

Prevalence of Fatigue in Post Covid 19

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Abstract

Background: Following covid 19, most patients have variety of neurological symptoms (headache, dizziness, tinnitus, paraesthesia, sleep disorders, loss of taste and smell, mental fog, concentration issues, anxiety, depression) persisting even after resolution of fever, cough.

Fatigue is the most frequently described and globally recognized as a disabling symptom following covid. Fatigue reflects subjective state, decreased capacity to perform, decrement in vigilance. General psychophysiological phenomenon in which motivational decrement, diminished ability to perform tasks with alertness, vigilance is reduced. Several weeks after COVID 19, some patients are still dealing with lung complications and crushing fatigue. The long-term consequences of covid 19 are being studied. The aim of the study is to understand persisting fatigue, investigate associated risk factors, disease severity.

Materials and methods: COVID 19 post-acute outpatient clinic. Outpatients who met WHO criteria for discontinuation of quarantine i.e., no fever for 3 consecutive days, improvement in other symptoms, RT PCR negative.

Results: 19 of 53 patients reported of chronic fatigue syndrome. No association between severity of illness, inflammatory markers and fatigue. Persistent fatigue following SARS-CoV-2 is common and independent of severity of initial infection.

Conclusion: Fatigue persists after COVID 19. Identifying the type of fatigue, early interventions could reduce socio economic burden. Frequent follow up is required to identify long term consequences of covid 19

Keywords: fatigue, long covid, persistent symptoms, post-COVID-19 syndrome.

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Introduction

Various coronaviruses have in common structural similarities. [1] CoV particles are structurally spherical, diameter of 100nm. The spike protein S, integral membrane protein M, envelope E protein forms envelope enclosing nucleocapsid and nucleocapsid n protein binds to genomic RNA to form the nucleocapsid. [2]

ORF1a and ORF1b are characteristic among multiple ORFs in the genomic RNA of CoVs. Pseudo knot in which ORF1a and ORF1b overlap, this structure causes frame shift when ribosomes proceed with RNA translation. [3]

Virus entry across the BBB and olfactory mucosa into brain. [4]

Long COVID-19 may be defined as patients who, four weeks after the diagnosis of SARS-Cov-2 infection, continue to have signs and symptoms not explainable by other causes. [5] The estimated frequency is around 10% and signs and symptoms may last for months. [6]

SARS-COV2 virus that causes COVID 19 has new, recurring clinical findings after initial symptom after recovery. [7] There are various symptoms for post covid condition, long covid, post-acute covid, long haul covid, post-acute sequelae of SARS COV 2 infection. [8,9]

Following acute covid 19, patients experience various symptoms of fatigue, shortness of breath, cough, difficulty concentrating. For many persons with covid 19, fatigue is a common symptom. [10]

Several mechanisms proposed being inflammatory mediators, released at side of covid 19, transmitted as stress signals. [11] Research has found neurotransmitter receptor antibodies against Beta adrenergic and muscarinic receptors. They play a major role in multi organ illness persisting for months in patients with long covid 19. [9,11]

Fatigue reported as no able to get out of bed, or to work beyond few hours. [12] CFS is heterogenous disorder with the following criteria that often follows a viral infection or stress. [9] Research has shown impaired natural killer cell function and increased parameters of inflammation and pro inflammatory cytokines IL 1, IL 6, TNF are present. [13]

Table 1: chronic fatigue syndrome/myalgic encephalitis. Diagnostic criteria.

1. Chronic fatigue syndrome (essential criteria)
<ul style="list-style-type: none"> Substantial impairment in the ability to perform activities carried out prior to the disease for more than six months
<ul style="list-style-type: none"> Profound fatigue not relieved by rest
<ul style="list-style-type: none"> Discomfort or aggravation after physical exertion
<ul style="list-style-type: none"> Unrefreshing sleep
2. Chronic fatigue syndrome (at least one of the two additional criteria must be present)
<ul style="list-style-type: none"> Cognitive impairment (impairment of executive functions or thinking that worsens with exertion, stress or pressure)
<ul style="list-style-type: none"> Orthostatic intolerance (symptoms worsen when standing and improve when lying down or raising the lower limbs)
<ul style="list-style-type: none"> Patients who meet criteria for myalgic encephalitis must also have cognitive impairment.

Hypothalamic paraventricular nuclei causes microglia induced activation and neuroinflammation. This in turn affect hypothalamus and its proximal limbic system [9,13]. Redox imbalance reported in covid and fatigue syndrome. Imbalance between reactive oxygen species and antioxidant defense mechanism results in Oxidative stress. [14] Excess reactive

nitrogen species results in nitrosative stress

Several antioxidant enzymes are attacked by reactive oxygen species and excessive Nitrous oxide. [15]

In multiple cell types, metabolomic studies have shown evidence of impaired ATP production from oxygen, glucose and fatty

acids in multiple cell types. Biochemical pathways glycolysis, oxidative phosphorylation, urea and citric acid cycle are affected resulting in hypometabolic state. [16,17,18]

Definition of fatigue “an experience of tiredness, dislike of present activity and unwillingness to continue or as disinclination to continue performing task at hand and progressive withdrawal of attention from environmental demands”

Materials and Methods

Study design: collection of data prospectively in the department of psychiatry of a tertiary care hospital. This Study is a cross sectional study.

Study period: Jan 2021 to October 2021

Ethical committee clearance B14576. 3/2/2021.

Sampling method: continuous sampling

Study subjects: Participants aged 18 yrs. - 60 yrs. with a diagnosis of covid -19 admitted and follow up 3 months after diagnosis and rt-pcr negative. Ethical committee clearance for study undertaken

Inclusion criteria: Patients recovered from COVID 19 and who have completed a week’s period of quarantine after a negative antigen or RTPCR report or patients who are asymptomatic for a total of 17 days since diagnosis of infection, 3 months following recovery will be included in the study.

Exclusion: Patients with prior psychiatric illness, hypothyroidism, anaemia

Patient in whom 6 months have elapsed since a negative antigen or RTPCR report.

Reinfected patients. *Critical Illness:* Individuals who have respiratory failure, septic shock, and/or multiple organ dysfunction.

Study materials: Following informed consent, demographic details of patients

were collected. Further classified Mild, moderate, severe illness based on inpatient record

Instruments: FAS scale used for evaluating symptoms of chronic fatigue. Internal consistency.¹⁰ Each item of the FAS is answered using a five-point, Likert-type scale ranging from 1 (“never”) to 5 (“always”). Total scores can range from 10, indicating the lowest level of fatigue, to 50, denoting the highest. Five questions reflect physical fatigue and 5 questions (questions 3 and 6-9) mental fatigue.

FAS scores 10 - 21: no fatigue (normal)

- FAS scores 22 – 50: substantial fatigue

2 subgroups:

- fatigue: scores 22-34
- extreme fatigue: scores ≥ 35

Asymptomatic or Presymptomatic Infection: Individuals who test positive for SARS-CoV-2 using a virologic test (i.e., a nucleic acid amplification test [NAAT] or an antigen test) but who have no symptoms that are consistent with COVID-19. [11,12]

Mild Illness: Individuals who have any of the various signs and symptoms of COVID-19 (e.g., fever, cough, sore throat, malaise, headache, muscle pain, nausea, vomiting, diarrhea, loss of taste and smell) but who do not have shortness of breath, dyspnea, or abnormal chest imaging. [11,12,19]

Moderate Illness: Individuals who show evidence of lower respiratory disease during clinical assessment or imaging and who have an oxygen saturation (SpO₂) $\geq 94\%$ on room air at sea level. [11,12,19]

Severe Illness: Individuals who have SpO₂ $< 94\%$ on room air at sea level, a ratio of arterial partial pressure of oxygen to fraction of inspired oxygen (PaO₂/FiO₂) < 300 mm Hg, respiratory frequency > 30 breaths/min, or lung infiltrates $> 50\%$. [11,12,15]

Table 2: SPSS Output

	N	%
NO FATIGUE	34	64
CHRONIC FATIGUE	19	36
TOTAL	53	100

53 patients with covid 19 confirmed by a positive result from RTPCR on throat swabs confirmed by CT chest.

By now it is evident that covid 19 is not a localized infection but multisystem disease wherein there is interplay of inflammatory, immunological and coagulative pathways. [20, 21]

CT SS: scores 0, 1,2 based on parenchymal opacification involved 0%, less than 50% or equal to or more than 50 %. CTSS used to evaluate the severity of pulmonary involvement. [19,22]

Severe covid 19 associated with inflammatory biomarkers (crp, ferritin), increased leucocytes, neutrophils,

cytokines and decreased lymphocyte count [23,24].

Data analysis: Analysis using SPSS 11. Pearson correlation is used to find a correlation between 2 continuous variables.

Results:

Total number of subjects under the study was 53, among which 19 had chronic fatigue based on fas scoring. Hence the prevalence is 36%.

SPSS output:

CFS demographic profile of cfs group of the study:

Table 3: CFS

	n	%
No fatigue	34	64.2
Fatigue Yes	19	35.8
Total	53	100

Table 4: demographic profile of cfs group of the study

Demographic variables	n	%
Hospital		
Home quarantine	23	43.4
op	22	41.5
ip	8	15.1
comorbidities		
copd	1	1.9
htn	16	30.2
dm	6	11.3
Sud /alcohol	7	13.2
Sud/nicotine	23	43.4
Inflammatory markers		
CRP	30	56.6
D dimer	5	9.4
NLR	5	9.4
Serum ferritin	7	13.2
Paco2 low	6	11.3
CT SS		

2	6	11.3
0	32	60.4
1	15	28.3
residence	n	%
No need for oxygen	32	60.4
Need for oxygen	21	39.6
age group		
less than or equal to 28	10	18.9
29-38	14	26.4
39-48	14	26.4
more than 48	15	28.3

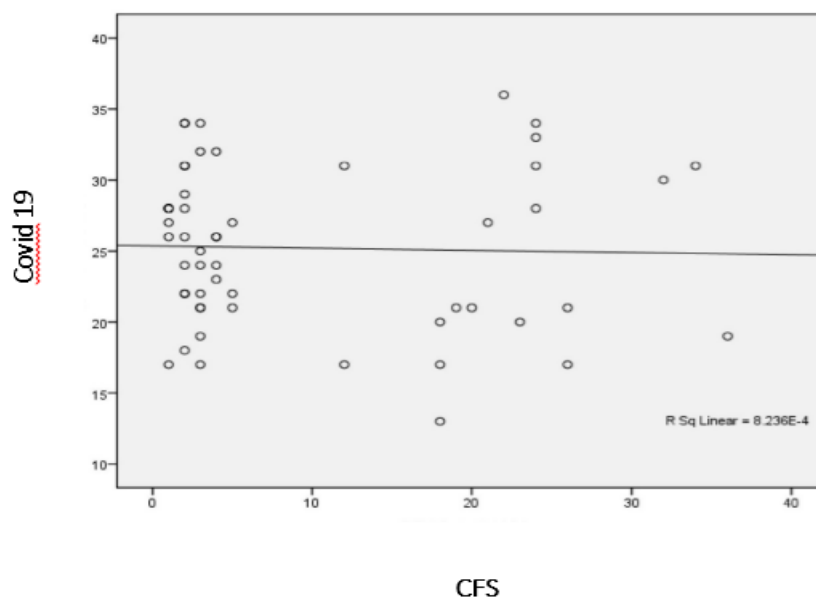


Figure 1: Scatter Plot

Table 5: Correlations

			covid	Fas SCORE
Spearman's rho	covid	Correlation Coefficient	1.000	-.098
		Sig. (2-tailed)	.	.484
		N	53	53
	Fas SCORE	Correlation Coefficient	-.098	1.000
		Sig. (2-tailed)	.484	.
		N	53	53

$r = -.098, p = .484$

Hence there is no significant correlation between the severity of covid and fas score

Discussion

SARS-CoV-2 is a virus manifestations of covid 19 [25]. First case occurred in Wuhan, China in November 2019. Who declared it as global pandemic on 11 march , 2020 are fever, sore throat, cough, dyspnoea, gastro intestinal issues, loss of

smell and taste [26,27]. Real time PCR using nasal swab used to confirm diagnosis . Computed Tomography is used for diagnosis and follow up. Individuals with covid 19 have variety of neuropsychiatric manifestations [28]

Fatigue is common complaint after infections because of the body fighting an infection like covid19. [29,30] . Persistent fatigue affects all areas of individual life [31,32].

The present study is a hospital based study. The present study has important limitations. Fatigue is significant feature of both acute and convalescent covid 19. 4 out of 10 reporting fatigue lasting for weeks and months 27.35 % cases in the sample of our study reported of fatigue similar to studies done earlier [33].

Even in Long term study of covid (1 year study), at the time of discharge, the most common symptom was fatigue (26.93%), followed by dyspnea (20.34%) and muscle pain (8.86%). Management of fatigue by multidisciplinary team with cognitive behavioral therapy and graded exercise therapy [34,35,36].

Conclusion.

Recovery after severe acute respiratory syndrome coronavirus 2, lot of patients experience many symptoms in different body systems.

Long covid people feel fatigued after minimal effort. To understand dimensions of fatigue , risk factors of chronic fatigue this study was done.

No association between severity of covid and chronic fatigue .Also no association between severity of covid and FAS score.

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Conflicts of interest There are no conflict of interest

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