CLINICAL CASE REPORTS

A Case of Amnesia after SARS-CoV-2 Infection

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ABSTRACT

Introduction: SARS-CoV-2 infection can manifest with neuropsychiatric symptoms since the virus can reach the central nervous system. As for the occurrence of memory disorders in these patients, data are very scarce in the literature.

Case Description: We describe the clinical case of a male adolescent who presented amnesia after infection with SARS-CoV-2. The amnesia had a peculiar pattern, not described in the literature. The neurological exam and complementary diagnostic exams showed no changes. The most likely diagnosis was Dissociative Amnesia. The patient was medicated with psychotropic drugs, with remission of symptoms.

Discussion: Psychiatric disorders have been associated with COVID-19 infection, as well as with the pandemic state itself. It is assumed that the etiology of amnesia could be multifactorial: due to the direct effect of the virus and due to the negative impact associated with the pandemic. With this case report, we question the role of SARS-CoV-2 infection in mental health.

Keywords: adolescent mental health and COVID-19; COVID-19 and mental health; memory disorders and COVID-19; psychiatric disorders and COVID-19; SARS-CoV-2 infection

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INTRODUCTION

Amnesia is defined as a partial or total inability to recall past experiences and events, and its origin may be organic or psychogenic.[1] Organic amnesia is associated with the presence of brain disease and can be classified as anterograde when there is an inability to acquire new information after the brain injury or retrograde when there is an inability to remember information that preceded the injury.[1] On the other hand, psychogenic amnesia (also described as functional or dissociative) can occur in individuals without brain disease.[1]

According to the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 5th edition), the main feature of Dissociative Amnesia (DA) consists in the inability to recall important autobiographical information, usually of a traumatic nature, that is inconsistent with ordinary forgetting.[2] Amnesia can present different patterns, with localized amnesia (inability to remember events during a limited period) being the most common form of DA.[2] On the other hand, generalized amnesia is rare.[2,3] In selective amnesia, the individual can recall some, but not all, events during a circumscribed period.[2] Symptoms cause significant distress or impairment on important areas of functioning.[2] The disturbance is not attributable to neurological or medical conditions nor to the influence of psychoactive substances.[2] It differs from permanent amnesias due to neurobiological damage or toxicity as it is always potentially reversible.[2] There is a discrepancy between the memory deficit and the preservation of personality and social skills, so the individual has a normative behaviour.[1] The extent of amnesia often varies from day to day and between investigators.[3] The affective states that accompany DA may vary; however major depression is rare.[3] Perplexity or extreme anxiety may be evident, as well as the opposite, a calm acceptance of the memory loss.[3] According to the ICD-10 classification (International Classification of Diseases, 10th revision), the DA also has the same diagnostic criteria as the DSM-5.[3]

Several neurological manifestations have been associated with SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) infection, knowing that this virus can affect the central nervous system (CNS).[4,5] Concerning the occurrence of memory disorders in patients with coronavirus disease 19 (COVID-19), data are scarce in the literature, however, cases of Transient Global Amnesia (TGA) have been described.[6] Other authors hypothesize that TGA can be triggered by the stress associated with the social isolation that comes from confinement, uncertainty about the future, and fear of contracting COVID-19.[7] Several studies reported a significant percentage of patients with psychiatric disorders after COVID-19, as well as sequelae with neuropsychiatric symptoms, whose pathophysiology is still unknown.[8]

With this article, we intend to present a clinical case characterized by amnesia after COVID-19 infection. It is considered a relevant case presentation in the context of the pandemic, helping to better understand a rare psychiatric manifestation in the population of patients with COVID-19.

CASE DESCRIPTION

We present an adolescent male with no relevant personal or past family medical history. He was diagnosed with SARS-CoV-2 infection with mild symptoms (fever, myalgias, cough, and hyposmia). Thereafter the patient showed marked anxiety and fear of a fatal disease, followed by concerns about social isolation since he had to be confined out of his residence, due to the lack of sanitary conditions. He attended the emergency department twice with anxious and somatic symptoms, generalized tremors, a feeling of lack of strength in the lower limbs, as well as complaints of “lack of memory”. The respiratory symptoms of COVID-19 resolved in a week. A few days after, the patient presented with selective retrograde autobiographical amnesia, namely the inability to recall some life events in the past two years, such as a trip abroad, the birth of his nephew, or the new school facilities. However, he maintained his memory regarding identity and the provision of self-care. It had a marked functional impact at school, including at personal and social levels. For instance, he had trouble remembering teachers and colleagues, as he had suffered bullying from his peers. He also reactively developed depressive symptoms, as well as suicidal ideation. One month after COVID-19 he was admitted to a Child and Adolescent Psychiatry inpatient unit after a suicide attempt.

During hospitalization, a peculiar pattern of amnesia was noted: after a night of sleep, the patient reported having no memory of the previous day. Every day he asked where he was and who were the other hospitalized children and the health professionals. However, he recalled some events with affective importance to him, remembered his nuclear family, and was able to retain new information learned throughout the day. There was no change in the state of consciousness, and he always presented a normative functioning.

The patient underwent a neurological examination which revealed no changes. In the evaluation of neurocognitive functions, alterations in attention, naming, and amnesia were detected for some autobiographical events, but with several incongruities, remembering certain events on one day and not on another, with marked anxiety and a tendency to give up during the evaluation.

The complementary diagnostic exams did not show relevant alterations, namely complete blood count with serology and study of the autoimmunity, electrocardiogram, computed tomography (**Figure 1**) and magnetic resonance imaging of the brain (**Figure 2**), and an electroencephalogram. A formal neuropsychological assessment was carried out 6 months after COVID-19 infection which showed significant changes in measures of processing speed and psychomotor control, sustained attention for long periods, working memory, encoding of visual information for further processing and verbal initiative. The cognitive alterations seem to be

exacerbated by the presence of a need for self-verification of his ability to reason. It reveals long-term storage and learning capacity.During the neuropsychological assessment, he presented marked performance anxiety, which may explain the changes found.

Overall causes for Amnesia include neurological disorders, substance intoxication, head injury, brain tumours, or psychiatric disorders.[2] Besides COVID-19, the patient did not have another medical disease, there was no history of head injury, migraine, seizures nor consumption of psychotropic substances. There was no evidence of secondary gains so the diagnosis of Factitious Disorder was not placed.

The pattern of memory impairment was very peculiar, and not previously described, however, an identical case was portrayed in a well-known 2004 Hollywood film, "50 First Dates". Selective amnesia could not be explained by common forgetting. It caused significant suffering and functional impact manifested by anxiety and depressive humour. Also, the patient had a discrepancy between the memory deficit and the preservation of social skills. Social isolation due to COVID-19, as well as the fear associated with the disease, were situations experienced as traumatic by the patient, and it is known that psychogenic amnesia is associated with traumatic events.

Taking into account the symptoms and the absence of alterations in the exams performed, the patient meets the criteria for Dissociative Amnesia (DA), so this was the main diagnostic hypothesis. However, we cannot exclude the temporal relationship between amnesia and COVID-19, and maybe this virus could have a role in the onset of amnesia.

The patient underwent targeted therapy for comorbid anxious and depressive symptoms, namely sertraline 50mg/day, risperidone 1mg/day, and alprazolam 0.5mg/day. Concomitantly, he underwent psychotherapy. Progressively, the patient showed benefits from the established treatment plan.

At discharge, the patient showed significant improvement in symptoms, with only slight anxiety and memory complaints, but to a lesser extent and with less affective impact. The patient was instructed to maintain an ambulatory follow-up. At a six-month follow-up, he presented total remission of the symptoms and returned to his daily activity.

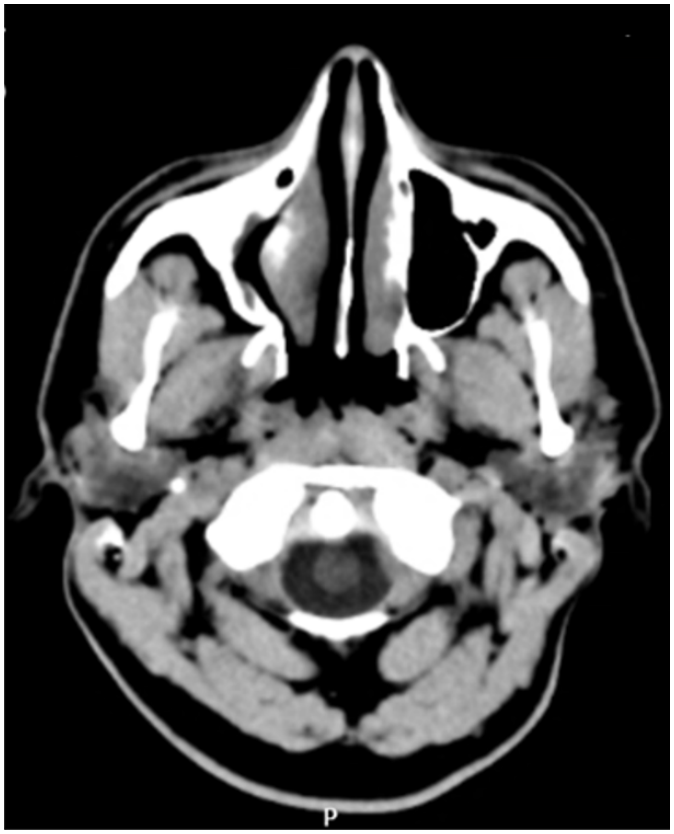

Figure 1 - Brain computed tomography demonstrated only right maxillary sinus inflammation. Absence of other changes with pathological significance.

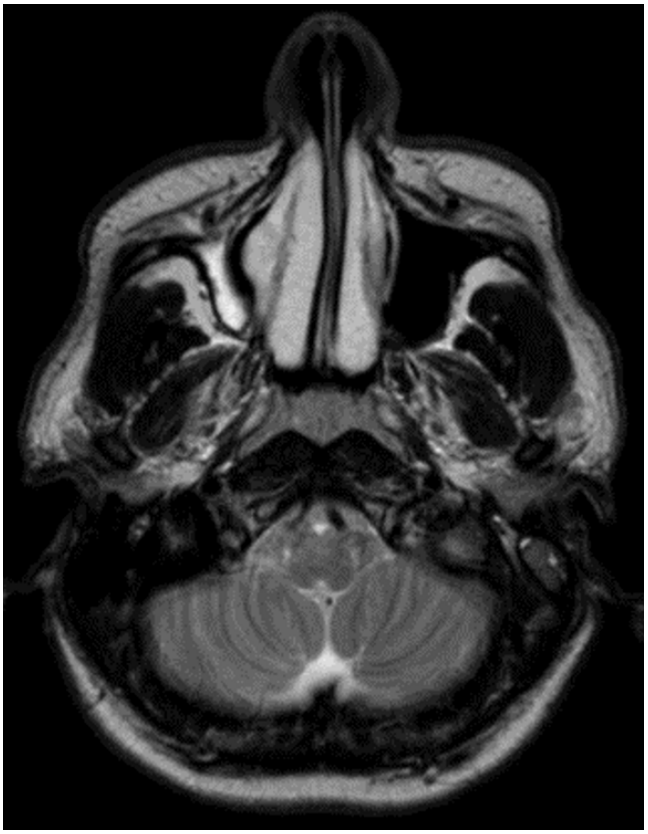

Figure 2 - Brain magnetic resonance imaging demonstrated right maxillary sinus inflammation. Absence of other changes with pathological significance.

DISCUSSION

Several authors point out that SARS-CoV-2 can affect the CNS, although the pathophysiological mechanism is not fully understood. It can affect directly the CNS, or indirectly through an immune response of the host.[4,5] The most commonly reported neurological symptoms are headache and dizziness, with neurological involvement occurring more frequently in the severe form of the infection.[4,5,8] Some psychiatric symptoms are also common in coronavirus infections. During previous coronavirus epidemics of SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome), it was shown that infected individuals commonly had symptoms of mental confusion (27.9%), depression (32.6%), memory impairment (34.1%) and insomnia (41.9%).[9] A recent meta-analysis (2020) revealed that, in the post-illness stage of coronavirus infections, the prevalence of Post-Traumatic Stress Disorder (PTSD) was 32.2%, Depression was 14.9% and Anxiety Disorders were 14,8%, which points to an important prevalence of psychiatric diseases and long-term effects on mental health.[8] However, it is still unclear whether the risk of presenting a psychiatric disorder is due to the viral infections themselves or the host's immune response.[5,8,10] In the United States, an association between COVID-19 and psychiatric disorders has been mentioned, with increased incidence of psychiatric diagnosis from the fourteenth to the ninetieth day after the diagnosis of COVID-19 in almost one fifth of individuals (the most frequent being anxiety disorders, insomnia, and persistent cognitive deficits).[11] Other studies show that a third of patients affected by SARS-Cov2 may experience post-COVID-19 sequelae.[12] Fatigue and cognitive impairment (the most frequent symptoms), along with other neuropsychiatric and physical manifestations, comprise post-acute sequelae of SARS-CoV-2 (i.e., symptoms persisting for at least four weeks after infection), colloquially referred to as "long COVID", whose pathophysiology is still unknown.[12]

As for memory disorders, these are very rare in patients with COVID-19. Some cases of TGA have been described in patients who had serious complications from the infection, namely stroke, and Takotsubo cardiomyopathy, with no cases of memory disorders being reported in patients with mild COVID-19.[6] It is interesting to note that some authors suggest that during the pandemic there was an increase in TGA cases in patients without SARS-CoV-2 infection, which was associated with the stress caused by the pandemic itself.[7] The impact of the current pandemic extends beyond direct infection with SARS-CoV-2. Other significant factors, such as mass quarantine, fear of illness, and social isolation, can also affect global mental health.[5,9]

Literature on the impact of previous pandemics or epidemics on the mental health of children and adolescents is particularly scarce. In a study with a sample of 8079 Chinese adolescents, a high prevalence of depressive symptoms (43%), anxious (37%), and combined symptoms of anxiety and depression (31%) were reported during the beginning of the COVID-19 pandemic period.[13] In Portugal, a study was published concerning a population of children followed up in a paediatric psychiatry consultation, in which it was found that the symptoms of sadness, irritability, anxiety, and behaviour worsened in one-third of the patients.[14] Therefore, the negative impact of COVID-19 on mental health is noteworthy, not only in adults but also in adolescents.

In conclusion, we may admitthat amnesia possibly has an aetiology of multifactorial origin. That being said, it may have been caused by the direct/indirect effects of the virus as well as the negative psychological impact associated with the COVID-19 pandemic. It should be noted that several published studies point to the existence of a relationship between COVID-19 and the occurrence of psychiatric disorders in adults and children.[8-11,13,14] Another aspect of SARS-CoV-2 infection, not yet fully understood, is the occurrence of long-term sequelae in different body systems.[5,8,12] It is even possible that the described memory disorder could be a post-covid-19 sequel, similar to the "long COVID" syndrome. No clinical case similar to this one has been reported to date, which leads us to question the role of SARS-CoV-2 infection regarding this psychiatric manifestation and mental illness in general. Therefore, further studies with long-term longitudinal follow-ups of patients recovered from SARS-CoV-2 infection are needed, to acquire greater knowledge about this disease and its evolution.

AUTHORSHIP

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Maria da Paz Saldanha Vieira – Supervision; Writing review & editing

Ana Célia Gonçalves – Resources; Writing review & editing

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