

SHORT REPORT

Geriatrics

Long COVID and chronic fatigue syndrome: A survey of elderly female survivors in Egypt

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Abstract

Objectives: This study aimed to investigate post-COVID-19 symptoms amongst elderly females and whether they could be a risk factor for developing chronic fatigue syndrome (CFS) later on.

Methods: This was a retrospective cross-sectional study, in the form of an online survey. A total of 115 responses were finally included.

Results: The mean age was 73.18 ± 6.42 . Eighty-nine reported symptoms in the post-recovery period; of these 54 had no symptoms of CFS, 60 were possible, and only 1 was probable. Fatigue was reported by 66, musculoskeletal symptoms by 56, and sleep problems by 73. Twenty-nine patients visited a doctor's office as a result. Post-recovery symptoms were significantly related to stress, sadness and sleep disturbances. Also, stress, sadness, sleep disturbances, fatigue, cognitive impairment, and recurrent falls were all significantly associated with CFS-like symptoms.

Conclusions: From our findings, the presence of fatigue, cognitive impairment, stress, sadness, sleep disturbances and recurrent falls in the post-recovery period were all significantly associated with CFS-like symptoms. To conclude it would be reasonable to screen for long COVID and consider the potential for developing CFS later on. Whether it can be a risk factor for developing CFS-like other viral infections will need more larger scale studies to confirm this.

1 | INTRODUCTION

Over the last few months, the after-effects of COVID-19 are becoming more apparent. Terms such as “long COVID,” “post COVID syndrome” and “chronic COVID syndrome,” are gaining scientific attention. They refer to the persistence of COVID-19 symptoms in survivors, it's long-lasting effects, or developing mental health problems.¹ The UK COVID symptom study reported that 10% of COVID +ve patients were still unwell after more than 3 weeks, with symptoms reported including; fatigue, headaches, coughing, sore throat, chest pain and confusion.² Oddly the severity of the infection did not determine the incidence of developing post-COVID symptoms.

The similarity of these symptoms with chronic fatigue syndrome (CFS), which is characterised by fatigue, non-restorative sleep and cognitive problems³ is striking, bearing in mind that post-viral

infection is a recognised risk factor.⁴ An important opinion article in *Frontiers of Medicine* has also posed this question; can COVID-19 cause CFS?⁵ There is increasing concern that COVID-19 may significantly add to the numbers of unrecognised CFS.⁶ In recent literature, there is a leaning towards early recognition of CFS symptoms in those recovering from COVID. Perrin et al justify early identification and treatment of post-viral fatigue to help prevent adding to the existing burden of CFS on health services. They also highlighted that this should be a priority for research.⁷

In older adults chronic fatigue is a significant problem that can negatively impact their health and quality of life,⁸ and CFS tends to be more predominant among women.⁹ Additionally, elderly patients are also more vulnerable to COVID infection and its complications particularly those with existing comorbidities.¹⁰ The aim of this work was to study the presence of post-COVID symptoms amongst

elderly Egyptian females recovering from COVID-19 and to explore the relationship with CFS which could be a potential long-lasting complication.

2 | MATERIALS AND METHODS

We performed a retrospective cross-sectional study, in the form of an online survey targeting females over the age of sixty, conducted from mid-September till mid-October 2020. The questionnaire was distributed online via social media platforms. Research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki, and all participants gave informed consent.

Inclusion criteria included being over the age of 60, being female with a history of COVID-19 infection confirmed by PCR, and at least 1 month must have passed since testing negative for COVID-19. Cases unconfirmed by PCR were excluded, as well as those with a history of pre-existing depression, CFS, or fibromyalgia, as well as incomplete responses.

Sample size was calculated using PASS program version 15, setting the type-1 error (α) at 0.05 and the confidence interval width at 0.06 (margin of error 7.5%). Results from a previous study¹¹ showed that the prevalence of chronic idiopathic fatigue among survived COVID cases was 10%. Calculation according to these values produced a minimal sample size of 97 cases. A total of 121 ladies responded but 6 of these were excluded and 115 were finally included.

The questionnaire (see Appendix) was available in both Arabic and English and covered the following: Recovery duration, time till complete resolution of symptoms, presence of post-recovery symptoms in general, specific symptoms (neurological, sleep, nasopharyngeal, gastro-intestinal, chest, cardiac, musculo-skeletal and nephrological), whether they had visited a doctor recently as a result.

In view of the importance of recognising as soon as possible any likelihood of developing CFS symptoms, we collected the sample early in the pandemic. Our aim was to suggest the possibility or probability of developing CFS in the future. Accordingly, responders were then grouped according to their symptoms as those who had clinical symptoms of CFS but 4 months had not elapsed (possible), those with symptoms and 4 months had passed (probable) and finally those who had none of these.

Statistical analyses were performed using SPSS 25.0 program. Mean, standard deviation (\pm SD) and range were used for parametric numerical data, while Median and Interquartile range (IQR) for non-parametric numerical data. Fisher's exact test was used to examine the relationship between two qualitative variables when the expected count is less than 5 in more than 20% of cells. P -value $<$.05 was considered statistically significant.

3 | RESULTS

A total of 115 complete responses were recorded, all were ladies. The mean age was 73.18 ± 6.42 . Regarding marital status; 87 (75.7%)

What's known

- Developing new symptoms or suffering from prolonged symptoms after COVID-19 infection is being recognised (long covid).
- Elderly patients, and females especially, are more likely to develop complications from COVID-19.
- There are similarities between long covid and chronic fatigue syndrome.

What's new

- This survey targeted elderly females and aimed to investigate post-COVID-19 symptoms and whether they could be a risk factor for developing CFS later on.
- Participants who complained of fatigue, cognitive problems, recurrent falls, stress, sadness and sleep problems were significantly related to CFS possibility or probability.

were married, 6 (5.2%) were single/divorced, and 22 (19.1%) were widowed. When asked about education 6 (5.2%) had completed primary education, 45 (39.1%) had middle school, and 64 (55.7%) high school or higher. Eighty-nine (77.4%) reported having symptoms in the post-recovery period; of these 54 (47%) had no symptoms of CFS, 60 (52.2%) were possible, and only 1 was probable. Table 1 shows the frequency of symptoms reported in the post-recovery period. Of note fatigue was reported by 66 (57.4%) responders, musculo-skeletal symptoms by 56 (48.6%), and sleep problems by 73 (63.47%). Twenty-nine (25.2%) patients visited a doctor's office as a result.

The presence of post-recovery symptoms was significantly related to stress ($P = .005$), sadness ($P = .007$) and sleep disturbances ($P < .001$) whether increased, fractured or insomnia. Table 2 shows the relationship between the different kinds of post-recovery symptoms reported and CFS (as classified above). Stress, sadness, sleep disturbances, along with fatigue, cognitive impairment and recurrent falls were all significantly associated with CFS-like symptoms. However, duration till recovery and number of days passed since recovery was not related to CFS-like symptoms with P -values of .304 and .234, respectively.

4 | DISCUSSION

This survey targeted elderly females and aimed to investigate post-COVID-19 symptoms and whether they could be a risk factor for developing CFS later on. Symptoms persisted more than a month in 33% of the responders. This was somewhat higher than the findings of the "UK COVID Symptom study"² but closer to a multistate survey conducted in the US which found that 35% had not returned to their usual state of 2-3 weeks after testing negative for COVID-19.¹²

TABLE 1 Post-recovery symptoms reported (n = 115)

Symptoms	N (%)
Neurological	
Headache	14 (12.2)
Dizziness	9 (7.8)
Tingling and numbness	6 (5.2)
Headache and dizziness	5 (4.3)
Headache and tingling and numbness	1 (0.9)
Dizziness and tingling and numbness	5 (4.3)
Headache, dizziness and tingling and numbness	3 (2.6)
Total number of participants with these symptoms	43 (37)
Appetite	
Increase	11 (9.6)
Decrease	19 (16.5)
Total number of participants with these symptoms	30 (26.08)
Sleep disturbance	
Increase	14 (12.2)
Insomnia	28 (24.3)
Fractured	31 (27)
Total number of participants with these symptoms	73 (63.47)
Nasopharyngeal symptoms	
Loss of smell	3 (2.6)
Loss of taste	2 (1.7)
Sore throat	6 (5.2)
Hoarseness of voice	6 (5.2)
Blocked nose	6 (5.2)
Sneezing	0
Loss of smell and taste	14 (12.2)
Loss of smell and sore throat	1 (0.9)
Loss of smell, taste and sneezing	1 (0.9)
Loss of smell, taste and hoarseness of voice	1 (0.9)
Blocked nose and sneezing	3 (2.6)
Sore throat and blocked nose	1 (0.9)
Sore throat, hoarseness of voice and sneezing	1 (0.9)
Total number of participants with these symptoms	45 (39.13)
GIT problems	
Abdominal pain	8 (7)
Dry mouth	8 (7)
Diarrhoea	9 (7.8)
Nausea	3 (2.6)
Abdominal pain and dry mouth	1 (0.9)
Abdominal pain and diarrhoea	2 (1.7)
Abdominal pain and nausea	3 (2.6)
Dry mouth and diarrhoea	2 (1.7)
Diarrhoea and nausea	4 (3.5)
Total number of participants with these symptoms	40 (34.78)

(Continues)

TABLE 1 (Continued)

Symptoms	N (%)
Cardiac symptoms	
Chest pain	9 (7.8)
Palpitations	13 (11.3)
Chest pain and palpitations	12 (10.4)
Total number of participants with these symptoms	34 (29.56)
Respiratory symptoms	
Dyspnoea	20 (17.4)
Cough	10 (8.7)
Wheezes	6 (5.2)
Dyspnoea and cough	7 (6.1)
Dyspnoea and wheezes	1 (0.9)
Cough and wheezes	4 (3.5)
Total number of participants with these symptoms	48 (41.73)
Musculo-skeletal symptoms	
Joint pain	10 (8.7)
Weakness	12 (10.4)
Muscle pain	18 (15.7)
Joint pain and weakness	3 (2.6)
Joint pain and muscle pain	4 (3.5)
Weakness and muscle pain	2 (1.7)
Joint pain, weakness and muscle pain	7 (6.1)
Total number of participants with these symptoms	56 (48.6)
Nephrological symptom	
Renal stones	4 (3.5)
Recurrent urinary tract infections	3 (2.6)
Total number of participants with these symptoms	7 (6.08)
Stress	65 (56.5)
Sadness	55 (47.8)
Dry eye	16 (13.9)
Skin rash	9 (7.8)
Fever	7 (6.1)
Fatigue	66 (57.4)
Cognitive dysfunction	29 (25.2)
Recurrent falls	29 (25.2)
Incontinence	21 (18.3)
Post-recovery symptoms disappeared at time of survey	58 (50.4)

An Italian study reported that 87% of those discharged from hospital had at least one symptom 2 months later.¹³ Notably, only 25.2% of the participants recorded new doctor visits as a result of these symptoms. This discrepancy may point to a lack of awareness of the longer effects of COVID-19 infection. Advocating for active follow-up of COVID patients may seem justifiable.

Fatigue, musculo-skeletal symptoms, sleep problems, headache, cognitive problems, sore throat, malaise, dizziness and palpitations, among others were frequently reported by the responders. This

TABLE 2 The relationship between the post-recovery symptoms and chronic fatigue syndrome (CFS)

	CFS			Fisher's exact test
	No	Possible	Probable	P value
	N (%)	N (%)	N (%)	
Post-recovery symptoms present	39 (72.2)	50 (83.3)	0 (0)	.056
Neurological symptoms				
Headache	7 (12.96)	7 (11.67)	0 (0)	.703
Dizziness	5 (9.26)	4 (6.67)	0 (0)	
Tingling & numbness	2 (3.7)	4 (6.67)	0 (0)	
Appetite change				
Increase	4 (7.41)	7 (11.67)	0 (0)	.137
Decrease	6 (11.11)	12 (20)	1 (100)	
Stress	21 (38.89)	43 (71.67)	1 (100)	.001
Sadness	20 (37.04)	34 (56.67)	1 (100)	.037
Dry eye	7 (12.96)	9 (15)	0 (0)	.823
Sleep disturbance				
Increase	4 (7.41)	10 (16.67)	0 (0)	.005
Insomnia	11 (20.37)	17 (28.33)	0 (0)	
Fractured	10 (18.52)	20 (33.33)	1 (100)	
Nasopharyngeal symptoms				
Loss of smell	2 (3.7)	1 (1.67)	0 (0)	.149
Loss of taste	2 (3.7)	0 (0)	0 (0)	
Sore throat	2 (3.7)	4 (6.67)	0 (0)	
Hoarseness of voice	4 (7.41)	2 (3.33)	0 (0)	
Blocked nose	0 (0)	6 (10)	0 (0)	
Sneezing	0 (0)	0 (0)	0 (0)	
GIT problems				
Abdominal pain	3 (5.56)	5 (8.33)	0 (0)	.837
Dry mouth	4 (7.41)	4 (6.67)	0 (0)	
Diarrhoea	6 (11.11)	3 (5)	0 (0)	
Nausea	1 (1.85)	2 (3.33)	0 (0)	
Cardiac symptoms				
Chest pain	6 (11.11)	3 (5)	0 (0)	.294
Palpitations	4 (7.41)	9 (15)	0 (0)	
Chest symptom				
Dyspnoea	8 (14.81)	12 (20)	0 (0)	.864
Cough	6 (11.11)	4 (6.67)	0 (0)	
Wheezes	4 (7.41)	2 (3.33)	0 (0)	
MSK symptoms				
Joint pain	7 (12.96)	3 (5)	0 (0)	.104
Weakness	4 (7.41)	8 (13.33)	0 (0)	
Muscle pain	9 (16.67)	9 (15)	0 (0)	
Nephrological symptom				
Recurrent UTI	2 (3.7)	1 (1.67)	0 (0)	.629
Renal stones	1 (1.85)	3 (5)	0 (0)	
Skin rash	1 (1.85%)	8 (13.33%)	0 (0%)	.088

(Continues)

TABLE 2 (Continued)

	CFS			Fisher's exact test
	No	Possible	Probable	P value
	N (%)	N (%)	N (%)	
Fever	2 (3.7)	5 (8.33)	0 (0)	.473
Fatigue	5 (9.26)	60 (100)	1 (100)	<.001
Cognitive dysfunction	9 (16.67)	19 (31.67)	1 (100)	.032
Recurrent falls	9 (16.67)	19 (31.67)	1 (100)	.032
Incontinence	7 (12.96)	13 (21.67)	1 (100)	.077
Post-recovery symptoms disappeared	31 (57.41)	27 (45)	0 (0)	.189
New doctors' visits	11 (20.37)	17 (28.33)	1 (100)	.155

wide array of complaints was similar to those of Assaf et al who also surveyed prolonged COVID symptoms.¹⁴ The nature and closeness of these symptoms to CFS prompted us to study this relationship. Participants who complained of fatigue, cognitive problems, recurrent falls, stress, sadness, and sleep problems were significantly related to CFS possibility or probability.

Islam et al's review article also highlighted this potential link between post-COVID fatigue and CFS.¹⁵ Even though the exact aetiology of CFS is unknown there is agreement that it is a multifactorial entity that can be initiated by several factors. A recognised stimulus is viral infection. This causal association has been established with EBV, influenza and other coronaviruses. The mechanism proposed is triggering of inflammatory and autoimmune response as well as the resulting neurological sequelae of post-infectious neuro-invasion. Which in turn causes the clinical manifestations of CFS.¹⁶

Whether COVID-19 infection can initiate the same response has been discussed by several authors. Rodriguez et al confirmed that COVID-19 can cause a significant inflammatory and auto-immune response,¹⁷ and a Mexican cohort study found that symptoms of CFS overlapped significantly with those of long COVID syndrome.¹⁸

The limitation of this work is the small sample size and it only focuses on one subset of patients.

5 | CONCLUSION

From our findings, the presence of fatigue, cognitive impairment, stress, sadness, sleep disturbances and recurrent falls in the post-recovery period were all significantly associated with CFS-like symptoms. To conclude it would be reasonable to screen for long COVID and consider the potential for developing CFS later on. Whether it can be a risk factor for developing CFS-like other viral infections will need more larger scale studies to confirm this.

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DISCLOSURE

The authors have nothing to disclose.

DATA AVAILABILITY STATEMENT

Data available on request from the authors.

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APPENDIX

Post-COVID-19 symptoms survey

Congratulations on beating COVID-19. We just want to ask you a few questions about how you feel afterwards...

1. How old are you?
2. Are you married/single/divorced/widowed?
3. Regarding education, which best describes you
 - a. Primary school education
 - b. Middle school education
 - c. High school/higher education
4. Before being diagnosed with COVID-19 were you known to have any of the following conditions?
 - a. Depression
 - b. Chronic fatigue syndrome
 - c. Fibromyalgia
5. How were you diagnosed with COVID-19?
 - a. Symptoms only
 - b. Symptoms and PCR
 - c. History of contact and PCR
6. How long did it take for you to recover?
7. How many days have passed since your recovery?
8. Did you perform PCR to diagnose recovery?
 - a. Yes
 - b. No
9. Are you experiencing any symptoms or health complaints after recovery?

a. Yes

b. No

The following questions are about symptoms you have experienced or still experiencing after recovery:

1. Are you experiencing any new headaches, dizziness, tingling and numbness in hands and feet?
 - a. Yes (which one/s)
 - b. No
2. Were you diagnosed with any new neurological problem after recovery?
3. Are you experiencing any change in appetite?
 - a. No
 - b. Increase
 - c. Decrease
4. Are you experiencing increased stress levels or anxiety and worry?
 - a. Yes
 - b. No
5. Are you experiencing inexplicable sadness?
 - a. Yes
 - b. No
6. Are you experiencing any loss of smell, loss of taste, sore throat, hoarseness of voice, runny nose, blocked nose, or recurrent sneezing?
 - a. None
 - b. Yes (which one/s?)
7. Are you experiencing any new eye problems such as new-onset redness of the eye, new-onset or increasing dryness of the eye?
 - a. None
 - b. Yes (which one/s?)
 - c. Others (mention)
8. Are you experiencing any tummy problems such as pain, diarrhoea, nausea, dry mouth or vomiting?
 - a. None
 - b. Yes (which one/s?)
9. Are you experiencing any new heart troubles such as racing heart, chest pain?
 - a. None
 - b. Yes (which one/s?)
10. Are you experiencing any new chest problems such as pain, wheezing, breathlessness, cough or phlegm?
 - a. None
 - b. Yes (which one/s?)
11. Are you experiencing any new movement problems such as muscle pain, joint pain, or weakness?
 - a. None
 - b. Yes (which one/s?)
12. Did you experience any new kidney problems such as loin pain, or kidney stones?
 - a. None
 - b. Yes (which one/s?)

13. Did you experience any arterial or venous blockade (stroke, heart attack, sudden blindness, deep venous thrombosis)?
 - a. None
 - b. Yes (which one/s?)
14. Did you experience any new skin rash?
 - a. Yes
 - b. No
15. Did you experience any new fever?
 - a. Yes
 - b. No
16. Did you experience any unexplained tiredness?
 - a. Yes
 - b. No
17. Did you experience any confusion?
 - a. Yes
 - b. No
18. Did you experience any increased falling?
 - a. Yes
 - b. No
19. Did you experience any problems with your bladder control?
 - a. Yes
 - b. No
20. If you answered yes to the previous questions; have the symptoms disappeared yet?
 - a. Yes
 - b. No
21. How long did the symptoms take to disappear after your recovery?
22. Did you need to visit any new doctors for health issues after your recovery?
 - a. Yes (mention why?)
 - b. No