Research Article

Epidemiology and Clinical Characteristics of COVID-19 patients in Al-Shaikh Zayed Hospital in Baghdad in 2020

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ABSTRACT

INTRODUCTION: Coronavirus disease (COVID-19) is caused by SARS-COV2 and represents the causative agent of a potentially fatal disease of great global public health concern.

OBJECTIVE: To assess endpoint outcomes, recovery or death, of patients with COVID-19 who were admitted to Al Shaikh Zayed Hospital in Baghdad during August, September, and October 2020. And to measure factors that may associate with these outcomes.

METHODS: A Prospective case series was conducted on 352 consecutive hospitalised patients with confirmed coronavirus disease at Al-Shaikh Zayed Hospital in Baghdad, Iraq, from August 1 to October 30, 2020. Epidemiological, demographic, clinical, radiological, and treatment data were collected and analysed. Outcomes of the patients as recovery, death, and still hospitalisation were collected and analysed to find any association between the outcomes and the demographic and clinical data.

RESULTS: The median (IQR) and mean±SD in days of the symptom onset for recovered patients were 4.5 (3-7) and 4.95±2.424, and 7 (3-10) and 8.05± 3.5 for dead patients, respectively. The median (IQR) and mean±SD in days for hospitalisation of the recovered patients were 5 (3-10) and 7.40± 6.7, and 2 (0-4) and 3.12±3.46 for dead patients, respectively. Infection with covid-19 and its mortality were more common in males than females. The median (IQR) age of all patients enrolled in the study was 54 (40-67) years, the mean was 52.99±17.8 years, and the range of 18-93 years. In 173(49.15%) patients, co-morbid diseases were reported. Most cases presented with fatigue/malaise, fever and shortness of breath (SOB). Myalgia, fatigue, cough, SOB and vomiting vary with age. Out of all patients enrolled, 84 (23.9%) were transferred to the ICU; six recovered, 69 died, and nine were still hospitalised at the end of the study. We reported complications in 60 (17.1%) patients, 49 (14%) of them have died.

CONCLUSION: middle-aged-elderly male patients admitted with severe or critical conditions are susceptible to complications, worsened in a short time and have an increased risk of mortality. The onset of illness may help physicians identify patients with poor prognoses.

Key words: COVID-19, comorbidity, mortality, Iraq.

INTRODUCTION

Coronaviruses are a family of viruses that can cause illnesses such as the common cold, severe acute respiratory syndrome (SARS), and the Middle East respiratory syndrome (MERS). In 2019, a new coronavirus caused a disease outbreak in China.[1] In December 2019, several cases of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections were first reported in China.[2]

WHO officially named the virus Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) and the disease Coronavirus Disease 2019 (COVID-19).[3] The illness usually manifests as respiratory symptoms and sometimes as gastrointestinal symptoms. The clinical spectrum of the disease varies from no symptoms, mild respiratory symptoms, severe and rapidly progressive pneumonia, acute respiratory distress syndrome, septic shock, or multi-organ failure resulting in death.[4,5] COVID-19

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is associated with inflammation, a prothrombotic state, increases fibrin, fibrin degradation products, fibrinogen, and D-dimers. In some studies, elevations in these markers are associated with worse clinical outcomes.[6] In 20% of the infected patients, the disease may become more severe with complications like breathing difficulties, pneumonia, and heart and kidney failure. Old patients and co-morbidities such as hypertension, diabetes, cancer, and heart problems are more likely to develop these serious complications.[5] COVID-19 is mainly transmitted by droplets and contact with contaminated surfaces or objects.[3,7] It is associated with high hospitalisation rates, and many estimates suggest that 5%–30% of patients are admitted to an intensive care unit (ICU).[8] The severe contagiousness and rapid disease progression of the 2019 coronavirus disease (COVID-19) have drawn significant global public health attention.[2,8]

After nearly two years (December 2019 to December 2021), coronavirus disease 2019 (COVID-19) continues to circulate and change widely. It has affected more than 330 million people and has led to the death of more than 5 million people.[9]

Iraq is one of the countries most affected by the Covid-19 epidemic in the Middle East. On 1 August 2020, when starting this study, the total confirmed COVID-19 cases reached more than 126704, including more than 4805 deaths among its population of 40 million people. On 9 February 2022, when writing this study, the total confirmed COVID-19 cases reached 2,26 million, including more than 24,600 deaths.[10]

COVID-19 is an emerging pandemic nowadays. It is vital to report demographics, clinical features, and outcomes of treatment of patients infected with this disease not only to offer treatment but also to predict the potential pandemic in the future.

This study aimed to describe the epidemiological and clinical features of patients with COVID-19 who were admitted to Al-Sheikh Zayed General Hospital in Baghdad from 1 August to 31 October 2020 and determine the association between these features and the outcomes of treatment.

METHODS

Study design& Setting: This prospective case series was conducted at Al-Sheikh Zayed General Hospital in Baghdad over three months, from 1/08/2020 to 31/10/2020. Al-Sheikh Zayed General Hospital is a governmental hospital of Al-Rusafa Health Directorate with 105 beds; it is located on Al-Rusafa side of the Tigris River in the eastern part of Baghdad.[12] It is allocated to admit patients with covid-19 who need intrahospital care for initial evaluation and care provision. The hospital does not have ICU or RCU department, so severe and critical cases are referred to either Ibn Alkateeb or Ibn Zuher hospitals for further care and management.

Ethical consideration: The research ethics committee at Al-Rusafa Health Directorate approved the protocol of this study. The authors took the official agreement of the hospital administration to use the patients' records.

Inclusion and exclusion criteria: We enrolled 383 patients diagnosed with Covid-19 by real-time RT-PCR and admitted to Al Shaikh Zayed Hospital in Baghdad from 1 August 2020 to 31 October 2020. Patients with mild or moderate COVID-19 who were admitted to the hospital for any other reason were included in this study. Epidemiological, demographic, clinical, treatment, and outcomes data were collected and analysed. We excluded 31 patients due to missing data, and the analysis was done for 352 patients.

Data Collection: Some data were obtained from the patients, and the clinical data were obtained from the records filled out by the treating physicians. The authors retrieved the data into a form designed for this purpose. During the study period, the researcher followed up with the patients almost daily to complete the required information. Patients with severe or critical illness were transferred to the ICU or RCU of the drainage hospitals mentioned

above. The outcomes of these patients were obtained through the communications of the researcher with the healthcare workers from inside those hospitals. The data were reviewed and analysed by the research team.

Variables and the outcomes: we extracted the following variables:

1. Demographic features of the patients like age, gender, and occupational status.
2. Co-morbidities; Diabetes mellitus, hypertension, ischaemic heart disease, asthma, chronic kidney disease, chronic liver disease and malignancy.
3. Signs and symptoms include fever, headache, sore throat, myalgia/arthralgia, fatigue/malaise, cough, diarrhoea, shortness of breath, vomiting/nausea, and loss of taste and/or smell.
4. Treatment used. The hospital adopted the Iraqi national clinical management and treatment of COVID-19 in August- September 2020.[12]
5. The severity of COVID-19 was classified into ***1) Mild***, which is defined as mild clinical symptoms without clinical or radiological signs of pneumonia, ***2) Moderate***, defined as fever, respiratory symptoms, imaging manifestations of pneumonia, systemic manifestations, but without respiratory failure ***3) Severe***, patient meets any of the following criteria: **A)** respiratory distress RR>than 30/min in adult **B)** blood oxygen saturation less than 93% on ambient air, **C)** PaO2/FiO2 less than 300 and **D)** Lung infiltrate >50% of the lung field within 24hr) and ***4) Critical*** (symptoms of one or more of the following: (ARDS, sepsis, altered consciousness, multi-organ failure, respiratory failure requiring mechanical ventilation).[12]
6. Outcomes of the disease; discharge home, length of hospital admission, and death.
7. We recorded the number of days the patient stayed at the hospital and the duration from disease onset to hospital admission.

Statistical analysis: Data are presented as numbers and percentages for categorical data, mean ± standard deviation for normally distributed continuous data, and median for skewed data. Proportions for categorical variables were compared using the X^2 test. The correlation of the two variables was compared using the Pearson Chi-Square. P-values < 0.05 were con¬sidered statistically significant. All statistical analyses were performed using SPSS (Statistical Package for the Social Sciences) version 24.0 software (SPSS Inc).

RESULTS

Of 383 hospitalised patients with confirmed COVID-19, 352 (91.9 %) patients had complete records and were included in our analysis.

Table 1 shows the demographic and clinical features of the participants with their association with the outcomes. The median of age + IQR in years was 54 (40-67), and males were 227 (64.5 %). About half of the participants, 173 (49.15 %), had co-morbidities; hypertension was the most commonly reported in 113 (32.1 %). Complications were reported in 60 patients (17.1 %), and 84 (23.9 %) required RCU/ ICU. Age, male gender, having co-morbidities, especially hypertension, cardiovascular, respiratory, DM, and malignancies, have a statistically significant association. Similarly, having complications during hospitalisation, prolonged hospitalisation, smoking history, lung involvement by CT scan of the chest, having treatment with immunoglobulins, CPAP, and need for ICU admission all have a statistically significant association with the outcomes.

Distribution of the patients according to the outcomes; 208 (59.1 %) were discharged home after recovery, 130 (36.9 %) patients died, and 14 (4 %) were still hospitalised under care (Till the date of analysis 31 October 2020. See table 2.

Table 3 shows the frequency of some symptoms and signs reported by patients with COVID-19 and their association with the outcomes. The commonest symptom was fatigue/malaise reported in 296 (84.1 %), followed by fever in 266 (75.6 %), while the least were diarrhoea and nausea and vomiting, reported by 40 (11.4

Table 1 | Demographic and general characteristics of 2019-novel corona virus-infected patients included in the study (N = 352).

Features		N (%)	Recovered (%)	Died (%)	Still hospitalised (%)	P value
		Total: 352	Total: 208(59.1)	Total: 130 (36.9)	Total: 14 (4)	
Age in years	Median (IQR)	54(40-67)	45 (30-58)	65 (55-75)	65.5(57-73)	0.000
	Mean ± SD	52.99±17.8	44.75±15.75	64.87±13.55	65±11.44	0.000
Gender	Male	227(64.5%)	130(62.5%)	92(70.8%)	5(35.7%)	0.022
	Female	125(35.5%)	78(37.5%)	38(29.2%)	9(64.3%)	
Co-morbidities		173(49.15%)	67(32.2%)	94(72.3%)	12(85.7%)	0.000
	Hypertension	113(32.1%)	47(22.6%)	58(44.6%)	8(57.1%)	0.000
	Diabetes Millitus	85(24.2%)	26(12.5%)	52(%)	7(50%)	0.000
	Heart diseases	55(15.6%)	12(5.8%)	34(26.2%)	9(64.3%)	0.000
	Respiratory diseases	17(4.8%)	5(2.4%)	11(8.5%)	1(7.1%)	0.038
	Others	4(1.1%)	3(1.4%)	1(0.8%)	0	0.783
	Neurological disease	2(0.6%)	1(0.5%)	1(0.8%)	0(%)	0.904
	Malignancy	2(0.6%)	1(0.5%)	0	1(7.1%)	0.003
Complications		60(17.1%)	5(2.4%)	49(37.7%)	6(42.9%)	0.000
	ARDS	12(3.4%)	0	10(7.7%)	2(14.3%)	
	Sudden death	9(2.6%)	0	9(7%)	0	
	Shock	11(3.1%)	2(1%)	9(7%)	0	
	Elevated blood sugar	1(0.3%)	1(0.4%)	0	0	
	Uncoded organ failure	27(7.7%)	2(1%)	21(16.2%)	4(28.6%)	
Onset of Symptom (days)	median (IQR)	5(4-7) days	4.5 (3-7) days	7 (3-10) days	7 (4-7) days	0.000
	Mean ± SD	6.15±3.22	4.95±2.42	8.05±3.49	6.36±2.59	
Hospitalization (days)	median (IQR)	4(2-7) days	5 (3-10) days	2 (0-4) days	4(5-10) days	0.02
	Mean ± SD	5.77±5.94	7.4±6.66	3.12±3.46	6.21±3.88	
Lung involvement (infection) CT scan		283(80%)	139(66.8%)	130(100%)	14(100%)	0.000
Illness severity	Mild	117(33.2%)	117(56.2%)	0	0	0.000
	Moderate	69(19.6%)	68(32.7%)	0	1(7.1%)	
	Severe	48(13.6%)	23(11.1%)	17(13.1%)	8(57.1%)	
	Critical	118(33.5%)	0	113(86.9%)	5(35.7%)	
Required RCU or ICU		84(23.9%)	6(2.9%)	69(53.1%)	9(64.3%)	0.000
Treatment	Antibacterial	352(100%)	208(100%)	130(100%)	14(100%)	----
	Antiviral	352(100%)	208(100%)	130(100%)	14(100%)	----
	Glucocorticoids	152(43.2%)	49(23.6%)	92(70.8%)	9(64.3%)	0.000
	Human immunoglobulin G	53(15.1%)	29(13.9%)	17(13.1%)	7(50%)	0.001
	CPAP	90(25.6%)	9(4.3%)	73(56.2%)	8(57.1%)	0
Smoking history		172(48.9%)	117(56.3%)	51(39.2%)	4(28.6%)	0.003

Table 2 | Association of the outcomes to the severity of the infection

		Outcomes			
Illness severity	**Total (%)**	**Recovered**	**Died**	**Still Hospitalization**	**P value**
Mild	117 (33.2%)	117 (56.2%)	0	0	0.000
Moderate	69 (19.6%)	68 (32.7%)	0	1(7.1%)	
Severe	48 (13.6%)	23 (11.1%)	17 (13.1%)	8 (57.1%)	
Critical	118 (33.5%)	0	113 (86.9%)	5 (35.7%)	

Table 3 | Clinical manifestations and physical signs of 2019-novel coronavirus infected patients (N = 352) and the patient's outcomes.

Initial symptom	Frequency (%)	Recovered	Died	Still hospitalization	P value
Fatigue/malasia	296 (84.1%)	168 (56.8%)	115 (38.9%)	13 (4.4%)	0.112
Fever	266 (75.6%)	153 (57.5%)	101 (38%)	12 (4.5%)	0.460
Sore throat	216 (61.4%)	141 (65.3%)	65 (30.1%)	10 (4.6%)	0.004
Shortness of breath	214 (60.8%)	87 (40.7%)	117 (54.7%)	10 (4.7%)	0.000
Cough	172 (48.9%)	91 (52.9%)	70 (40.7%)	11 (6.4%)	0.015
Headache	150 (42.6%)	85 (56.7%)	55 (36.7%)	10 (6.7%)	0.081
Loss of taste and or smell	121 (34.4%)	78 (64.5%)	39 (32.2%)	4 (3.3%)	0.331
Myalgia/Arthralgia	96 (27.3%)	34 (35.4%)	55 (57.3%)	7 (7.3%)	0.000
Diarrhoea	40 (11.4%)	19 (47.5%)	21 (52.5%)	0	0.056
Vomiting/Nausea	11 (3.1%)	11 (100%)	0	0	0.020

Table 4 | Association of age and co-morbidity to the outcomes

Patients' outcomes	Age groups in years	Without co-morbidity (%)	With co-morbidity (%)	Total (%)	P value
Recovered	18-49	104 (73.8)	19 (28.4)	123 (59.1)	0.00
	50-65	28 (19.9)	31 (46.3)	59 (28.4)	
	>65	9 (6.4)	17 (25.4)	26 (12.5)	
	Total	141 (67.8)	67 (32.2)	208 (59.1)	
Died	18-49	6 (16.7)	16 (17)	22 (16.9)	0.006
	50-65	13 (36.1)	30 (32)	43 (33.1)	
	>65	17 (47.2)	48 (51.1)	65(50)	
	Total	36 (27.7)	94 (72.3)	130 (36.9)	
Still Hospitalization	18-49	0	2 (16.7)	2 (14.3)	0.647
	50-65	1 (50)	4 (33.3)	5 (35.7)	
	>65	1 (50)	6 (50)	7 (50)	
	Total	2 (14.3)	12 (85.7)	14 (4)	
Total		179 (50.9)	173(49.1)	352 (100)	0

%) and 11 (3.1%), respectively. Sore throat, shortness of breath, cough, myalgia/arthralgias, and nausea/vomiting were significantly associated with the outcomes.

Figure 1 shows the distribution of the outcomes according to the severity. Mild cases were reported in 117(33.2%), moderate in 69 (19.6%), severe in 48 (13.6%), and critical in 118(33.5%). All the mild cases were recovered, while (17 out of 48) severe cases and (113 out of 118) critical cases died. These results showed a statistically significant association between the severity of the patient's illness, age, and COVID-19 infection outcomes.

Table 4 shows the distribution of the outcomes according to the presence or absence of the co-morbidities and the age. Recovery and death from covid-19 showed statistically significant association with the age and co-morbidities, p value 0.000 and 0.006 respectively.

Table 5 shows that gender and having a job affected the outcomes in general, p value 0.00.

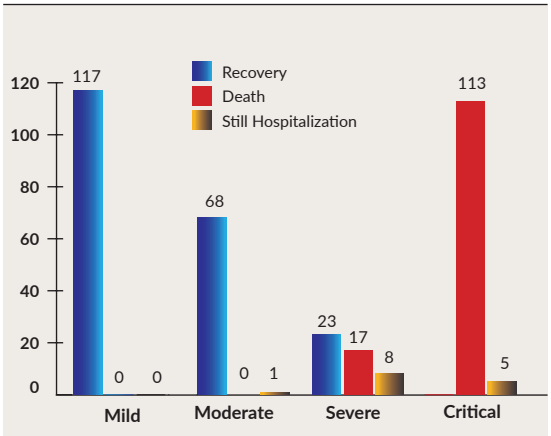

Figure 1 | the outcomes according to the severity.

Table 5 | Relation between patient's occupation status, gender and COVID-19 disease outcomes.

Outcomes		Occupation status			P value
	Gender	Jobless	Has a Job	Total	
Recovery	Female	41	37	78	0.00
	Male	29	101	130	
Total		70	138	208	
Death	Female	35	3	38	0.00
	Male	35	57	92	
Total		70	60	130	
Still hospitalized	Female	8	1	9	0.275
	Male	3	2	5	
Total		11	3	14	
Total	Female	84	41	125	0.00
	Male	67	160	227	
Total		151	201	352	

Recovery and death, but not still hospitalization were have shown a statistically significant association with job, p-value 0.00.

DISCUSSION

We reported that about two-thirds of the patients with COVID-19 were males, 227 (62.5 %), and 92 (70.8) patients who died of COVID-19 were males, with a p-value of 0.02. Many studies reported similar findings.[13,14] These findings might be explained by:

1. More public exposure of males tending them more prone to acquiring SARS-CoV2 infection.[15]
2. More expression of ACE2 in males than in females makes males more susceptible to COVID-19.
3. X chromosomes and sex hormones play an essential role in innate and adaptive immunity in females.
4. Females are less associated with a bad lifestyle than males;[14] Women had healthier dietary habits, a higher rate of moderate-vigorous physical activity, and a lower rate of smoking, alcohol consumption and obesity than men.[16, 17, 18]

We found that the median age was 54 years with an interquartile range of 40-67; a mean of 52.99±17.8 with a range of 18-93 years. A similar result was seen in other studies.[19, 20, 21]

In our study, the most common symptom at the onset of illness was fatigue/malaise (84.1%), followed by fever (75.6%), sore throat (61.4%), shortness of breath (60.8%), Cough (48.9%) and Headache (42.6%). Less common symptoms were loss of taste and or smell sense, myalgia/Arthralgia, Diarrhoea and vomiting / Nausea. Our findings were consistent with the existing evidence reported by many studies.[3, 13, 22]

We found that the median (IQR) and mean±SD in days for onset of the symptoms for recovered patients were 4.5 (3-7) and 4.95±2.424, and 7 (3-10) and 8.05± 3.5 for dead patients respectively. An earlier physician consultation improves the outcome by helping physicians identify patients with poor prognoses.[19]

We found that the recovered patients had median hospitalisation days of 5 (IQR 3-10) days; a mean of 7.40± 6.6 vs 2 (0-4); a mean of 3.12±3.46 days for the dead patients suggesting that the deterioration is rapid in patients with COVID-19. In our study, about half of patients infected by SARS-CoV-2 had chronic underlying diseases, mainly hypertension, diabetes, cardiovascular diseases, and respiratory diseases. And these co-morbidities showed a statistically significant association with the outcome; other studies showed sim-

ilar results.[15, 24] Our results suggest that SARS-CoV-2 is more likely to infect elderly males with chronic co-morbidities due to the weaker immune functions of these patients.[24]

Our study reported severe complications developed in 60 (17.1%) patients with SARS-CoV-2 during hospitalisation; 12 (3.4%) had ARDS. A study from China found complications in 33% of patients with SARS-CoV-2 during treatment; 17 (17%) developed ARDS.[24] We have fewer ARDS than in the Chinese study; the explanation could be because we referred patients with severe and critical illnesses who need ICU to other hospitals; in addition, our study reported 27(7.7%) as uncoded organ failure, which might include ARDS in at least part of them. We found that the majority of these complications, 57(16.2%), were developed among those aged 40 years and older, and 44(12.2%) had co-morbid diseases; most had hypertension and diabetes. Early studies mentioned that nearly 40% of the patients have at least one medical chronic illness on admission. The most common complications during treatment included ARDS, shock, acute cardiac injury, arrhythmia, kidney injury, and liver dysfunction. [23]

Patients with hypertension and diabetes mellitus have higher expression levels of ACE-2, a functional receptor for SARS-CoV-2 to which the virus spike proteins bind, and it is highly expressed in the heart and lungs. In addition, the expression of ACE-2 has also been found in kidneys, testes, bladder, liver, stomach, intestinal epithelium, and vascular endothelium. This increases the likelihood of more severe complications such as acute lung injury, acute myocarditis and multi-organ dysfunction during COVID-19 infection among individuals with these existing co-morbidities. [25, 11, 26, 26]

The reported association between hypertension and worse clinical outcomes could be due to vascular ageing, diminished renal function, the presence of non-adjusted co-morbid conditions, or the effect of medications. Alternative mechanisms underlying the worse clinical outcomes in patients with cardiovascular disease may include more advanced age, reduced cardiopulmonary reserves, dysregulation of the immune system, and intolerance of viral-mediated cytokine storm.[11]

Of the 352 patients included in our study, 84 (23.9%) required ICU, 208(59.1%) patients recovered and were discharged home, 130(36.9%) patients died, and 14(4%) patients were still hospitalised.

This study observed that 208(59.1%) COVID-19 patients recovered and were discharged home, and 184 (52.3%) were mild to moderate severity. Most recovered patients were young in the age group of 18-49y, two-thirds without co-morbid diseases. The cause of admission of patients with mild and moderate severity infection was isolation and clinical monitoring because it is mandatory in Iraq to admit all COVID-19 patients to prevent transmission to other individuals. Similar studies conducted in Wahan, China and Georgia, USA reported (31%), (76.4%) respectively.[25, 28]

The mortality rate in our study was 36.9% (130 out of 352), which is higher than that reported in a study conducted in Cameron (32%)[29] and much higher than that reported in other studies conducted in Saudi Arabia and China 11.6% and 0.92%, respectively.[9,30] Studies have suggested that old age and co-morbidities are risk factors for death in COVID-19 patients.[31, 9, 32]

In our study, half of the dead patients were over 65 years old, 94 out of 130 (72.3%) had an underlying disease, and 22(16.9%) developed severe complications. Older patients are more vulnerable to COVID-19 pneumonia. It has been proposed that older patients have weakened innate immunity accompanied by an over-reactive adaptive immune system induced by SARS-CoV2, which leads to inflammatory responses like the “cytokine storm,” causing complications including pneumonitis and acute respiratory distress syndrome (ARDS).[26] In addition, patients were afraid of being quarantined, denied the infection and reluctant to visit hospitals until they became very severe. We observed that 84 (23.9%) of COVID-19 patients required ICU; about half of them, 53.1 % (69 out of 130), died. Other studies conducted

in India and Saudia Arabia reported COVID-19 mortality in ICU at 50% and 21.8%, respectively. [33,18] One of the largest studies conducted in 138 hospitals in France, Belgium, and Switzerland, including over 4000 patients critically ill with COVID-19 admitted to an ICU, reported that patients who were older or had diabetes or obesity were at the highest risk of mortality.[18]

This study has many limitations: first, we depended on data registered by health care providers who were unaware of the research and its objectives, introducing some unintended bias. The second was that we could not have all the records, except the outcomes, of the patients who were referred to other hospitals for further care. The third was that we could not have all the laboratory results routinely done to the patients with COVID-19. Finally, we conducted the study in a single centre, making our results non-generalisable to the community.

CONCLUSION

Middle aged-elderly male patients admitted with severe or critical conditions are susceptible to complications, worsened in a short period of time and increase the risk of mortality. The onset of illness may help physicians identify the patients with poor prognosis.

REFERENCES

1. Mayo Clinic. [Internet]. Coronavirus disease 2019 (COVID-19). Available from: www.mayoclinic.org/diseases-conditions/coronavirus/symptoms-causes/syc-20479963. Accessed on May 2022.
2. Zhao X, Xu X, Yin H, Hu Q, Xiong T, et al. Clinical characteristics of patients with 2019 coronavirus disease in a non-Wuhan area of Hubei Province, China: a retrospective study. *BMC Infectious Diseases* 2020; 20:311.
3. Kaur N, Gupta I, Singh H, Karia R, Ashraf A, et al. Epidemiological and Clinical Characteristics of 6635 COVID-19 Patients: a Pooled Analysis. SN Compr. *Clin. Med*. 2020;2:1048–1052.
4. Setu Y. Epidemiological and Clinical Characteristics of Corona Virus Disease (Covid-19) Suspected Individuals at Covid Testing Center of Tertiary Care Hospital in New Delhi. *Himalayan Journal of Community Medicine and Public Health* 2021 Sept-Oct;2(5): 52-55.
5. Almomani EY, Qablan AM, Atrooz FY, Almomany AM, Hajjo RM and Almomani HY. The Influence of Coronavirus Diseases 2019 (COVID-19) Pandemic and the Quarantine Practices on University Students' Beliefs about the Online Learning Experience in Jordan. *Front. Public Health* 2021 Jan. https://doi.org/10.3389/fpubh.2020.595874.
6. NIH. Coronavirus Disease 2019 (COVID-19) Treatment Guidelines. Last Updated: 2021 11 February. Available from: www.covid19treatmentguidelines.nih.gov. Accessed on March 2021.
7. McIntosh K, Hirsch M, Bloom A. COVID-19: Epidemiology, virology, and prevention. Up To Date Terms of Use. ©2021 UpToDate.
8. Milovanovic L, Hessey E, Sebastianski M, et al. Epidemiology, clinical characteristics and treatment of critically ill patients with COVID-19): a protocol for a living systematic review. *BMJ Open* 2021;11: e042008. doi:10.1136/ bmjopen-2020-042008.
9. Asghar A, Bamaga M, Khogeer A, Abd El-Rahim I, Mashat B, et al. Epidemiological Features of COVID-19 in Makkah City: A Retrospective Data Analysis. Hindawi Computational and Mathematical Methods in Medicine 2022, Article ID 8301490, 7 pages. https://doi.org/10.1155/2022/8301490
10. Wikipedia. COVID-19 pandemic in Iraq. Available from: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Iraq.
11. Oren O, Kopecky S, Gluckman T , Gersh B, C Blumenthal R. Coronavirus Disease 2019 (COVID-19): Epidemiology, Clinical Spectrum and Implications for the Cardiovascular Clinician. JACC Journals on ACC.org . 2020;4.
12. Management department in Iraqi Ministry Of Health. 2020;9-8.
13. Zhong F, Huang J, Yang X , Peng JL , Zhang Y et al.Epidemiological and clinical characteristics of COVID-19 patients in Hengyang, Hunan Province, China. *World J Clin Cases*. 2020; 8(12):2554-2565.
14. Aminul I, Samina S, Abdullah A, Mohammad S. Sex-specific epidemiological and clinical characteristics of Covid-19 patients in the southeast region of Bangladesh. MedRxiv. doi: https://doi.org/10.1101/2021.07.05.21259933.
15. Ahmad M, Beg BM, Majeed A, Areej S, Riffat S, Rasheed MA, Mahmood S, Mushtaq RMZ and Hafeez MA. Epidemiological and Clinical Characteristics of COVID-19: A Retrospective Multi-Center Study in Pakistan. *Front. Public Health*, 2021;9:644199. doi: 10.3389/fpubh.2021.644199
16. Li Y, Pan A, Wang DD, Liu X, Dhana K, Franco OH, Kaptoge S, Di Angelantonio E, Stampfer M, Willett WC, Hu FB. Impact of Healthy Lifestyle Factors on Life Expectancies in the US Population. *Circulation*. 2018 Jul 24;138(4):345-355. doi: 10.1161/CIRCULATIONAHA.117.032047.
17. Seims A, White A . Lifestyle behaviours of men and women and implications for healthy lifestyle service providers in the large municipality of Leeds, UK. In: 8th Nordic Health Promotion Research Conference, 2016 June, Jyväskylä, Finland. https://www.jyu.fi/sport/laitokset/terveys/en/NHPR.
18. Alhamlan F, Almaghrabi R , Devol E , Alotaibi A , Alageel S, et al. Epidemiology and Clinical Characteristics in Individuals with Confirmed SARS-CoV-2 Infection During the Early COVID-19 Pandemic in Saudi Arabia. medRxiv. preprint doi: https://doi.org/10.1101/2021.07.13.21260428; www.medrxiv.org/content/10.1101/2021.07.13.21260428v1.
19. Wang D, Hu B, Hu C, Zhu F, Liu X et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus–Infected Pneumonia in Wuhan, China. *JAMA* 2020;3(323):11323.
20. Liu K, Fang YY, Deng Y, Liu W, Wang MF, Ma JP, Xiao W, Wang YN, Zhong MH, Li CH, Li GC, Liu HG. Clinical characteristics of novel coronavirus cases in tertiary hospitals in Hubei Province. *Chin Med J (Engl)*. 2020 May 5;133(9):1025-1031. doi: 10.1097/CM9.0000000000000744. PMID: 32044814; PMCID:

PMC7147277.

21. Aggarwal A, Shrivastava A, Kumar A, Ali A. Clinical and Epidemiological Features of SARS-CoV-2 Patients in SARI Ward of a Tertiary Care Centre in New Delhi. *J Assoc Physicians India*. 2020 Jul;68(7):19-26. PMID: 32602676.
22. Guan W, Ni Z, Hu Y, Liang W, Ou C, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med* 2020;382:1708-20. DOI: 10.1056/NEJMoa2002032.
23. Liao J, Fan S, Chen J, Wu J, Xu S, Guo Y, Li C, Zhang X, Wu C, Mou H, Song C. Epidemiological and clinical characteristics of COVID-19 in adolescents and young adults. *The Innovation*. 2020 May 21;1(1):100001.
24. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, Qiu Y, Wang J, Liu Y, Wei Y, Xia J, Yu T, Zhang X, Zhang L. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet*. 2020 Feb 15;395(10223):507-513. doi: 10.1016/S0140-6736(20)30211-7. Epub 2020 Jan 30. PMID: 32007143; PMCID: PMC7135076.
25. Badedi M, Darraj H, Alnami A, Makrami A, Mahfouz M, et al. Epidemiological and Clinical Characteristics of Deceased COVID-19 Patients. *International Journal of General Medicine* 2021:14 3809–3819.
26. Koh J, Shah S, Chua P, Gui H and Pang J. Epidemiological and Clinical Characteristics of Cases During the Early Phase of COVID-19 Pandemic: A Systematic Review and Meta-Analysis. *Frontiers in Medicine*. 2020 June;7(295). www.frontiersin.org
27. Zhou Y, Yang Q, Chi J, Dong B, Lv W, Shen L, Wang Y. Comorbidities and the risk of severe or fatal outcomes associated with coronavirus disease 2019: A systematic review and meta-analysis. *Int J Infect Dis*. 2020 Oct;99:47-56. doi: 10.1016/j.ijid.2020.07.029. Epub 2020 Jul 25. PMID: 32721533; PMCID: PMC7381888.
28. Gold J, Wong K, Szablewski C, Patel P, Rossow J,et al. Characteristics and Clinical Outcomes of Adult Patients Hospitalised with COVID-19 — Georgia, March 2020. *Morbidity and Mortality Weekly Report*, May 8, 2020 / 69(18);545–550.
29. Mekolo D, Bokalli FA, Chi FM, Fonkou SB, Takere MM, Ekukole CM, Balomoth JMB, Nsagha DS, Essomba NE, Njock LR, Ngowe MN. Clinical and epidemiological characteristics and outcomes of patients hospitalized for COVID-19 in Douala, Cameroon. *Pan Afr Med J*. 2021 Mar 8;38:246. doi: 10.11604/pamj.2021.38.246.28169. PMID: 34104294; PMCID: PMC8164425.
30. Shen Y, Zheng F, Sun D, Ling Y, Chen J, Li F, Li T, et al. Epidemiology and clinical course of COVID-19 in Shanghai, China. *Emerg Microbes Infect*. 2020 Dec;9(1):1537-1545. doi: 10.1080/22221751.2020.1787103. PMID: 32573353; PMCID: PMC7473125.
31. Nowak B, Szymański P, Pańkowski I, Szarowska A, Życińska K, Rogowski W, et al. Clinical characteristics and short-term outcomes of patients with coronavirus disease 2019: a retrospective single-center experience of a designated hospital in Poland. *Pol Arch Intern Med*. 2020 May 29;130(5):407-411. doi: 10.20452/pamw.15361. Epub 2020 May 18. PMID: 32420710.
32. Wang W, Tang J, Wei F. Updated understanding of the outbreak of 2019 novel coronavirus (2019-nCoV) in Wuhan, China. *J Med Virol*. 2020;92:441–447. https://doi.org/10.1002/jmv.25689
33. Ramkumar R, Rani D, Bhattacharjee S, Aggarwal R, Soni KD, Aravindan A, et al. Epidemiology and clinical characteristics of COVID-19 patients requiring critical care in a Tertiary care teaching hospital. *J Anaesthesiol Clin Pharmacol* 2021;37:366-70.

Abbreviations list: Acute respiratory distress syndrome (**ARDS**), Angiotensin-converting enzyme 2 (**ACE2**), Continuous positive airway pressure (**CPAP**), Coronavirus Disease 2019 (**COVID-19**), Diabetes Mellitus (**DM**), Intensive care unit (**ICU**), Interquartile range (**IQR**), Middle East respiratory syndrome (**MERS**), Minute (**min**), Partial pressure of Oxygen in arteries/ fractional flow of oxygen (**PaO2/FiO2**), Real-time polymerase chain reaction (**RT-PCR**), Respiratory Care Unite (**RCU**), Respiratory rate (**RR**), Severe acute respiratory syndrome (**SARS**), Severe acute respiratory syndrome coronavirus 2 (**SARS-CoV-2**), Standard Deviation (**SD**), Statistical Package for the Social Sciences (**SPSS**), World Health Organization (**WHO**).

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