

## CASE REPORT / CAS CLINIQUES

**ONSET OF COGNITIVE DISORDERS FEW DAYS AFTER A COVID-19 INFECTION DISEASE: DIFFICULTIES TO SET A DIAGNOSIS IN MIDDLE AND LOW-INCOME COUNTRIES.**

***SURVENUE DE TROUBLES COGNITIFS POST INFECTION A COVID-19 : DIFFICULTES DIAGNOSTIQUES DANS LES PAYS A REVENU INTERMEDIAIRE ET FAIBLE.***

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## ABSTRACT

## Introduction

The coronavirus disease 2019 (COVID-19) was first known by its respiratory symptoms. Neurological complications are increasingly seen and described. Our case emphasizes the difficulties of differential diagnosis between encephalitis and post-traumatic stress disorder (PTSD) in SARS-COV2 patients.

## Case report

A healthy 62 years old man tested positive for COVID-19 during a travel procedure. He was admitted to hospital because of a sudden drop of oxygen saturation from 99% to 89% with pulmonary CT scan showing a parenchymal bilateral ground-glass lesions and consolidative opacities of about 50% of lung while the patient remained asymptomatic. After he has been discharged from hospital he developed isolated executive disorders. Post COVID-19 encephalitis or PTSD were questioning.

## Discussion and conclusion

Our patient had an acute hypoxemia which is well known to be associated with executive disorders such as in acute respiratory distress. But these signs appeared after the COVID-19 came negative hence the executive disorders were likely to be related to direct brain infection or to a non-infectious condition like the PTSD. Functional neuroimaging is then the gold standard to rule out a brain damage.

## RESUME

## Introduction

La maladie à coronavirus 2019 (COVID-19) a d'abord été connue par ses symptômes respiratoires. Les complications neurologiques sont de plus en plus décrites. Notre cas souligne les difficultés du diagnostic différentiel entre encéphalite et syndrome de stress post-traumatique (SSPT) chez les patients atteints de SARS-

COV2.

### Observation

Un homme de 62 ans en bonne santé a été testé positif au COVID-19 lors d'un voyage. Il a été admis à l'hôpital en raison d'une chute soudaine de la saturation en oxygène de 99% à 89%. La tomodensitométrie pulmonaire a montré des lésions parenchymateuses bilatérales en verre dépoli et des opacités consolidées sur environ 50% des poumons alors que le patient est resté asymptomatique. Après sa sortie de l'hôpital, il a développé des troubles exécutifs isolés. L'encéphalite post COVID-19 ou le SSPT ont été discutés.

### Discussion et conclusion

Notre patient a présenté une hypoxémie aiguë qui est bien connue pour être associée à des troubles exécutifs comme dans la détresse respiratoire aiguë. Mais ces signes sont apparus après que le COVID-19 se soit avéré négatif, donc les troubles exécutifs étaient probablement liés à une infection cérébrale directe ou à une condition non-infectieuse comme le SSPT. La neuro-imagerie fonctionnelle est alors l'examen-clé pour exclure une atteinte cérébrale.

## INTRODUCTION

The coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) was first known by its respiratory symptoms (7). Numerous scientific publications broadly described the lung disease at the beginning and most of them were from China. After the first observations, several authors started to report other complications, among which neurological complications are increasingly seen and described (1,3,5,6). Even though encephalitis is now well known to be linked with covid-19, isolated neurocognitive disorders are quite uncommon from the literature we went through (6). Our case emphasizes the difficulties of differential diagnosis between encephalitis and post-traumatic stress disorder (PTSD) in SARS-COV2 patients.

## CASE REPORT

A 62 years old man, resident in The Hague and on vacation in Dakar, was seen in a neurology consultation on February 1, 2021 for behavioral disorders. He is athletic, plays golf at an excellent amateur level, short-sighted and has no particular previous medical history. On January 19<sup>th</sup> 2021, he underwent a covid test at the Pasteur Institute in Dakar for his return trip as it is mandatory by the state authorities. The RT-PCR test came back positive. As the patient was not symptomatic, he was placed in home isolation with daily monitoring by his attending physician. Within 24 hours, his oxygen saturation (SaO<sub>2</sub>) measured with a finger oximeter dropped from 99% to 89% and the pulmonary CT scan made at this time showed a parenchymal bilateral ground-glass lesions and consolidative opacities of about 50% of lung surface confirming SARS-CoV-2 infection which led to his hospitalization on January 21<sup>st</sup>, 2021. He has been hospitalized 10 days in a unit dedicated to covid-positive patients meanwhile he stayed clinically asymptomatic. He received the therapeutic protocol in force in Senegal. He was discharged after two consecutive negative tests after 10 days of hospitalization and 12 days from his initial positive test. Once at home his wife noticed sudden behavioral impairments. She called the family doctor who requested a neurology consultation to rule out stroke.

At the examination, the patient was afebrile, eupneic, his blood pressure was 125/89mmHg, his SaO<sub>2</sub> was 99%, he had no lower limbs edema, no calf swelling suggestive of deep vein thrombosis.

On the neurological side, he was conscious, alert, well oriented in time and space and first answered questions clearly. However, after a couple of questioning, his speech and answers became less coherent. Language was fluent, sometimes logorrheic and sometimes logopenic. His head and gaze were always directed to his left side. The neurocognitive examination showed a dysexecutive syndrome, an ideomotor apraxia, a visuo-constructive apraxia, an asomatognosia, an autotopagnosia and a working memory disorder marked by a Dubois'-5-words test's score of 15/20.

The brain CT scan and MRI performed were both normal. That ruled out stroke and we retained either an encephalitis or a PTSD. We performed a CSF examination which came normal although the search for SARS-COV 2 in CSF was not done. We conclude that a neurocognitive rehabilitation would be beneficial.

The patient travelled back to France. We advised him to perform another MRI as well as to be followed-up by an occupational neurologist and a physiotherapist. The second MRI with all the appropriate sequences, FLAIR, Diffusion, ADC was done in Paris and came actually normal. He's undergoing cognitive-behavioral rehabilitation and occupational therapy and his cognitive state markedly improved.

## DISCUSSION

In our patient, the diagnosis was first encephalitis due to SARS-COV2 infection even if the MRI was normal. The normality of standard brain imaging such as MRI in encephalitis with COVID-19 was also seen by Grimaldi et al., (2). Our patient had an acute severe hypoxia with an O<sub>2</sub> saturation dropped from 99% to 89% in 24 hours. His neurocognitive signs are certainly secondary to the acute hypoxemia he experienced. In fact, such signs are well known to be present in patient with acute hypoxemia as in acute respiratory distress (4). On another hand, our patient may also suffer with PTSD for neurocognitive sign such as executive disorders are also present in patients with PTSD (4). The fact that he rapidly recovered from his troubles once in Europe could be a clue in favor of a PTSD. Since the neurocognitive signs appeared after the patient was declared healed, our case once again questions on the actual pathogenesis of COVID-19 encephalopathy (1). In addition, the absence of virus in CSF, the negativity of nasal swab test at the time of neurocognitive signs also questions on a potential long-lasting of SARS-COV 2 in brain parenchyma while the virus was no longer seen on the olfactory bulb.

## CONCLUSION

The report of neurological sign is increasing among COVID-19 patients. Of its, neurocognitive disorders are most of the time associated with stroke or encephalitis in ill patients. As in our case, when neurocognitive disorders appear in a patient healed, one must consider a potential encephalitis or a PTSD. Functional neuroimaging is then the gold standard to rule out a brain damage.

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