

Case Report

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Mental Health Disorder Post-COVID-19 Infection: A Case Report

José Augusto Camargo^{1,2*}, Stéfani Augustoli Morcillo³ and Bernardo Savaya Lima³

¹Neuroscience Research Institute, Newclin Medical Clinic, Sorocaba, São Paulo, Brazil

²Professor, MD, PhD. Faculdade de Medicina, Pontifícia Universidade Católica de São Paulo, São Paulo, Brazil

³Faculdade de Medicina, Pontifícia Universidade Católica de São Paulo, São Paulo, Brazil

ABSTRACT

Background: Psychotic disorder is characterized by cognitive decline that compromises functioning of the individual. Its symptoms include speech disorganization, psychomotor and behavioral changes, delusions, and hallucinations. The condition can be associated with dissociative manifestations. In the case of an acute psychotic episode, the causes are diverse and include trauma, substances, mood or schizophrenic disorders, and other physiological conditions. Psychological therapies are indicated for treatment.

Case Presentation: A 45-year-old previously healthy man contracted COVID-19 at the beginning of 2021. The patient had headache, fever, pulmonary alterations, and taste and smell changes. After 5 weeks, the patient started to experience periods of mental confusion, disjointed speech, aggression, and psychomotor agitation, which progressively worsened. In view of drowsiness upon neurological examination and the lack of changes in other imaging tests, the patient underwent a PET/CT scan that showed cerebral hypometabolism in the frontal lobes, more evident in the mesial portion, including the anterior cingulate gyrus, and in the superior portions of the parietal lobes.

Conclusion: We found a clear association between previous COVID-19 infection and the development of a psychotic episode with dissociative manifestations after a few weeks. However, more studies are needed to better elucidate the results.

*Corresponding author

José Augusto Camargo, Neuroscience Research Institute, Newclin Medical Clinic, Sorocaba, São Paulo, Brazil.

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Introduction

Psychotic disorder is characterized by a significant decline in the functioning of the individual that involves cognitive areas. The primary symptoms of this condition are demonstrated by deficits in reality testing and include speech disorganization, psychomotor alterations, delusions, hallucinations, negative symptoms, behavioral changes, controlling actions, and passivity [1,2].

Reviews indicate that two-thirds of subjects with non-affective psychosis exhibit correlated dissociative symptoms such as derealization, depersonalization, absorption and amnesia [3,4]. These dissociative symptoms have a polygenic origin and are associated with a higher risk of suicide. A reduction in the thalamus and hippocampus associated with a controversial increase in oxytocin are biomarkers of the pathology [5]. Thus, acute psychotic episodes can have different etiologies, including schizophrenic conditions, mood disorders (manic or depressive psychosis), or perception disorders resulting from traumas, abuse or substance withdrawal [6]. When psychosis is caused by another medical condition, a physiological basis precedes it and a clinical neuropsychological diagnosis is essential [1].

With respect to the treatment of psychotic symptoms, psychological therapies have been shown to be effective. Third-wave therapies such as Acceptance and Commitment Therapy (ACT) and Metacognitive Training (MCT) would be superior to second-wave therapies (Cognitive Behavioral Therapy). While MCT aims to reduce positive symptoms and to increase metacognitive domains, ACT is focused on reducing readmissions, as well as hallucinations and delusions [7].

We report the case of a 45-year-old male patient who manifested a dissociative psychotic episode as a result of COVID-19 infection.

Case Presentation

A 45-year-old male patient, the financial director of a multinational company, was referred to our clinic for neurological assessment in mid-2021 with a history of COVID-19 at the beginning of that year. Family members reported headache, fever, significant lung involvement, and smell and taste changes. On that occasion, the patient was admitted to the hospital for treatment without the need for orotracheal intubation and was discharged 8 days later after general improvement of his clinical condition.

Five weeks after the infection, the patient started to experience periods of mental confusion, uncontrollable aggression and psychomotor agitation, and disjointed speech that progressively

worsened. The family members therefore sought neurological medical care. The patient did not smoke or used drugs, consumed alcohol socially, performed regular physical activities, and had no history of medical treatments or continuous medication use. The professional requested a brain tomography scan, magnetic resonance imaging and cranial magnetic resonance angiography, which did not show significant changes. Thus, the family members were advised to seek psychiatric assessment. The patient was diagnosed with a “dissociative psychotic episode” and received specific guidance prescribed by the professional. Since there was no significant improvement despite the use of numerous medications, the family came to our service to obtain a second opinion. Neurological examination revealed no apparent motor or sensory deficits, only slight drowsiness due to the use of the medications. Therefore, for better evaluation and diagnostic clarification, we requested a neurological positron emission tomography/computed tomography (PET/CT) scan, which showed cerebral hypometabolism in the frontal lobes, more evident in the mesial portion, including the anterior cingulate gyrus, and in the upper portions of the parietal lobes (Figures 1 and 2).

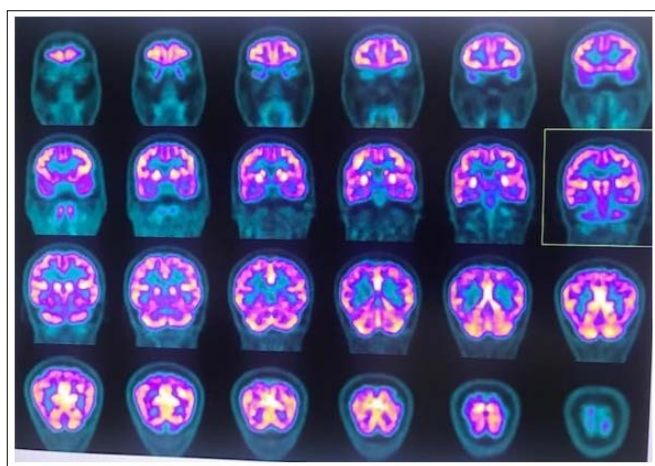


Figure 1: Neurological PET/CT: Coronal Images

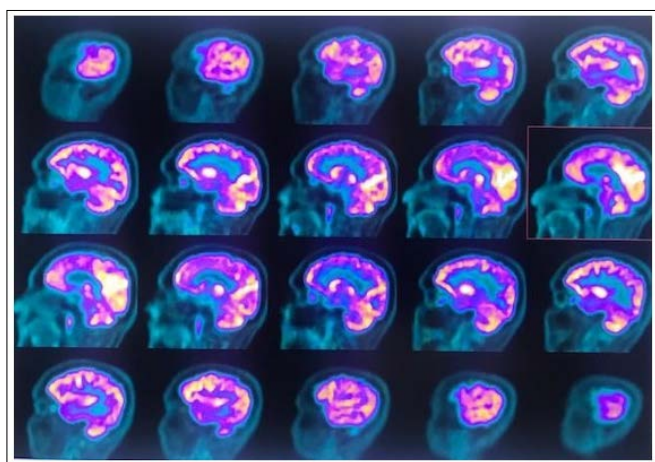


Figure 2: Neurological PET/CT: Sagittal Images

Discussion

The acute respiratory infection caused by SARS-CoV-2, called COVID-19, is one of the leading diseases in the current era of medicine. The infection started 31 December 2019 in China and COVID-19 was declared a pandemic in March 2020, which led to social isolation worldwide [8]. The pandemic had a significant impact on the mental health of the population; thus, maintaining individual follow-up was beneficial for well-being and was directly

associated with the chronicity of symptoms [9,10].

Brazilian epidemiological studies revealed the occurrence of 38,784,007 million cases of COVID-19 since 2020, totaling 711,792 deaths, with a fatality rate of 1.8%. Until April 2024, a total of 6,165 cases and 142 deaths had been reported, demonstrating that the disease still generates diverse socioeconomic consequences and consequences for population health [8].

SARS-CoV-2 is a coronavirus whose incubation period ranges from 2 to 14 days. The virus is transmitted through saliva droplets and secretions from contaminated mouth/nose, mainly by coughing and sneezing. The main signs and symptoms include a runny nose, cough, odynophagia, dyspnea, nasal congestion, fever, hyposmia, and dysgeusia. As observed in other infectious diseases of the respiratory tract, there is a broad individual spectrum of symptoms and consequences of COVID-19. Thus, cases can range from asymptomatic to death depending on factors such as genetic changes, viral load, immunodeficiencies, and comorbidities [11]. Furthermore, SARS-CoV-2 can affect the most diverse organs and structures, such as the cardiovascular system and digestive and urinary tracts. Within this context, patients with pulmonary sequelae exhibit dyspnea and post-discharge fatigue due to the association with pulmonary fibrosis or bronchiolitis obliterans. In addition, the systemic inflammatory process resulting from the infection can cause fibrosis and renal alterations, aggravating pre-existing diseases or leading to acute kidney failure [12].

Patients with neurological complications exhibited persistent hyposmia and dysgeusia, in addition to headache and changes in memory, cognition and behavior, anxiety, and depression [12]. Dissociative symptoms, psychotic episodes, parkinsonism, Sydenham’s chorea, and even the development of post-traumatic stress have also been reported. This phenomenon, known as neurological post-acute sequelae of SARS-CoV-2 infection (neuro-PASC), has gained greater proportions, although its mechanisms are not yet well understood. The main hypotheses include a direct effect due to infection of the central nervous system by the virus and an indirect effect caused by peripheral inflammation; the latter probably arises from the cytokine storm that is triggered or even from the involvement of angiotensin-converting enzyme 2 receptors [13-20].

Structural changes may also occur and PET-CT examination is therefore useful during the course of the disease [21]. In cases of post-COVID-19 sequelae, this imaging method demonstrates a significant reduction in brain metabolism; in addition, changes in neuropsychological tests are observed. The regions affected are diverse and correlate with the symptoms reported by patients. The areas showing hypometabolism include insula, amygdala, thalamus, hippocampus, trunk, pons, and olfactory gyrus [22].

In a patient with psychotic episodes and psychomotor alterations, PET-CT showed hypometabolism in the cerebellum, thalamus, anterior cingulate cortex, basal ganglia, and parietotemporal lobes. In the present case, we also found hypometabolism in the superior region of the parietal lobes and in the frontal lobe, particularly in the anterior cingulate gyrus, corresponding to the clinical presentation of a psychotic episode. Therefore, PET-CT is a useful tool to differentiate some diseases such as dementia and depression, as well as to assess the response to treatment [23].

In this study, we demonstrated that a previously healthy patient without reported comorbidities and drug use acquired a neuropsychiatric pathology as a result of COVID-19 infection.

The initial clinical presentation of fever, headache, taste and smell changes, and pulmonary sequelae had direct repercussions after 5 weeks, including aggression, disjointed speech, agitation and mental confusion, without any other complications or associated illnesses during this period.

Conclusion

An increasing number of studies is trying to elucidate the repercussions that COVID-19 continues to cause. Taken together the mental, physical, and imaging findings of the present case, we can establish a strong relationship between the dissociative psychotic episode and SARS-CoV-2 infection. However, more studies are needed to further validate the results.

Ethics Approval and Consent to Participate: Not applicable.

Human and Animal Rights: Not applicable.

Consent for Publication: Patient's consent to report this case has been obtained on the condition that all details that would enable any reader to identify the person have been omitted.

Availability of Data and Materials: The data supporting the findings of the article is recorded in the medical records of the treating service (Instituto de Neurosciences, Newclin Clinical Medical especializada de Sorocaba, São Paulo, Brazil) and is confidential.

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Conflict of Interest: The authors declare that they have no competing interests.

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