



Case Series

Uncommon Events of Fall and Mood Changes Observed in Post-COVID-19 Patients: A Case Series

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ABSTRACT

Coronavirus disease 2019 (COVID-19) infection in some patients has been documented to cause acute central nervous system (CNS) affection, or CNS depression, even in the absence of demonstrable hypoxia. These observations indicate that there may be some direct effect of the virus on CNS. In this case series of cured post-COVID-19 cases, mood changes like elation, depression, and emotionally labile state have been reported in three previously healthy individuals. The mood changes are waning very slowly in them with the passage of time. All of them also sustained fall sometime following acute COVID-19. Fall is considered to be an event indicating frailty and old age, and there is no mood change associated with fall in that population. Here, the three cases are being reported because neither fall nor mood changes during post-COVID-19 phase have been reported as yet to the best of our knowledge. The case series is worth reporting to generate awareness about the matter in the scientific community and also to indicate that further research in this field is required either to accept or to reject any correlation between COVID-19 infection and fall or mood change in otherwise healthy individuals, which can even be due to some direct effect of the virus on CNS.

Keywords: Post-COVID-19, Emotional, Fall, Mood change, Affect

INTRODUCTION

Coronavirus disease-2019 (COVID-19) has a wide range of presentation. Long COVID-19 has dangerous consequences with multisystemic affection.^[1,2] COVID-19 is a peculiar infection that cannot be ruled out by negative reverse transcription polymerase chain reaction (RT-PCR) report alone.^[2] Again, clinical cure is not complete when a patient positive for COVID-19 turns negative for the test.^[2] Literature does mention about *brain fog*, which is characterized by loss of recent memory, confusion, or features related to stroke and agitation. These features are basically observed in acute phase of the disease in most of the time, and may continue for long time, maybe for months after the patient is cured^[1] (WHO webpage). Affect and mood change following cure of COVID-19 have not been reported so far, to the best of our knowledge. Unexpected *fall* in absence of other comorbidities, which is usually considered to be a geriatric health condition, has also not been reported in the setting of postacute stage of COVID-19 (PubMed, Medline search). Here, we present a case series of three cases with common features of fall and mood change possibly related to COVID-19 infection after apparent cure of the patient.

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CASE 1

A 70-year-old man of strong built was in good health and was happily enjoying his retired life. He had mild hypertension that was controlled by medication. He had no diabetes or any other comorbid condition. He developed mild fever for a few days in January 2021 after 2 weeks of receiving first dose of vaccination for COVID-19. He was tested positive for COVID-19 at that time by COVID-19 RT-PCR. Home monitoring of oxygen saturation (SpO_2) always was above 95%, pulse and blood pressure (BP) were within normal range, temperature was below 100°F, and he was cured uneventfully maintaining home isolation protocol without any residual problem apparently.

Two weeks following the fever he had a fall at his home. He was afebrile and without any particular symptom at that time. He fell flat on the floor without loss of consciousness, but could not get up on his own at all. BP was 130/80 mmHg, SpO_2 was 97%, and no breathing distress or any other remarkable clinical feature was observed. He was then admitted to a hospital and COVID-19 RT-PCR at that point of time came negative. Blood biochemistry was all within normal range except low serum sodium (125 mEq/L). Brain computed tomography (CT) scan revealed normal study and excluded intracranial hemorrhage and features of head injury.

After 7 days of treatment with sodium supplementation and other supportive measures, he was allowed to go home. He could walk upstairs to his second-floor apartment with assistance. He recovered uneventfully. His appetite was unusually good, but a remarkable feature developed in him, that is, his mood was always elevated in the first few weeks of the recovery. His affect was now childish and he became emotionally labile to a remarkable extent. It is worth to mention here that before the episode of sickness he normally possessed an unremarkable composure of adult male. Later, he was fully immunized in due time, has no other persistent physical problem now, and emotional change has reduced but has not come back to pre-COVID-19 level, as reported by his family members and as observed by his physician. Worth to mention is that, no negative socioeconomic or family related event has happened to him or his family in the epidemic time. Therefore, the change in affect is the most persistent change in him.

CASE 2

In October 2020, an unvaccinated 59-year-old male doctor became febrile, was positive for COVID-19, got admitted to hospital with SpO_2 of 95% after 6 minutes of walk, and received oxygen by nasal prong for 1 day, doxycycline 100 mg twice a day for 5 days, and ivermectin 200 mg/kg body weight for 5 days as per the existing protocol of that time. He

received methyl prednisolone orally, a short course of 7 days with low dose. No cytokine storm was evident in him in the course of the disease. He had no loss of memory or confusion during acute phase. Recovery was uneventful, but he became emotionally labile, slightly paranoid in behavior, depressed, and forgetful in the postacute phase after release from hospital. After joining work a few weeks afterward, he was found to make mistakes frequently while using smartphone for various purposes and was clumsy regarding handling money. Change in affect was remarkable, especially the depression and mood swing. Recovery in mood swing is only partial to date, which means more than 1 year already from the acute illness but his problems are still there. He is well built, nonalcoholic, with no history of substance abuse or addiction.

After 10 months of recovery, he had a fall in washroom with total amnesia about what actually happened to cause the fall. He bled profusely from a cut on forehead following the fall. His vitals were normal on examination at that time. BP was 115/80 mmHg, random blood sugar 135 mg/dL, SpO_2 97%, pulse regular, and rate 85/min. All the investigations including CT scan of brain, cardiac profile including electrocardiogram (ECG), and serum markers like troponin T, blood count, C-reactive protein (CRP), serum urea, creatinine, and other basic tests yielded normal result. No other event happened after that.

He is now doing well, working, but showing some mood changes persisting till now, which, however, is waning gradually but very slowly.

CASE 3

A 90-year-old nondiabetic unvaccinated male widower became COVID-19 positive along with all other members of his family in June 2020. Patient had a mild febrile episode only with no respiratory or gastrointestinal symptoms; SpO_2 was always above 95%, with a good high-resolution CT (HRCT) and having no cytokine storm. He was admitted to a hospital as per protocol because he was elderly, but was kept under observation without any medication and was released in a few days since his blood count was normal, CRP was elevated only slightly, HRCT was normal, and serum ferritin was not elevated. He only had brain fog and mood swing as residual illnesses when he was discharged from the hospital. Anger, unstable mood, and tendency to splurge money without rationality were the newly acquired features of his personality.

He was doing well for quite a few months before having a fall in his home by December 2021 that caused clavicular and left-sided rib fracture. The latter caused lacerated injury to his left lung. BP, ECG, and blood tests revealed no abnormalities. However, he again tested positive for COVID-19 incidentally when tested routinely 12 days after admission, which was probably hospital acquired. No change was seen in CT scan

brain. He became COVID-19 negative when tested after 17 days. He underwent extensive home-based rehabilitation for a month. Fractures have not healed completely but he can perform basic life-skills independently without assistance.

Now his mood is near-normal for an old man, according to his family members, but was the most persistent residual feature.

DISCUSSION

Having no specific change in brain imaging in all these cases described above, scientific explanation behind the events of fall or mood changes remains unexplained in every case.

Fall is a definite entity that can be subdivided into physiological and pathological: physiological fall happens in old age due to disorders of sight, hearing, balance deficits, and musculoskeletal alterations of old age; and pathological conditions related to fall can be neurological, cardiovascular, endocrine, psychiatric, and iatrogenic.^[3] Extrinsic causes of falling are environmental factors such as obstacles and inadequate footwear.^[3] Vascular microinfarcts are detectable in fall associated with senile or hypertensive individuals; loss of brain matter is a feature in them.^[4] Behavioral change is a known feature of dementia, which could be a clinical differential diagnosis.^[5] But no brain atrophy or microinfarction is evident in our cases, which rules out organic causes apparently in the reported cases.

Interestingly, mood changes in these patients are waning without any medication, and are not progressive as it is expected in dementia or other neurodegenerative conditions. Hence, in our cases the features are probably due to some temporary changes in brain, which may be due to the effects of direct central nervous system (CNS) affection of COVID-19 infection and probably not related to progressive vascular obstruction.

All of these patients had essentially normal cardiovascular system and steady BP of normal range before their illness. All of the patients were previously healthy and were never frail or infirm. Predisease state BP and blood sugar levels were normal in all the patients and same is true for post-COVID-19 phase.

Neither any reporting on mood change in postacute COVID-19 syndrome and its natural course nor any reporting on fall in these patients has been found in literature (PubMed, Medline).

This case series is providing observational findings for analytical study in future on fall and mood changes, which is apparently related to COVID-19 in our cases. We opine that awareness about the issue is important. Since all the doctors, irrespective of their fields of expertise and subspecialties, had to attend COVID-19 cases during epidemic time and since consultation from neuropsychiatrist for specialist evaluation was absolutely inaccessible at that time, no such evaluation could be done in these cases. Accepting this fact as a specific weakness of the study, still we find these cases are worth reporting because further research in this field is required either to accept or to reject any correlation between COVID-19 infection and fall or mood change. These features could even be due to some direct effect of the virus on CNS. No magnetic resonance imaging of brain was done in any of these patients but CT scan was done in context of fall to evaluate if there is any head injury. No organic or metabolic causes could be related to these changes of this series.

CONCLUSION

Following COVID-19 infection, a few cases of changes in affect and occurrence of fall were noted that warranted reporting to generate awareness and for future research.

Conflict of interest

None declared.

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