

Persistent symptoms in an Iraq patient sample after infection with COVID -19

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Keywords:

COVID -19; SARS-Cov2;
coronavirus; long-term effects
and persistent symptoms

ABSTRACT

In Iraq, a large proportion of coronavirus 2019 (COVID-19) patients were 1,340,000 confirmed cases as of June 7, 2021. The common symptoms of acute patients include cough, fever, shortness of breath and myalgia, joint pain, fatigue, gastrointestinal symptoms, and dyspepsia. Because there are only limited data and evidence available about the long-term effects in patients after recovery from infection with COVID-19, the aim of this study is to evaluate and determine the persistent symptoms in Iraqi patients after recovery from COVID-19. Hence, particular data on specific symptoms and infections associated with COVID-19 were obtained using a common standard questionnaire run by the researchers where the subjects (754) are asked to complete a form prepared for this purpose that indicated the absence or presence of symptoms. The results of these unique studies in Iraq showed that about 85.5% of people who recover from COVID-19 have at least one persistent symptom. The most common symptoms were joint pain, dyspnoea, chest pain, and cough. The results also showed other symptoms, though at lower incidence than the above, such as headache, heart palpitations, and hearing disorders had been noted. With respect to less common symptoms and those also considered important long-term complications, 191 (19.2%) of respondents had neurological problems, 163 (16.3%) had psychological problems, and 154 (15.4%) had skin rash and hair loss, where the durations of these persistent symptoms lasted from 1-6 months. In conclusion, the present study has shown that different persistent symptoms were common in recovered COVID-19 patients and were related to age and number of comorbidities present during the acute phase. Many COVID-19 patients were back to their normal physical health in one month however the majority of patients were symptoms-free from 1-6 months after COVID-19 onset.



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1. INTRODUCTION

On December 31, 2019, a group of cases of idiopathic pneumonia appeared in China. People associated with the Huanan Seafood Wholesale Market in Wuhan were reported to have these symptoms. Only a few days later, the Chinese health authorities confirmed that the cause of this pneumonia was linked to a new

coronavirus [1]. The World Health Organization (WHO) terms the new coronaviruses COVID-19 (Coronavirus Disease 2019) [2]. The WHO stated that during the ensuing global pandemic, Iraq was considered one of the most affected Arab countries by this pandemic in terms of the proportions of infections and deaths [3]. The symptoms and severity of COVID-19 ranged from being asymptomatic to symptoms that varied in severity from moderate to severe, with up to 15% of patients requiring of hospitalization. [4]. A study conducted in China indicated that about 81% of people infected with the Covid-19 virus suffered from moderate infection. Further, about 14% of those infected had severe symptoms as represented by respiratory dysfunction, with 5% of those infected having serious diseases characterized by respiratory failure and septic shock, plus multiple organ failure [5]. Disease symptoms varied and from person to person according to age, which included fever, cough, sore throat, runny nose, headache, and difficulty breathing [6], [7]. These Symptoms may take up to 14 days to clear after exposure to COVID-19 [8], but COVID-19 survivors have moderate or long-term problems after discharge from hospital, and which are known abnormal clinical signs that persist for three weeks after onset with COVID-19. Hence, these clinical signs are described as persistent infections or are sometimes referred to as long-term effects of disease [9]. Hence, the aim of this study is to determine the long-term clinical complications present in Iraqi samples and the duration of these clinical signs.

1.1 Study design

Data on specific symptoms and infections associated with COVID-19 were obtained using common standard questionnaire run by the researchers (from 1st April to 30th June, 2021) where patients were asked to fill out a form which was prepared for this purpose indicating the absence and/or presence of symptoms with an indications of the nature of these symptoms with high accuracy during the period of infection with COVID-19, the patient's recovery time, as well as the nature of symptoms that persisted after recovery from the virus. Statistical analysis was conducted by comparing the descriptive variables of the respondents, using the SPSS test and the results were expressed as percentages.

1.2 Ethical approval

Ethical approval was obtained from the University Of Baghdad/ College Of Science for Women.

2. Results

The first case of COVID-19 in Iraq was reported on February 24 in the city of Najaf, linked to someone who had recently returned from Iran [10], after which the number of cases in the country increased to exceed one million cases in only one year. From 1 April to 30 June 2021, Iraqi volunteers (who had recovered from infection by COVID-19), in the form of a cohort of 754 subjects (100 males and 654 females), participated in post-infection COVID-19 assessments. Data were collected from subjects after recovering from COVID-19 by filling in questionnaires, which were then analysed. The results of the study are summarized in Tables 1 and 2. In total, 754 people participated in the questionnaire. The mean age of the participants was 28.708 ± 12.248 years, and the largest age group was the 20–39 years (66%). The majority of participants were female (86.74%) with an average weight of 65.890 ± 13.902 kg, compared to males (13.26%) with an average weight of 82.860 ± 21.670 kg, and where a significant majority of participants were from Baghdad (89.8%). The blood group O+ represented the largest percentage (28.5%) amongst the cohort subjects, while the AB- group represented the smallest (0.8%). About 19.2% of participants did not know their blood group. With respect to the month of infection, the incidence was found higher in June (16.7%) and the common method of confirmation of infection was through a nasopharyngeal swab (41.3%). 46.3% of participants suffered from chronic diseases, with most of them are suffering from allergies (12.8%), while 53.7% of participants did not have chronic diseases. More than four hundred participants were treated with different types of therapies and more than three hundred participants

depended only on food supplements without further clarification. Overall, 48% of respondents suffered from vitamin D deficiency, whilst 14.3% suffered from tumours, and only a tiny number of infected individuals (0.4%) affected tumour progression. A small number (105) of participants were pregnant females; the majority (73.3%) saw no effect on mother and foetus, while a small percentage (6.7%) suffered miscarriage.

The current study evaluated acute and long-term symptoms and their duration after infection. The evaluation showed that only 55 (1.9%) were completely free of any COVID-19-related symptoms, while 699 (98.1%) of the subjects had signs or symptoms of acute illness. Fever (20.1%) represented the most common acute symptom followed by loss of sense of taste or smell (17.5%), myalgia (13%), cough (12%), and sore throat (10%), with a small percentage suffering from diarrhoea, runny nose, sputum, phantasmia, and vomiting. Two weeks represented the longest period of acute symptoms (49.9%) for the participants, whilst the shortest period was 3-5 days (10.2%). When evaluating the most common long-term symptoms and their duration, these apparently started three weeks after infection and confirmation of having COVID-19. 14.5% of the sample reported being symptom-free, while 20.6% reported joint pain, 17.8% dyspnoea, and 15.1% chest pain and coughing. A high proportion of individuals reported long-term symptoms such as headache (22.6%), heart palpitations (14%), myalgia, (13.2%) and a small percentage hearing disorders (4.1%). With respect to less common symptoms that were also considered significant long-term complications, 191 (19.2%) respondents had neurological problems, 163 (16.3%) had psychological problems, 154 (15.4%) had a skin disorders such as rash and hair loss, and 366 (36.7%) had no long-term complications. According to this study, the respondents reported the length of their long-term symptoms as being from three weeks (27.2%), to one month (24.1%), and 2-3 months (19.4%).

Table (1): The demographic and clinical characteristics of the survey cohort (N = 754) as related to post-infection by COVID -19, as obtained from completed questionnaire forms

Characteristics	Total	Gender	
		Female	Male
Gender, No. (%)	754	654 (86.74)	100 (13.26)
Age, mean ± SD (years)	28.708±12.248	26.630±10.235	42.300±15.392
Age groups (years), No. (%)			
10-19 y	101 (13.4)	93 (14.2)	8 (8)
20-39y	498 (66)	464 (70.9)	34 (34)
40- 59y	133 (17.6)	91 (13.9)	42 (42)
≥60	22 (2.9)	6 (0.9)	16 (16)
Place of residence during the infection No. (%)			
Baghdad	677 (89.8)	593 (90.7)	84 (84)
Outside Baghdad	77 (10.2)	61 (9.3)	16 (16)
Weight mean ± SD (kilograms)	68.061 ± 16.226	65.890 ± 13.902	82.860 ± 21.670
Weight in kilograms No. (%)			
30-59	222 (29.1)	229 (32)	9 (9)
60-79	376 (49.8)	343 (52.4)	33 (33)
80-99	128 (16.9)	86 (13.1)	42 (42)
>100	32 (4.2)	16 (2.4)	16 (16)

Blood groups No. (%)			
A+	151 (20)	113 (17.3)	38 (38)
A-	24 (3.2)	20 (3.1)	4 (4)
B+	130 (17.2)	110 (16.8)	20 (20)
B-	14 (1.8)	14 (2.1)	0
O+	215 (28.5)	186 (28.4)	29 (29)
O-	12 (1.6)	12 (1.8)	0
AB+	57 (7.6)	53 (8.1)	4 (4)
AB-	6 (0.8)	6 (0.9)	0
Not known by subject	145 (19.2)	140 (21.4)	5 (5)
The month of infection No. (%)			
January	46 (6.1)	44 (6.7)	2 (2)
February	59 (7.8)	46 (7)	13 (13)
March	66 (8.7)	53 (8.1)	13 (13)
April	80 (10.6)	66 (10.1)	14 (14)
May	70 (9.3)	64 (9.8)	6 (6)
June	126 (16.7)	112 (17.1)	14 (14)
July	62 (8.2)	62 (9.5)	0
August	57 (7.6)	42 (6.4)	15 (15)
September	55 (7.3)	45 (6.9)	10 (10)
October	67 (8.9)	58 (8.9)	9 (9)
November	32 (4.2)	32 (4.9)	0
December	34 (4.5)	30 (4.6)	4 (4)
Table 1: continued			
*Diagnosis No. (%)			
Nasopharyngeal swab	368 (41.3)	314 (43.3)	44 (32.7)
Rapid Test	72 (8.1)	67 (9.2)	4 (3)
Haematology and biomarker tests	221 (22.6)	162 (22.3)	39 (23.6)
Computed tomography scan	112 (12.3)	76 (10.5)	34 (20.6)
Only by doctor's diagnosis	142 (15.7)	127 (14.7)	33 (20)
*Chronic diseases No. (%)			
Diabetic	26 (3)	16 (22)	12 (7.8)
arthritis	44 (5.1)	37 (5)	7 (5.5)
Obesity	34 (3.9)	24 (3.2)	12 (7.8)
asthma	29 (3.3)	25 (3.4)	4 (3.1)
Allergy	111 (12.8)	104 (14)	7 (5.5)
Heart disease	21 (2.4)	15 (2)	6 (4.7)
Hypertension	62 (6.9)	40 (5.4)	22 (15.6)
Thyroid disorders	45 (5.2)	45 (6)	2
Kidney disease	32 (3.7)	26 (3.5)	6 (4.7)
Subjects without chronic diseases	467 (53.7)	412 (55.4)	48 (45.3)
Suffering vitamin D deficiency No. (%)			
Yes	362 (48)	328 (50.2)	34 (34)
No	148 (19.6)	128 (16.5)	42 (40)
They don't know	244 (32.4)	218 (33.3)	26 (26)
Pharmacological treatments No. (%)			
Yes	453 (60.1)	382 (58.4)	71 (71)
No	301 (39.9)	272 (41.6)	29 (29)
Type of treatment No. (%)			
Antibiotics and painkillers	422 (53.3)	342 (52)	62 (62)
Food supplements	342 (46.7)	314 (48)	38 (38)

Tumours No. (%)			
Exacerbate the progression of the disease	3 (0.4)	3 (0.5)	0
Urging the emergence of disease after recovery	0	0 (0.3)	0
Urge the emergence of a benign disease	0	0	0
Did not effect	105 (13.9)	97 (14.8)	8 (8)
Subjects without tumours	646 (85.7)	554 (84.7)	92 (92)
** Infection of a pregnant woman will lead to, No. (%)			
Abortion		7 (6.7)	
Foetal death during childbirth		0	
Abnormalities of the foetus		0	
Affected the mother and did not affect the foetus		21 (20)	
There are no effects		77 (73.3)	

*The question is multiple choice, therefore the numbers are different from the number of survey participants.

**the question concerns infected pregnant women only, therefore the numbers do not represent the entire sample.

Table (2): The data from the survey cohort (N = 754) related to acute, post-acute, and persistent COVID-19 symptoms as obtained from completed questionnaire forms

Characteristics	Total (N = 754)	Gender	
		Female	Male
*Acute COVID-19 symptoms, No.)%(
Asymptomatic	44 (1.9)	43 (2.2)	2 (0.5)
Fever	474 (20.1)	486 (19.8)	89 (22.4)
Runny nose	148 (5.5)	141 (5.7)	17 (4.3)
Sore throat	284 (9.9)	242 (9.8)	42 (10.6)
Cough	342 (12)	284 (11.5)	48 (14.6)
Vomiting	116 (4.1)	124 (4.3)	11 (2.8)
Diarrhoea	173 (6.1)	142 (6.1)	23 (5.8)
Myalgia	372 (13)	312 (12.7)	48 (14.6)
Loss of sense of taste or smell	422 (17.5)	447 (18.2)	43 (13.3)
Phantosmia	134 (4.7)	113 (4.6)	21 (5.3)
Sputum	150 (5.3)	126 (5.1)	24 (6)
Duration of acute symptoms, No. (%)			
3-5 days	17 (2.3)	15 (2.3)	2 (2)
One week	178 (23.6)	161 (24.6)	17 (17)
Two weeks	313 (41.5)	266 (40.7)	47 (47)
Three weeks	191 (25.3)	159 (24.3)	32 (32)
Asymptomatic Patients	55 (7.3)	53 (8.1)	2 (2)
*The most common long-term symptoms, No. (%)			
Hypoxemia	73 (5.3)	61 (5.1)	12 (6.4)
Fatigue	148 (11.5)	124 (10.5)	33 (17.6)
Dyspnoea	244 (17.8)	218 (18.4)	27 (14.4)
Cough	228 (15.1)	178 (15)	32 (16)
Joint pain	283 (20.6)	243 (21.4)	32 (16)
Chest pain	227 (15.1)	181 (15.3)	26 (13.6)
Subjects without long-term symptoms	199 (14.5)	169 (14.3)	30 (16)

*Other reported long-term symptoms, No. (%)			
Difficulty concentrating	181 (11.5)	162 (11.7)	19 (10.4)
Depression	179 (11.4)	162 (11.7)	17 (9.3)
Myalgia	227 (13.2)	183 (13.2)	24 (13.2)
Headache	344 (22.6)	312 (22.5)	43 (23.6)
Intermittent fever	172 (11)	162 (11.5)	12 (6.6)
Rapid heartbeat or palpitations	222 (14)	197 (14.2)	23 (12.6)
Hearing disorders	64 (4.1)	42 (3.6)	14 (7.7)
Subjects without the above symptoms	190 (12.1)	160 (11.5)	30 (16.5)
*The long-term complication and less common has been reported, No. (%)			
Cardiovascular: myocarditis	31 (3.1)	23 (2.6)	8 (6.3)
Respiratory disorder: lung function abnormalities	63 (6.3)	42 (6)	11 (8.7)
Kidney disorder: acute kidney injury	24 (2.5)	24 (2.9)	2
Skin disorder: skin rash, hair loss	144 (15.4)	144 (16.7)	9 (7.1)
Neurological problems Nervous system: problems with the senses, sleep, concentration, and memory	191 (19.2)	162 (18.6)	29 (22.8)
Psychological problems: depression, anxiety, mood changes.	163 (16.3)	147 (16.9)	16 (12.6)
Reproductive problems male infertility, sex hormone disorder	4 (0.4)	4 (0.5)	2
Subjects without the above symptoms	366 (36.7)	312 (35.9)	54 (42.5)
Table 2: continued			
Duration of long-term effects, No. (%)			
Three weeks	205 (27.2)	174 (26.8)	32 (32)
One Month	182 (24.1)	161 (24.6)	21 (21)
2-3 months	146 (19.4)	129 (19.7)	17 (17)
3-4 months	69 (9.2)	64 (9.8)	4 (5)
5-6 Months	28 (3.7)	14 (2.1)	14 (14)
> 6 months	62 (8)	44 (8.3)	6 (6)
Subjects without long-term symptoms	64 (8.5)	57 (8.7)	7 (7)

*The question is multiple choice, therefore the numbers are different from the number of survey participants.

3. Discussion

Researchers are still shedding light on the effects of COVID-19 despite more than a year having passed since the outbreak of the pandemic. However, there has been more interest recently in the impact of COVID-19 on patients with persistent symptoms after their acute illness [11], [12]. Currently, there is no way for long-term COVID-19 diagnosis process because the symptoms are highly variable, extensive, and associated with varying degrees of autonomic dysfunction [13], [14]. The results of these unique studies in Iraq showed about 85.5% of people who recover from COVID-19 have at least one persistent symptom depending on their frequency or rarity, but the most common long-term symptoms in many recovering from COVID-19 include muscular and joint pain, dyspnoea, cough, fatigue, and hypoxemia. As for the less-persistent symptoms, most of those recovering was suffering from headaches, increased heart rate, difficulty concentrating, psychological states, high temperatures, and hearing impairment. As for the persistent symptoms, which were characterized by the rarely being present, these ranged from neurological problems such as difficulty sleeping, concentration and memory issues, psychological problems related to mood changes, depression, anxiety, and skin problems, including rashes and hair loss and, in a very small percentage, problems related to lung function and myocarditis; further, 0.4% of women suffered from changes in sex hormones. There were no cases recorded where there was a change in fertility amongst the males, though this may be due to the fact that the number of male volunteers was significantly smaller than

the females; another reason could be that males would not take fertility tests unless they absolutely needed to. These results are in agreement with other studies such as that by [14] who found abnormalities in lung function, psychological impairment, and reduced exercise capacity were common in SARS and MERS survivors. Other studies found that most patients recovering from COVID -19 had persistent symptoms, particularly fatigue and dyspnoea [16]. Clinical measures with only a minority having abnormal neurological and psychological problems in Italy have shown that the COVID-19 outbreak has had a psychological effect on the people [17]. Also, persistent chest pain after resolution of COVID-19 was recorded in [18], while in the United Kingdom the most common symptoms recorded after COVID-19 included breathlessness and psychological distress [19].

Pregnant women suffer from physiological changes during pregnancy, such as decreased residual functional volumes, elevation of the diaphragm, oedema of the respiratory mucosa, as well as changes in cell immunity, all of which can increase susceptibility to viral infection and can lead to worse outcomes associated with infection by COVID- which may increase the risk of infection Maternal venous thromboembolism [20], [22]. In this research, the results indicated that most pregnant women experience only mild symptoms without effect on the foetus, with only seven cases of COVID-19 leading to miscarriage; it is not clear whether the premature delivery was related to infection with COVID-19. Indeed, because COVID-19 has only recently arisen, there is very little associated information recorded for pregnant women, foetuses, and neonatal children. However, whether preterm delivery is due to iatrogenic or other causes, it needs further investigation to gain a definitive answer [23], and there is only one study to date that has reported COVID-19 infection in a neonate, which was 36 hours after birth [24]. The results indicated that the COVID-19 pandemic has had a negative influence on patients with cancer, where in about 0.4% of cases the progression of the disease has been exacerbated, and may be the reason for that the patient has no desire to visits the medical centre's due to the spread of COVID - 19. Confirmed that many cancer healthcare centres in Iraq have been affected by the COVID-19 pandemic, and this has negatively affected many cancer patients [24]. The study showed that symptoms persisted for at least three weeks in the majority of patients after acute infection, which means that patients with COVID-19 need around five weeks to fully recover, while other patients need 2-6 months to regain their previous, normal healthy state. This is in agreement with a study that assessed the symptoms and their determinants 1.5–6 months after symptom onset in non-hospitalised subjects with COVID-19 [26], while [27] found that the persistence of symptoms continued for around 8–12 weeks in the majority of patients, even amongst those admitted with mild symptoms. Resolving disease-specific symptoms and restoring pre-disease physical health requires follow-up, the time for which ranged from 15 to 110 days post-viral infection [28].

The reasons for the long-term effects of COVID-19 are still unknown, but we can explain them according to a number of factors related to the host themselves, which include age, the presence of chronic diseases such as diabetes and stress, and the ability of the immune system to stimulate cells and produce anti-inflammatory factors. Also, ref. [29] suggest that the symptoms associated with hyperinflammation may be caused by the activation of mast cells by SARS-CoV-2.

4. Conclusions

This study has shown that various kinds of persistent symptoms were common in patients after COVID-19 infection, which was considered to be related to the age and number of comorbidities present during the acute phase. Resolving persistent symptoms and restoring normal physical health requires more than one month for many patients, but the majority of patients were symptom-free 1-6 months after the onset of COVID-19. The rehabilitation of COVID-19 survivors needs the care of a specialist in order to meet the needs of such individuals.

5. Acknowledgments

We are grateful to all the volunteers who contributed by answering our questionnaire in the form of the staff and students at the College of Science for Woman, University of Baghdad, who were recovering from COVID-19.

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