Original Article

Home management scheme for patients with severe covid-19 in Duhok city, Kurdistan region of Iraq: a possible role for family physicians

Nawfal R. Hussein¹, Zana Sidiq M. Saleem², Brisik H. Rashad¹, Ibrahim A. Naqid¹, Nashwan Ibrahim², Dildar H. Musa², Nina D. Khezaqia³, Ahmed H. Yousif⁴

¹Department of Biomedical Sciences, College of Medicine, University of Zakho, Kurdistan Region, ²Department of Internal Medicine and Surgery, College of Medicine, University of Duhok, Kurdistan Region, ³Department of Internal Medicine, Azadi Teaching Hospital, Duhok, Kurdistan Region, ⁴Department of Internal Medicine, Zakho General Hospital, Duhok, Kurdistan Region, Iraq

ABSTRACT

Aim: This study investigated the clinical characteristics and outcomes of patients with severe coronavirus disease 2019 (COVID-19) who were involved in the home management scheme in Duhok city. **Materials and Methods:** This prospective descriptive study enrolled Kurdish patients diagnosed with severe COVID-19 between June 1 and November 1, 2020, and were treated at home. **Results:** The average age of the patients was 59.77 ± 14 years and 51 (56.04%) of them were males. Seven of these patients (7.69%) were smokers. Most patients (72.52%) had one or more comorbidities. Fever (87.1%) was the most commonly presented symptom in older patients. The case fatality rate was 3/91 (3.29%). This rate was not found to be associated with sex, history of smoking, or comorbidities. The age of deceased patients (40 ± 25 years) was significantly lower than that of cured patients (60 ± 13 years) ($p = -0.025$). **Conclusions:** The case fatality rate of patients enrolled in this scheme was comparable to those who received treatment in hospitals. Therefore, this scheme could provide a good alternative for treating patients with severe COVID-19 and family physicians could lead the scheme through the primary care network.

Keywords: COVID-19, Duhok, family physician, home management scheme, Kurdistan

Introduction

When coronavirus disease 2019 (COVID-19) spread globally, most countries adopted extraordinary measures to contain its spread and fatality rate.[1-3] Iraqi Kurdistan Region declared a lockdown and drastic steps were taken to combat the spread of infection. Gatherings and religious rituals were canceled and schools, educational institutions, airports, and country borders were closed.[4]

Although these measures successfully controlled the spread of infection,[5] economic turmoil, collective exhaustion, and mounting pressure led to the government relaxing measures without exploring reasonable alternatives. These relaxed containment measures caused a sharp increase in the number of patients, and the case fatality rate doubled.[4]

Address for correspondence: Dr. Ibrahim A. Naqid,
Department of Biomedical Science, College of Medicine,
University of Zakho, Kurdistan Region, Iraq.
E-mail: ibrahim.naqid@uoz.edu.krd

How to cite this article: Hussein NR, Saleem ZSM, Rashad BH, Naqid IA, Ibrahim N, Musa DH, *et al.* Home management scheme for patients with severe COVID-19 in Duhok city, Kurdistan Region of Iraq: A possible role for family physicians. J Family Med Prim Care 2021;10:4260-3.

Family physicians are often the first contact for patients in medical emergencies. However, the role of these physicians during the pandemic was not influential in fighting the infection. Although all healthcare clinics were closed during the pandemic, overall hospitalizations were the highest, and dedicated COVID-19 centers became overwhelmed, following which the patients who may have benefitted from inpatient care were discharged from the emergency department. Therefore, a home management scheme was launched to treat and follow-up patients with COVID-19. This study investigated the clinical characteristics and outcomes of these patients.

Materials and Methods

Setting and study design

Three hospitals in Duhok City were allocated for the treatment of patients with COVID-19. The hospitals have a capacity of about 300 beds. Patients diagnosed with severe COVID-19 were treated at these centers and those having mild to moderate symptoms were treated at home. This prospective descriptive study enrolled Kurdish patients with severe COVID-19 who were diagnosed between June 1 and November 1, 2020, and treated at home.

Definitions

Any individual having a positive severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) polymerase chain reaction (PCR) test result regardless of the presence of symptoms was considered a patient. Duplicate PCR tests were also conducted. Patients were then classified as mild, moderate, severe, or critically ill. Mild cases of patients were asymptomatic

Table 1: Characteristics of participants with severe COVID-19

	Frequency	Percentage
Sex (male)	51	56
Smoking	7	7.7
Comorbidities	66	72.5
Symptoms		
Fever	81	87.1
Myalgia	38	40.9
Dry cough	35	37.63
Loss of appetite	24	25.8
Loss of taste	16	17.2
Shortness of breath	14	15.1
Fatigue	10	10.8
Age (mean±STD)	59.77±14	
Duration of symptoms (mean±STD)	7.8±4.32	

or presented radiological evidence of pneumonia. Moderate cases of patients showed radiological evidence of pneumonia as well as respiratory symptoms, but with normal respiratory rate and saturation of peripheral oxygen (SPO$_2$). Severe cases presented with radiological evidence of pneumonia including symptoms such as respiratory distress, oxygen saturation level of ≤93% at room air. Patients who needed intensive care unit admission or mechanical ventilation were excluded from the study.

Patients were considered cured if they were afebrile for >3 days, had improved respiratory symptoms, and had negative nucleic acid tests for respiratory tract pathogens twice consecutively (sampling interval ≥24 hours). The case fatality rate was calculated as the proportion of participants who succumbed to the disease among all participants diagnosed with COVID-19.

Treatment

The diagnoses, assessments, and management criteria for COVID-19 were in accordance with the guidelines published by the Ministry of Health of the Republic of Iraq. Since March 2020, healthcare policymakers have published and updated mandatory guidelines to diagnose and manage COVID-19 patients. The treatment included a 1600 mg dose of favipiravir twice a day on the first day followed by a 600 mg dose twice a day, daily. A 6 mg oral dose of dexamethasone was followed by weight-based administration of enoxaparin.

Home management scheme

Patients were enrolled in this scheme when hospital beds were unavailable or when they were refused admission. A family member was trained to measure vital signs, use a pulse oximeter, administer a subcutaneous injection, and provide oxygen therapy to the patient. The care provider was given 24/24 access to contact health care professionals in case of emergencies. All patients were provided with oxygen bottles and other necessary equipment.

Statistics

Linear regression was used to study the relationship between continuous variables as well as outcomes and Fisher's exact test measured the categorical data. *P* values of <0.05 were considered significant.

Ethics

The study protocol was approved by the Ethics and Research Committee of the College of Medicine, University of Zakho,

Table 2: Factors impacting the clinical outcomes

Factors	Cured	Died	CI	OR	*P*
Sex male No (%)	48 (53.33%)	3 (100%)	0.046-4.581	0.45	0.48
Smoking No (%)	7 (7.77%)	0 (0%)	0.04-4.054	0.41	0.47
Comorbidities No (%)	63 (70%)	3 (100%)	0.085-7.746	0.815	0.85
Age (mean±STD)	60±13	40±25	1.007-1.168	1.1	0.025
Duration of symptoms (mean±STD)	7.91±4.31	4.66±3.78	0.870-1.880	1.3	0.153

Results

Patient characteristics

SARS-CoV-2 RTPCR test confirmed that 93 patients and severe COVID-19 and required hospitalization during the study period. The measurement of patient outcomes was completed on January 02, 2021. The average age of the patients was 59.77 ± 14 years, and 51 (56.04%) of them were men [Table 1]. Among the patients, 7 (7.69%) were smokers. A vast majority of these patients (72.52%) had one or more chronic comorbidities [Table 1]. The four most commonly presented symptoms in the older patients were fever (87.1%), myalgia (40.9%), dry cough (37.63%), and fever (63.5%). The average duration from the appearance of symptoms to the initiation of treatment was 7.81 ± 4.31 days. Recent travel history was not found.

Outcomes and risk factors

During the study period, 93 patients were enrolled in the home management scheme due to the unavailability of vacant hospital beds or refusal of admission. Among those patients, the case fatality rate was 3/91 (3.29%). The risk factors associated with the case fatality rate were studied in the scheme [Table 2]. The case fatality rate was not found to be associated with sex, history of smoking, and comorbidities. The age of deceased patients (40 ± 25 years) was significantly lower than that of cured patients (60 ± 13 years) (p = -0.025). Duration of the symptoms before the initial treatment was not associated with the patient outcomes.

Discussion

While family physician centers were closed in the region during the COVID-19 pandemic, the hospital experienced a surge of patients from June 2020. Major hospitals in the city canceled elective and scheduled surgeries and facilities were provided to receive patients. The rising number of hospitalized patients pushed the health system to breaking point and a crisis triage level was imposed to discourage patients having mild to moderate symptoms from coming to the hospitals. This level failed to treat all the patients. Therefore, a pilot home management scheme was established to treat the patients who refused or could not get admitted to the hospitals. This project investigated the clinical characteristics and outcomes of patients diagnosed with severe COVID-19 who were enrolled in the home management scheme. This report discusses the data on patients of different age groups who were treated at home through telemedicine supervision and not by healthcare personnel.

In agreement with studies conducted elsewhere,[6-9] the most commonly presented clinical symptoms were fever, myalgia, and dry cough. Dyspnea was also commonly observed. The case fatality rate of 3.29% was equivalent to the previously reported rate in Iraq and elsewhere.[4,6-8,10] Thus, it is evident from these results that healthcare at home is becoming important and may help solve issues such as the shortage of hospital beds and healthcare workers. Home care can be made easier and safer for such patients by following good hygiene practices and using pulse oximetry, oxygen therapy, and telemedicine. This home management scheme could provide a good alternative for carrying out home-based treatment for patients with severe COVID-19 in low-income countries. Family physicians should be involved in such schemes to help decrease the pressure on pulmonology units. Family physicians must have response guidelines to start planning the COVID-19 mitigation process.[11] COVID-19 will remain an important infection for decades. Therefore, improving diagnostic testing as well as its management and prevention has become a major collective goal of the biomedical community. The family physicians should contribute towards this improvement. They can lead home management schemes through the primary care network. Additionally, this scheme would change the shape of treatment from the traditional hospital-centered concept.

Factors that may impact clinical outcomes were studied. No association was found between the current smoking status and increased risk of adverse prognoses when a meta-analysis was conducted on 1,399 COVID-19 patients in China.[12] In contrast, in another study, subjects with a history of smoking were found vulnerable to severe COVID-19.[13] Therefore, preventative measures are important to reduce morbidity and mortality in smokers. In addition, studies from China showed that older age was associated with a higher mortality rate.[14,15] However, in agreement with a study from the USA,[16] our study showed that the age of the patients who succumbed to the infection was younger than those who survived it. Although the sample size was small, in our study, the severity of comorbidities explained the death of younger patients. In agreement with the results of the other studies, time from first symptoms to the initial treatment did not influence the clinical outcome.[8]

The study has some limitations. All the patients could not be included due to the lack of collaboration among the management centers. Controlling the spread of the infection within the family was an issue for the scheme as the follow-up of all the members for the new infections was not possible. However, hospitalization was not required for any member of these families.

To conclude, the case fatality rate of patients who were recruited in the home management scheme was comparable to those who received treatment in the hospitals. Thus, this study implies that patients with severe COVID-19 can be successfully treated at home. As pressure on hospitals, especially pulmonology units, is increasing, family physicians could play a pivotal role in the treatment and follow-up of patients with severe COVID-19. With the assistance of family physicians, the home-based management scheme could become the cornerstone of management in patients with COVID-19.

And Kurdistan Region of Iraq, and followed the ethical principles of the Declaration of Helsinki. Informed consent was obtained from all participants.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflicts of interest

There are no conflicts of interest.

References

1. Kraemer MUG, Yang CH, Gutierrez B, Wu CH, Klein B, Pigott DM, *et al.* The effect of human mobility and control measures on the COVID-19 epidemic in China. Science 2020;368:493-7.

2. Xiao Y, Torok ME. Taking the right measures to control COVID-19. Lancet Infect Dis 2020;20:523-4.

3. Velavan TP, Meyer CG. The COVID-19 epidemic. Trop Med Int Health 2020;25:278-80.

4. Hussein NR, Naqid IA, Saleem ZSM, Almizori LA, Musa DH, Ibrahim N. A sharp increase in the number of COVID-19 cases and case fatality rates after lifting the lockdown in Kurdistan region of Iraq. Ann Med Surg (Lond) 2020;57:140-2.

5. Hussein NR, Naqid IA, Saleem ZSM. A retrospective descriptive study characterizing coronavirus disease epidemiology among people in the Kurdistan Region, Iraq.

6. Ashraf MA, Shokouhi N, Shirali E, Davari-tanha F, Memar O, Kamalipour A, *et al.* COVID-19 in Iran, a comprehensive investigation from exposure to treatment outcomes. medRxiv. 2020. doi: 10.1101/2020.04.20.20072421.

7. Esme M, Koca M, Dikmeer A, Balci C, Ata N, Dogu BB, *et al.* Older adults with coronavirus disease 2019; A nationwide study in Turkey. J Gerontol A Biol Sci Med Sci 2021;76:e68-75.

8. Medetalibeyoglu A, Senkal N, Kose M, Catma Y, Bilge Caparali E, Erelel M, *et al.* Older adults hospitalized with Covid-19: Clinical characteristics and early outcomes from a single center in Istanbul, Turkey. J Nutr Health Aging 2020;24:928-37.

9. Singla N, Gowda R, Mohindra R, Suri V, Dhibar DP, Sharma N. Clinical spectrum and outcome of patients visiting coronavirus screening centre in North India and clinical predictors for COVID-19. J Family Med Prim Care 2021;10:454-61.

10. Hussein NR, M Saleem ZS, Ibrahim N, Musa DH, Naqid IA. The impact of COVID-19 pandemic on the care of patients with kidney diseases in Duhok City, Kurdistan Region of Iraq. Diabetes Metab Syndr 2020;14:1551-3.

11. Raina SK, Kumar R, Kumar A, Kumar D, Raina S, Gupta R, *et al.* Broad guidelines for primary care practitioners/ standalone private health facilities/frontline healthcare facilities in view of COVID-19 pandemic. J Family Med Prim Care 2021;10:1-9.

12. Lippi G, Henry BM. Active smoking is not associated with severity of coronavirus disease 2019 (COVID-19). Eur J Intern Med 2020;75:107-8.

13. Reddy RK, Charles WN, Sklavounos A, Dutt A, Seed PT, Khajuria A. The effect of smoking on COVID-19 severity: A systematic review and meta-analysis. J Med Virol 2021;93:1045-56.

14. Li J, Huang DQ, Zou B, Yang H, Hui WZ, Rui F, *et al.* Epidemiology of COVID-19: A systematic review and meta-analysis of clinical characteristics, risk factors, and outcomes. J Med Virol 2021;93:1449-58.

15. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72 314 cases from the Chinese center for disease control and prevention. JAMA 2020;323:1239-42.

16. Hendren NS, de Lemos JA, Ayers C, Das SR, Rao A, Carter S, *et al.* Association of body mass index and age with morbidity and mortality in patients hospitalized with COVID-19. Circulation 2021;143:135-44.