have been reported elsewhere, data from our region is scarce. We investigated the clinical characteristics of mild to moderate cases of COVID-19 in Saudi Arabia.
Methods: This is a descriptive, cross-sectional study. Data of 401 confirmed COVID-19 patients were collected from 22 April 2020 to 21 May 2020 at five tertiary care hospitals in Riyadh, Saudi Arabia. The patients were divided into four groups according to age, Group 1: 0–<18 years, Group 2: 18–<50 years, Group 3: 50–60 years, and Group 4: >60 years; and their clinical symptoms were compared.
Results: The median (IQR) age in years was 10.5 (1.5–16) in group I, 34 (29–41) in group II, 53 (51–56) in group III, and 66 (61–76) in group IV. Most patients were male (80%, n = 322) and of Arabian or Asian descent. The median length of stay in the hospital was 10 (8–17) days (range 3–42 days). The most common symptoms were cough (53.6%), fever (36.2%), fatigue (26.4%), dyspnea (21.9%), and sore throat (21.9%). Hypertension was the most common underlying comorbidity (14.7%), followed by obesity (11.5%), and diabetes (10%). Hypertensive patients were less likely to present with shortness of breath, cough, sputum, diarrhea, and fever.
Conclusion: There was no significant difference in the symptoms among different age groups and comorbidities were mostly seen in the older age group. Interestingly, hypertensive patients were found to have milder symptoms and a shorter length of stay. Further larger collaborative national studies are required to effectively understand clinical characteristics in our part of the world to efficiently manage and control the spread of SARS-CoV-2.

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Introduction

In early December 2019, an outbreak of pneumonia cases caused by an unknown pathogen was reported from Wuhan, China [1]. With the aid of real-time reverse transcription-polymerase chain reaction (RT-PCR) and next-generation sequencing from their respiratory tracts, researchers isolated a novel strain of coronavirus [2]. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was the unearthed strain of coronavirus causing the contagious respiratory illness, which was later named coronavirus disease 2019 (COVID-19). The causative agent was then named Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). On comparative modeling, SARS-CoV-2 showed a 79% phylogenetic similarity to SARS-CoV, with a comparable receptor-binding domain (ACE2) [2]. Initial cases were thought to be linked to a large livestock and seafood market selling different wild animal species, suggesting zoonotic transmission [3]. However, the epidemiology of the disease then changed to sustained human-to-human transmission of the virus [4].

Since the outbreak, the disease has spread rapidly across the globe, resulting in a worldwide COVID-19 pandemic. According to the World Health Organization (WHO), as of August 22, 2020, 22,812,491 confirmed cases of COVID-19 have been recorded worldwide, with 795,132 deaths [5]. In the Kingdom of Saudi Arabia, the Ministry of Health confirmed the first COVID-19 positive case on March 2, 2020 [6]. Till now, 306,370 confirmed cases have been recorded and 3619 individuals have died in the Kingdom [7].

Although it is difficult to assess the case fatality rate of COVID-19 before the pandemic is over, the available data suggests that China has a case-fatality rate of 5.5%, France with 25.4%, United Kingdom with 14.2%, Italy with 14.4%, Brazil with 5.6%, United States of America with 5.8%, and Saudi Arabia presently has a case-fatality rate of 0.6% [8]. This may be due to locally prevalent factors (including recent exposure to the Middle East respiratory syndrome coronavirus (MERS-CoV) epidemic [9] and endemicity of malaria) and the multiple prompt measures taken by the government of Saudi Arabia to control the spread of the virus. Worldwide, COVID-19 has a significantly higher case fatality rate than influenza (0.1%), comparable to SARS (10%), but lower than the MERS-CoV (34%) [9,10].

Given the rapid spread of COVID-19 and the sparse data from our region, here we describe the results of our analysis of the epidemiological and clinical characteristics of COVID-19 patients admitted at five private tertiary care hospitals in Saudi Arabia.

Methods and materials

Study design

This descriptive, cross-sectional study was conducted at the five private tertiary care hospitals in Riyadh, Saudi Arabia (Dr. Sulaiman Al-Habib Medical Group's hospitals (As-Suwaidi, Rayan, Al-Takhassusi, Olaya) and Al-Hammadi hospital). All admitted patients with confirmed COVID-19 from 22/4/2020 to 21/05/2020 were enrolled in the study. We used a cross-sectional study design to assess the burden of mild and moderate COVID-19 cases in the Saudi population.

Data collection

A predesigned and unified data collection form was designed to collect pre-specified data variables from non-ICU patients' electronic medical records by trained physicians. The study was approved by Dr. Sulaiman Al Habib Medical Group Institutional Review Board, reference number (RC20.04.79). All the data collected were used for the benefits of the present study only. Patient demographics, comorbidities, clinical signs or symptoms, were all obtained through the data collection form. The diagnosis of COVID-19 was based on the Novel Corona Virus (2019-nCoV) Infection Guidelines issued by the Ministry of Health of Saudi Arabia.

The study population was divided into four age groups:

Group 1: 0–<18 years
Group 2: 18–<50 years
Group 3: 50–60 years
Group 4: >60 years

We also compared the clinical characteristics between diabetic patients and non-diabetics, hypertensive patients and non-hypertensive patients.

Definitions

Patients' severities were classified based on the "Chinese Clinical Guidance for COVID-19 Pneumonia Diagnosis and Treatment" published by the World Health Organization. "Mild" was defined as mild clinical symptoms or asymptomatic with no signs of pneumonia in imaging; and "Moderate" was defined as having fever or respiratory tract symptoms and signs of pneumonia in imaging [11]. Hypertension was defined as an elevated blood pressure (SBP > 120 or DBP > 80) Diabetes mellitus was defined as hemoglobin A1c > 6.5% (>48 mmol/mol), Fasting Blood Glucose > 126 mg/dL (>7.0 mmol/L), 2-h postprandial > 200 mg/dL (>11.1 mmol/L) during 75-mg OGTT or Random plasma glucose > 200 mg/dL (>11.1 mmol/L) in a symptomatic patient. Cardiological disease was defined as patients with involved heart and/or blood vessels condition other than hypertension, such as coronary heart diseases, stroke, heart failure, cardiomyopathy, atrial fibrillation, arrhythmia, Marfan's syndrome, venous thromboembolism, peripheral arterial disease, heart valve diseases, aortic aneurysms, and congenital heart diseases. Respiratory Disease was defined as patients with diagnosed chronic respiratory diseases, such as chronic obstructive pulmonary disease (COPD), emphysema, asthma, acute/chronic bronchitis, pulmonary fibrosis, pneumonia, lung cancer, occupational lung disease, and pulmonary hypertension. Chronic kidney disease was defined as patients with identified chronic kidney disease (CrCl <15 ml/min for >3 months). Dyslipidemia was defined as total cholesterol ≥200 mg/dL, LDL-C ≥ 100 mg/dL, triglycerides ≥150 mg/dL, or HDL-C ≤40 mg/dL in males and ≤50 mg/dL in females. Immunodeficiency was defined as subjects with any identified congenital or acquired immunodeficiency (e.g., common variable immunodeficiency, human immunodeficiency virus (HIV) infection, organ transplantation). Adult obesity was defined as BMI 30.0 or above. It was further subdivided into Class I: BMI of 30.0 to <35.0/Class II: BMI of 35.0 to <40.0/Class III BMI of 40.0 or higher. Childhood Obesity was defined as BMI at or above the 95th percentile for children and teens of the same age and sex. Pregnancy was defined as clinically tested by the detection of hCG in the sample. Smoking was defined as an adult who has smoked 100 cigarettes in his or her lifetime and who currently smokes cigarettes. The hospital length of stay was defined as the period between the date of admission to the date of discharge or the date of transfer to another hospital; patients still admitted to the hospital were excluded from the calculation of the length of stay.

Statistical analysis

Data were analyzed using SPSS (V.24.0). A value of $p < 0.05$ was considered statistically significant. Distribution of the continuous variables was carried out by the Shapiro–Wilk test. Frequencies and percentages were calculated for categorical variables. The χ^2 test was applied to examine categorical data. Chi-square test was also employed to detect the relationship between the categorical

Table 1
Comparison of demographics between age groups (n = 401).

Variable		Group I (0–<18y) n = 16	Group II (18–<50y) n = 309	Group III (50y–60y) n = 51	Group IV (>60y) n = 25	P-value
Age Median (IQR); Range		10.5 (1.5–16) 7mon–17y	34 (29–41) 19–49y	53 (51–56) 50–58y	66 (61–76) 60–88y	**<0.0001**
Gender	Male	15 (93.8%)	250 (80.9%)	38 (74.5%)	18 (72%)	0.26
	Female	1 (6.3%)	59 (19.1%)	13 (25.5%)	7 (28%)	
Smoking	Non-smoker	16 (100%)	282 (91.3%)	49 (96%)	23 (92%)	**<0.0001**
	Smoker	–	21 (6.8%)	2 (4%)	2 (8%)	
	Former smoker	–	6 (1.9%)	–	–	
Description of Hospital Stay	Still	13 (81.3%)	241 (78%)	44 (86.3%)	17 (68%)	0.321
	Transferred	1 (6.3%)	14 (4.5%)	0	3 (12%)	
	Discharged	2 (12.5%)	54 (17.5%)	7 (13.7%)	5 (20%)	
Hospital Length of Stay (transferred/discharged)		5	9.5 (8–16.75)	20 (11–24)	12 (7.75–16.75)	**0.027**
Severity	Mild	10 (62.5%)	171 (55.3%)	40 (78.4%)	20 (80%)	**0.003**
	Moderate	6 (37.5%)	138 (44.7%)	11 (21.6%)	5 (20%)	

Frequencies & Percentages are given for categorical data; Median (IQR) for non-normally distributed data. A p-value of <0.05 is considered significant.
The bold values are the significant p-values that are <0.05.

variables. The chi square test was used to compare the clinical characteristics between hypertension and non-hypertensive groups and diabetes and non-diabetic groups. We calculated length of stay from the date of admission to date of discharge/transfer. The median (IQR) length of stay is given for all. Then we analyzed according to age groups and calculated the median (IQR) length of stay of each age group. These medians were compared using Kruskal–Wallis test. Then we analyzed the length of stay according to hypertension or no hypertension, gave median (IQR) of both and compared medians using Mann–Whitney U test. Then we analyzed according to diabetes or no diabetes, gave median (IQR) of both groups and compared medians using Mann–Whitney U test.

Results

The current study included 401 patients who had a confirmed diagnosis of COVID-19 from a non-intensive care unit setting. None of the patients died and none of them previously had either MERS-CoV or SARS-CoV. The age ranged from 7 months to 88 years and was divided into four age groups. There were 16 (4%) in Group I, 309 (77%) in Group II, 51 (12.7%) in Group III, and 25 (6.3%) in Group IV). The median (IQR) age was 10.5 (1.5–16) in group I, 34 (29–41) in group II, 53 (51–56) in group III, and 66 (61–76) in group IV. The majority of our patients were male (80%, n = 322), as compared to females (20%, n = 80), and of those only one was pregnant. Gender was similar across all age groups with a male to female ratio of 4:1 in the total population. The patients were mostly of Arabian and Asian descent (48.4% and 49.6% respectively), with a few patients of African (1.2%), Turkish (0.2%), and American (0.5%) descent. Among these patients, the severity of the patients was mostly mild (60.1%) to moderate (39.9%).

Most patients (92.3%, n = 370) were non-smokers, 23 (5.7%) were smokers and 8 (2%) were former smokers. The mean length of stay in the hospital was 12.26 ± 6.79 days (range 3–42 days). Moreover, 315 (78.6%) of the study population was admitted to the ward, 4.5% (18) were transferred to government hospitals and 68 (17%) were discharged. The difference in the length of hospital stay across the age groups was significant (Table 1).

Clinical characteristics are depicted in Table 2. The most common symptoms were cough (53.6%), fever (36.2%), fatigue (26.4%), dyspnea (21.9%), sore throat (21.9%), headache (16.2%), muscle pain (14.5%), joint pain (9.2%), sputum production (7.7%), and diarrhea (7.7%). Comorbidities were present in 112 (27.9%) patients, with hypertension being the most common (14.7%), followed by obesity (11.5%), and diabetes (10%).

Table 2
Clinical characteristics of the study population.

Clinical characteristics		All patients (n = 401)
Fever		145 (36.2%)
Cough		215 (53.6%)
Fatigue		106 (26.4%)
Headache		65 (16.2%)
Diarrhea		31 (7.7%)
Shortness of breath		88 (21.9%)
Muscle pain		58 (14.5%)
Joint pain		37 (9.2%)
Sore throat		88 (21.9%)
Rhinorrhea		29 (7.2%)
Anosmia		19 (4.7%)
Dysgeusia		22 (5.5%)
Hyposmia		3 (0.7%)
Anorexia		13 (3.2%)
Nausea		27 (6.7%)
Vomiting		17 (4.3%)
Sputum production		31 (7.7%)
Hypertension		60 (14.7%)
Diabetes		41 (10.0%)
Cardiologic diseases		11 (2.7%)
Respiratory disorders		15 (3.7%)
Chronic kidney disease		1 (0.2%)
Dyslipidemia		19 (4.7%)
Immunodeficiency		1 (0.24%)
Obesity	Not obese	355 (88.5%)
	Class I	34 (8.5%)
	Class II	10 (2.5%)
	Class III	2 (0.5%)

Amongst the clinical symptoms, only sputum production differed across age groups, with the highest incidence in group IV (25% vs. 6.3–8.9%). Comorbidities such as hypertension, diabetes, cardiological disorders, and dyslipidemia were also more prevalent in group IV. There was only one patient each of chronic kidney disease and immunodeficiency in our study population. Obesity was similar across all the age groups. The comparison of the clinical characteristics across the age groups is shown in Table 3.

Of all patients, 60 (14.7%) had hypertension. Clinical symptoms in hypertensive and non-hypertensive patients are given in Table 4. Interestingly, patients with a history of hypertension were less likely to present with shortness of breath, cough, sputum, and fever. There was a significant difference ($p = 0.033$) in the hospital length of stay between hypertensive and non-hypertensive patients: 14 days (IQR 9–22) versus 10 days (IQR 8–15) respectively.

Of all patients, 41 (10.0%) had diabetes. Clinical characteristics in diabetic and non-diabetic patients are detailed in Table 5. All clinical symptoms were more prevalent in diabetic patients as

Table 3
Comparison of clinical characteristics between the age groups (n = 401).

Clinical characteristic	(0-<18y) n = 16	Group I (18-<50y) n = 309	Group II (50y-60y) n = 51	Group III (>60y) n = 25	Group IV	P-value
Fever		5 (31.3%)	106 (34.3%)	24 (42.9%)	10 (50.0%)	0.337
Cough		6 (37.5%)	162 (52.4%)	32 (57.1%)	15 (75.0%)	0.122
Fatigue		3 (18.8%)	81 (26.2%)	13 (23.2%)	9 (45.0%)	0.227
Headache		3 (18.8%)	53 (17.2%)	4 (7.1%)	5 (25.0%)	0.187
Diarrhea		4 (25.0%)	26 (8.4%)	1 (1.8%)	–	0.10
Shortness of Breath		3 (18.8%)	60 (19.4%)	19 (33.9%)	6 (30.0%)	0.082
Muscle Pain		1 (6.3%)	49 (15.9%)	6 (10.7%)	2 (10.0%)	0.509
Joint Pain		1 (6.3%)	31 (10.0%)	5 (8.9%)	–	0.485
Sore Throat		1 (6.3%)	73 (23.6%)	11 (19.6%)	3 (15.0%)	0.315
Rhinorrhea		1 (6.3%)	23 (7.4%)	4 (7.1%)	1 (5.0%)	0.979
Anosmia		1 (6.3%)	15 (4.9%)	2 (3.6%)	1 (5.0%)	0.967
Dysgeusia		1 (6.3%)	17 (5.5%)	3 (5.4%)	1 (5.0%)	0.999
Hyposmia		–	3 (1%)	–	–	0.825
Anorexia		1 (6.3%)	9 (2.9%)	2 (3.6%)	1 (5.0%)	0.853
Nausea		1 (6.3%)	24 (7.8%)	2 (3.6%)	–	0.413
Vomiting		2 (12.5%)	14 (4.5%)	1 (1.8%)	–	0.215
Sputum Production		1 (6.3%)	20 (6.5%)	5 (8.9%)	5 (25.0%)	0.027
Hypertension		1 (6.3%)	27 (8.7%)	23 (41.1%)	9 (45.0%)	**<0.0001**
Diabetes		–	17 (5.5%)	14 (25.0%)	10 (50.0%)	**<0.0001**
Cardiological Diseases		–	3 (1.0%)	3 (5.4%)	5 (25.0%)	**<0.0001**
Respiratory Disorders		1 (6.3%)	8 (2.6%)	3 (5.4%)	3 (15.0%)	**0.031**
Chronic Kidney Disease		1 (6.3%)	–	–	–	**<0.0001**
Dyslipidemia		–	6 (1.9%)	6 (10.7%)	7 (35.0%)	**<0.0001**
Immunodeficiency		–	1 (0.3%)	–	–	0.960
Obesity	No	14 (87.5%)	274 (88.7%)	45 (88.2%)	22 (88.0%)	0.995
	Class I	2 (12.5%)	25 (8.1%)	5 (9.8%)	2 (8.0%)	
	Class II	–	8 (2.6%)	1 (2.0%)	1 (4.0%)	
	Class III	–	2 (0.6%)	–	–	

Frequencies and percentages are given for categorical data; Median (IQR) for non-normally distributed data. A p-value of <0.05 is considered significant.
The bold values are the significant p-values that are <0.05.

Table 4
Clinical characteristics of hypertensive and non-hypertensive patients.

Clinical Characteristics	Patients with hypertension	Patients without hypertension	P-Value
Fever	29 (20%)	116 (80%)	**0.025**
Cough	39 (18.1%)	176 (81.9%)	**0.05**
Fatigue	21 (19.8%)	85(80.2%)	0.10
Headache	9 (13.8%)	56 (86.2%)	0.78
Diarrhea	8 (25.8%)	23 (74.2%)	**0.07**
Shortness of breath	24 (27.3%)	64 (72.7%)	**0.0001**
Muscle pain	9 (15.5%)	49 (84.5%)	0.89
Joint pain	5 (13.5%)	32 (86.5%)	0.79
Sore throat	11 (12.5%)	77 (87.5%)	0.46
Rhinorrhea	4 (13.8%)	25 (86.2%)	0.85
Anosmia	2 (10.5%)	17 (89.5%)	0.57
Dysgeusia	4 (18.2%)	18 (81.8%)	0.66
Hyposmia	0 (0%)	3 (100%)	0.46
Anorexia	3 (23.1%)	10 (76.9%)	0.40
Nausea	6 (22.2%)	21 (77.8%)	0.27
Vomiting	3 (17.6%)	14 (82.4%)	0.75
Sputum production	10 (16.7%)	21 (67.7%)	**0.005**

The bold values are the significant p-values that are <0.05.

compared to non-diabetic patients, with a statistically significant difference in fatigue, diarrhea, shortness of breath, and sputum production. The average hospital length of stay did not differ between diabetic patients and non-diabetics: 9 days (IQR 5–17) versus 10 days (IQR 8–17) respectively ($p = 0.56$).

Discussion

This study summarizes the demographics and clinical characteristics of COVID-19 patients admitted at five private tertiary care hospitals in Riyadh, Saudi Arabia. We wanted to highlight the presence of COVID-19 features in very young people, especially in Saudi Arabia, as some studies around the world are suggesting above 50 years as a high-risk factor, while others suggest more than 60 as a high-risk factor [12–16]. The age range of our patients varied from 7 months to 88 years, which indicates that all age groups are susceptible to COVID-19. However, 77% were between 18 and <50 years of age, and only 16 were under the age of 18. Wei et al. reported nine infected infants of which seven were female, and four of them presented with fever [17]. More recently, a larger study was conducted on the pediatrics population indicating that most of the patients were either asymptomatic, mild, or moderate cases with time from illness onset to diagnoses range of 0–42 days [18]. Our study concurs with these studies that younger age is not immune to COVID-19 susceptibility. We should be cautious as children being less symptomatic would usually not present to the hospital. They may be more prevalent in society as asymptomatic carriers and may contribute to spreading COVID-19.

Table 5
Clinical features in diabetic versus non-diabetic patients.

Characteristics	Patients with diabetes	Patients without diabetes	P-Value
Fever	129 (89%)	16 (11%)	0.68
Cough	189 (87.9%)	26 (12.1%)	0.184
Fatigue	88 (83%)	18 (17%)	**0.007**
Headache	57 (15.8%)	8 (19.5%)	0.54
Diarrhea	24 (77.4%)	7 (22.6%)	**0.018**
Shortness of breath	72 (81%)	16 (18.2%)	**0.005**
Muscle pain	49 (84.5%)	9 (15.5%)	0.15
Joint pain	30 (81.1%)	7 (18.9%)	**0.06**
Sore throat	81 (92%)	7 (8%)	0.42
Rhinorrhea	26 (89.7%)	3 (10.3%)	0.92
Anosmia	18 (94.7%)	1 (5.3%)	0.46
Dysgeusia	19 (86.4%)	3 (13.6%)	0.58
Hyposmia	3 (100%)	0	0.55
Anorexia	12 (92.3%)	1 (7.7%)	0.75
Nausea	24 (88.9%)	3 (11.1%)	087
Vomiting	14 (82.4%)	3 (17.6%)	0.28
Sputum production	21 (67.7%)	10 (32.3%)	**<0.0001**

The bold values are the significant p-values that are <0.05.

The median age of the included patients in this study was 36 (IQR: 30–45) years, while other studies had an older population with median ages ranging from 37 to 70.5 years [15,16]. This is identical to the only other published study of the Saudi population which showed the median age of all COVID-19 patients was 36 years [19]. From the Middle East, a study of 63 patients from Oman showed a mean age of 48 $\pm$ 16 years [20]. Most of our patients were also men (female to male ratio 1:4) which is in concordance to the published literature from China, the United States, and the United Kingdom [15,16,21–24]. As seen in studies for MERS-CoV and SARS-CoV, SARS-CoV-2 is more likely to infect adult men [9,25]. This might be due to the X chromosome and sex hormones present in women that play a protective role (via innate and adaptive immunity) in susceptibility to viral infections [26].

SARS-CoV-2 has an incubation period of 1–14 days and multiple studies have reported that patients mostly present with fever, cough, sputum, and fatigue [15,16,22,27]. The estimated median incubation period of SARS-CoV-2 was recently reported to be 6 days in Saudi Arabia [19]. Concordantly, in our study, the most common presenting symptoms were cough, fever, and fatigue. It is important to note that Alsofayan et al. also reported that cough and fever were the most common symptoms in the Saudi population, with the only difference being high prevalence of sore throat (81.6%) [19]. Although sputum production seemed to be increasing with age, generally it was a less frequently occurring symptom in our study population. This may be due to the fact that the majority of our patients were lesser than the age of 60 years, in contrast to other studies [15,16,21,22,24]. The prevalence of cough was also more in older age groups, however, the difference across age groups was not statistically significant. In addition, gastrointestinal symptoms were also present in our patients including diarrhea (7.7%), nausea (6.7%), and vomiting (4.3%).

MERS-CoV had shown to survive in the gastrointestinal juice and up to 30% of MERS-CoV patients had diarrhea [28,29]. There have been reports showing the presence of SARS-CoV-2 in stool samples of asymptomatic and symptomatic patients [30,31]. A recent study concluded that patients with digestive symptoms were more likely to be fecal virus positive (73.3% vs 14.3%, $P = 0.033$) than those with respiratory symptoms, and with a longer interval between symptom onset and viral clearance ($P < 0.001$) [32]. Hence, we should not neglect patients with gastrointestinal symptoms and we may test their stool samples for viral RNA to reduce false-negative diagnoses.

Consistent with previous studies, hypertension was the most common comorbidity seen in our patients, followed by diabetes [15,19,20,22,33]. We need to be persistently vigilant because 67.9% of the deceased COVID-19 patients in Italy had hypertension [34]. However, our findings showed that hypertensive patients had milder symptoms and a shorter length of stay. The reason for this is unclear as history of angiotensin-converting enzyme inhibitor or angiotensin II receptor blockers use has exceptionally low evidence in predicting outcomes in COVID-19 [35]. Other common comorbidities seen were cardiovascular disease, and dyslipidemia, which were also higher in group IV of our patients. Contrary to our findings, Docherty et al. reported a large group of patients in the UK which had chronic pulmonary and kidney diseases as major comorbidities [24]. Additionally, obesity was recorded in 11.5% of our patients, which was not described in the recent study of the Saudi population [19]. Obesity is a growing health concern in the Saudi population and an underappreciated risk factor for COVID-19 as depicted in data from the United States [36,37]. Young obese COVID-19 patients may be at risk of disease progression as obese patients can potentially have impairment of ventilation with restrictive diaphragmatic and rib mobility, along with an impaired immune response to viruses and also increased oxidative stress in patients [38,39].

There are several limitations of this retrospective study. Firstly, the cross-sectional nature of our study lacks the advantage of follow-up in a longitudinal study to see the course of the disease. Moreover, although we summarized the clinical characteristics for mild and moderate cases of COVID-19, there is still a lack of a prediction model for disease severity progression, and also case fatality, since none of our patients had severe COVID-19 and none had died. Secondly, lymphopenia and other lab values are common in COVID-19 patients and have been reported in other studies published elsewhere in the world. Therefore, it would be useful if we could also consider doing a study with the laboratory and radiological findings in COVID-19.

Conclusion

We tried to assess the burden of COVID-19 in patients in Saudi Arabia by analyzing their clinical characteristics. The most common presenting symptoms were cough, fever, and fatigue for mild to moderate COVID-19 patients. Sputum production and different comorbidities including hypertension and diabetes were predominantly seen in the older age group. Remarkably, patients with a history of hypertension had a lesser length of stay and were less likely to present with shortness of breath, cough, sputum, and fever. Further larger collaborative national studies are essential to understand the clinical characteristics of COVID-19 in Saudi Arabia, which will eventually help in more effectively controlling the spread of SARS-CoV-2 in our region.

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Competing interests

None declared.

Ethical approval

The study was approved by Dr. Sulaiman Al Habib Medical Group Institutional Review Board, reference number (RC20.04.79).

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