



EVALUATION OF NEUROPSYCHIATRIC MANIFESTATIONS AMONG SURVIVORS OF COVID-19

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Abstract:

Aim of the study: The aim of the study is to evaluate neuropsychiatric manifestations among patients who survived COVID-19 and compare these symptoms according to the severity of the illness.

Methodology: This cross-sectional study was conducted among survivors of COVID-19 and recruited after at least 6 months of acute illness. They have been interviewed in the outpatient department of a Tertiary care Hospital in Karachi between March 2022 to October 2022.

Result: Among 304 patients, 176 were from mild disease and the rest were from other categories of COVID-19. The most significant symptom among all groups was anxiety at the time of acute illness and it also has a direct linear correlation with cognitive impairment with a significant p-value among all groups. While comparing with other neurological symptoms including loss of taste and smell, there was no significant correlation was found.

Keywords: COVID-19, neuropsychiatric manifestations

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Introduction:

Acute respiratory syndrome Coronavirus 2 became pandemic on March 11th, 2020, after emerging as a first case in late 2019 in Wuhan, a central province of China.¹ Like previous corona virus illnesses the main presentation attributed with development of dry cough, shortness of breath and fever. COVID pneumonia is the commonest terminology used for coronavirus infection.² It further categorized into asymptomatic, mild, moderate, severe, and critical. The categorization done according to oxygen saturation, respiratory rate, and blood pressure. Patients are labelled as asymptomatic when they are tested positive for PCR but having no symptoms. Mild cases are those with fever, cough, bodyache but having saturation above 94% and less than 50% involvement of lung on HRCT. Moderate are those whose saturation drops below 94%, requiring high flow O₂ with more than 50% involvement on HRCT. Patients with severe disease are those with saturation below 94% and respiratory rate >30, with need of non-invasive ventilation or mechanical ventilation. Critical are those who

develop respiratory collapse, respiratory failure and multi organ dysfunction.³

As the disease progresses it was found out that it's a systemic illness with involvement of almost every system of the body including cardiovascular, renal, gastrointestinal, hepatobiliary, nervous, and endocrine system.⁴ Regarding neurological manifestations it causes major neurological symptoms ranging from micro-infarcts to major infarcts, encephalopathies, and alteration of consciousness without any established cause.^{5,6} They also reported loss of taste, smell, lack of concentration and judgment.^{7,8} Besides neurological manifestations, psychiatric symptoms are also commonly seen among them. The major psychiatric symptoms include anxiety, depression, insomnia, traumatic distress, and severe anhedonia.^{9,10} These symptoms are also commonly seen among care takers and health care workers looking after them.¹¹

Aim of the study:

The aim of the study is to evaluate neuropsychiatric manifestations among patients who survive with COVID-19 and compare these symptoms according to severity of illness.

Methodology:

Data Source: Patients were collected from out patients department of a tertiary care hospital of Karachi. Patients were recruited between March 2022 to October 2022.

Study Protocol: Patients were analyzed after approval from local IRB. They were analyzed for age, gender, and groups of COVID-19 in relation to severity of illness. Severity of the illness has been categorized as mild, moderate, severe, and critical as per CDC. The neuropsychiatric symptoms were added according to DSM-V classification. All patients recruited after at least 6 months of acute illness with corona virus.

Study Population: Patients of each gender with positive PCR for COVID-19, of age 16 years and above, of any socioeconomic status were included in the study.

DATA Analysis: The DATA was analyzed on SPSS23, after calculating sample size of 304. The sample was analyzed with the help of T-test.

Result:

Out of 306 patients recruited in the study 154 (50.3%) were males, while 152 were females. The age range among them was 17-82 years with mean age of 37.04 + 17.16. Most of the patients incurred in the evaluation were from mild disease i.e. 57.5%. (Table 1). The commonest symptom at the time of acute illness was anxiety, followed by loss of taste and smell with significant p-value in all symptoms (table 2).

At 6 months and more of COVID-19, symptoms of anhedonia, psychomotor agitation and lack of energy were the commonest with significant p value in all (table 3). In relation, cognitive function derangement memory loss, decision making, reasoning and planning were all more significant in patients with moderate to critical

category. Although p was quite significant among all (table 4).

Discussion:

The nature and extent of persistent neuropsychiatric symptoms after COVID-19 is under discussion since the emergence of COVID-19. Evaluation of these symptoms includes central and peripheral nervous system as well as musculoskeletal and psychological manifestations. Any of these may present in acute illness and remain persisted for months. Patients who survived with the acute illness are more prone to develop psychiatric symptoms and even disorders.¹³ Most of the viral illnesses with respiratory symptoms may experience psychiatric symptoms but these are most marked among patients with COVID-19 when followed up after 6 months.¹⁴ Persistent symptoms after COVID-19, illness has been called long COVID, which is defined and proposed to range from 3-12 weeks after infection.¹⁵ The current study highlights the potential long term neuropsychiatric symptoms among survivors of the illness. To our knowledge, this is the first evaluation done on neuropsychiatric manifestations among survivors of Covid-19, in our region. Most of the patients incurred in the study were from mild group (n=176).

With acute illness the central symptoms including headache and dizziness were evident in almost all patients of covid-19, just like other viral illness. Most of the patients admitted with COVID-19 had new onset neuropsychiatric symptoms, including cerebrovascular accidents, change in behavior mostly developing anxiety or depression, decreased cognition, or alteration of mentation.¹⁶ The other central nervous system manifestations including thrombotic events were also seen among various patients with high mortality among them. In our evaluation among survivors of covid-19, headache and dizziness were common in all patients and dizziness persisted even later. A review on these patients done previously

showed almost 25% positivity of these symptoms among admitted patients.¹⁷

The commonest manifestations among peripheral nervous system, loss of taste and smell was seen across the world. And these two symptoms were also persisted even later.¹⁸ In our study more than 50% in each category of COVID-19 had these symptoms at the time of presentation though not persisted beyond 4 week (table2). Anxiety was the main psychiatric symptoms among these patients and that proves our evaluation too. In each category more than 50 % had it. The same pattern was evident in various studies done before.¹⁹ In one evaluation around 60% had loss of smell along with anxiety, depression and myalgias.²⁰ Although opposite response was also seen among patients in different studies done before with only 4.6%²¹ and 8%²⁰ although sample size was very less in these studies. The other psychiatric symptoms according to DSM V classification were evaluated and all were statistically significant in each group.

A potential strong relationship between COVID-19 and memory impairment seems to co-exist not only during the acute illness but also as part of long COVID syndrome. In our evaluation we find the same linear co-relation among them, although we have evaluated the survivors only. In each category of the illness memory loss was found although less specific among mild cases with presence among only in 22% and more than 50% in rest of the groups. Although having significant p value among all. Regarding all other cognitive function, quite evident among all groups, with lesser in mild cases. In various studies done among COVID-19 patients also disclose the same pattern which is matching the effects of other viral illnesses.²² There is a significant co-relation found between patients with anxiety at the time of acute illness with cognitive decline with p-value of 0.001 among all variables although when assessed with 2 other neurological symptoms

we couldn't find a significant co-relation among all.

Conclusion:

Neuropsychiatric symptoms are not only evident during acute illness but also later. In most studies conducted previously, as well as our evaluation has approximately the same results. With predominance of lack of energy and anxiety. Whereas cognitive impairment was more pronounced among severe illness. With this analysis again, vaccination should be encouraged among all including booster doses as it helps decreases the severity of illness.

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Table 1. Age Range among different categories of COVID-19

	Total no of cases	Male	Female	Age Range
Mild cases	176	86	90	32.03+13.78
Moderate cases	42	21	21	37.04+16.76
Severe cases	50	26	24	48.50+18.73
Critical cases	41	20	21	36.24+19.16

Table 2: Symptoms during acute illness of COVID-19

	Anxiety	p-value	Loss of taste	p-value	Loss of smell	p-value	
Mild (n- 176)	104 (59.09%)	.058	100 (56.82%)	0.129	98 (55.68%)	0.166	
Moderate (n=42)	37 (88.09%)	.004	23 (54.76%)	0.699	22 (52.38%)	0.529	
Severe(n=50)	41 (82%)	.033	27 (54%)	0.584	30 (60%)	0.626	
Critical(n=41)	33 (80.48%)	0.095	28 (68.29%)	0.134	26 (63.41%)	0.364	

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Table 3: Neuropsychiatric symptoms among survivors of COVID-19

	Mild cases	Moderate cases	Severe cases	Critical cases	
Anhedonia	48.29% (.007)	59.52% (.968)	86% (.001)	80.48% (.004)	
Sleep Disturbances	38.63% (.001)	71.42% (.004)	68% (.008)	63.41% (.088)	
Weight change	28.97% (.001)	59.52% (.003)	44% (.389)	51.22% (.074)	
Appetite disturbances	(.001)	64.28% (.021)	60% (.057)	56.09% (.066)	
Psychomotor agitation	35.79% (.001)	78.57% (.001)	80% (.001)	82.92%(.001)	
Lack of energy	57.38% (.006)	69.05% (.001)	88% (.002)	75.61% (.347)	



Table 4: Cognitive impairment among survivors of COVID-19

	Mild cases	Moderate cases	Severe cases	Critical cases	
Lack of decision making	21.59% (.001)	42.85% (.341)	46% (.001)	58.53% (.001)	
Memory loss	22.16% (.001)	45.24% (.121)	58% (.001)	48.78% (.041)	
Planning impairment	15.90% (.001)	23.80% (.910)	40% (.005)	41.46% (.007)	
Reasoning impairment	13.64% (.001)	28.57% (.585)	44% (.001)	48.78% (.001)	

