



Headache and pleocytosis in CSF associated with COVID-19: case report

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Abstract

In December 2019, a new coronavirus infection was identified in China. Although the clinical presentation of COVID-19 is predominantly respiratory, more than 35% of patients have neurological symptoms. We report an elderly female with asthenia, dry cough, anosmia, ageusia, fever, nausea, and a severe and persistent headache. She had confirmed COVID-19 using the nasal swab RT-PCR technique. Her cranial tomography was normal. The CSF analysis demonstrated a cell count of 21 cells/mm³ (80% lymphocytes and 20% monocytes), 34 mg/dl protein, and 79 mg/dl glucose. She improved after 4 days. Our report draws attention to the meningeal involvement of SARS-CoV-2.

Keywords COVID-19 · SARS-CoV-2 · Meningitis · Headache · Headache disorders, secondary

Introduction

In December 2019, a new coronavirus infection (COVID-19) was identified in China. Although the clinical presentation of COVID-19 is predominantly respiratory, more than 35% of patients have neurological symptoms [1].

We searched PubMed and SciELO (Scientific Electronic Library Online) for observational studies published between December 2019 and July 2020, with the search terms: COVID-19 OR SARS-CoV-2 AND meningitis. We did not find any case report about isolated viral meningitis associated with COVID-19.

We describe herein a case of a patient with isolated viral meningitis associated with COVID-19.

Case report

A 68-year-old female with systemic arterial hypertension presented with a dry cough, anosmia, and ageusia for 7 days. She

also had a fever in the first 7 days of symptoms. After an improvement in these symptoms, the patient began to present asthenia, nausea, and a severe headache.

This headache had a gradual onset, a severe intensity; was located in the left frontotemporal region; was described as a dull/stabbing pain; and was associated with nausea. There was no vomiting and no photophobia, phonophobia, or associated autonomic trigeminal symptoms. Her headache was continuous, with no remission periods, and lasted 8 days.

Her physical examination was normal, with a temperature of 36.7 °C, a respiratory rate of 18 incursions per minute, and 97% O₂ saturation in ambient air.

On neurological examination, she presented no change in the level or content of consciousness or meningeal signs or focal signs. In the laboratory exams on admission, she presented lymphopenia (540 lymphocytes/mm³), thrombocytopenia (117,000 platelets/mm³), and 7.61 C-reactive protein (normal up to 0.03 mg/dl).

On admission, due to the persistence of a severe headache and nausea, she underwent a non-contrast cranial tomography, which was normal, and a lumbar puncture. The CSF analysis demonstrated a cell count of 21 cells/mm³ (80% lymphocytes and 20% monocytes), 34 mg/dl protein, and 79 mg/dl glucose. The CSF opening pressure was 20 cmH₂O.

The result of the COVID-19 survey was positive, using the nasal swab RT-PCR technique. The CSF was not tested for the virus.

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The patient remained in the hospital for 4 days and was discharged after clinical improvement.

Discussion

Our patient had a fever, severe headache, nausea, and lymphocytic pleocytosis in the CSF. This clinical picture is compatible with viral meningitis. The CSF cellularity, although increased, had a relatively low value. This can be explained by the time this test was performed, after 12 days of symptoms.

The positivity of RT-PCR in the presence of symptoms reinforces the possibility that the cause of meningitis was SARS-CoV-2. However, we may not rule out the possibility of coinfection with other viruses. We encountered no description in the literature of viral meningitis associated with COVID-19.

Thus far, little is known on the neurological impairment caused by SARS-CoV-2. Recently, the description of cases of meningoencephalitis [2–4] and Guillain-Barré syndrome [5, 6] reinforced the possibility of affecting both the central nervous system and the peripheral nervous system in COVID-19.

Headache can be a major problem for patients with COVID-19 [7]. Mao et al. reported that 28 of 214 patients (13%) admitted to Chinese hospitals presented with headache [8]. As no CSF was performed, the possibility that this headache was caused by viral meningitis cannot be ruled out. Recently, two studies performed by neurologists found higher frequencies of headaches (27 and 45%) [9, 10].

Little is known about the pathophysiology of headache in patients with COVID-19. It is speculated that a direct lesion of the virus or the inflammatory process triggered by it may be involved [7]. Headache patients have a higher serum level of interleukin 6 than those without headaches [9].

Our report, therefore, draws attention to the meningeal involvement in the pathophysiology of headache and shows that even in a patient without meningeal signs but with persistent headache, the possibility of viral meningitis should be considered.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This case report was approved by the institution's ethics committee.

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