

# Clinical Correspondence

## Persistent Headache and Persistent Anosmia Associated With COVID-19

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Respiratory symptoms are the predominant symptoms in Coronavirus Disease 2019 (COVID-19). However, 6.5%-71% of patients with this disease have headaches (in most studies, between 11% and 14%).<sup>1</sup> Despite this, little is known about the characteristics of this headache, its repercussions, or its temporal evolution.<sup>1</sup>

We describe here a case of persistent headache associated with COVID-19.

A 40-year-old woman had a previous diagnosis of migraine with and without aura. Her previous headaches were located in the frontal, temporal, and parietal regions, were bilateral and pulsatile, of moderate intensity, associated with nausea, vomiting, photophobia, and phonophobia. She avoided exercising when she had a headache. The headache attack lasted

4 hours and was rarely preceded by vertigo that lasted 15 minutes. In the 30 days prior to COVID-19, she has had only 3 days with headache (headache diary).

The first symptom of COVID-19 she had was diarrhea. On the second day of symptoms, she had a non-productive cough, fatigue, and myalgia that lasted 5 days.

On the fourth day of illness, she had sudden anosmia, associated with facial pain in the bilateral malar region, described as a pressure, moderate-intensity pain, that worsens with physical activity, without photophobia, phonophobia, or nausea. The pain lasted 48 hours.

The result of the COVID-19 survey was positive, using the nasal swab reverse transcription polymerase chain reaction (RT-PCR) technique. Troponin, C-reactive protein, blood count, ferritin, Alanine Aminotransferase, and Aspartate Aminotransferase were normal. The D-dimer was 590 ng/L [0-500 ng/L].

From the fifth day of illness on, she had a bilateral, frontotemporal, pulsating quality headache, that worsened with mild physical activity, and was associated with photo and phonophobia. During the 12 days that she had symptoms other than headache, she had had headaches for 7 days. During those 7 days, the pain was continuous and severe. After improvement of the

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other symptoms, there was a worsening in the intensity of the headache.

The frequency of headache attacks in the 2 months after the symptomatic phase of COVID-19, recorded in a headache diary, was: week 1: 5 days; week 2: 6; week 3: 6; week 4: 4; week 5: 4; week 6: 4; week 7: 3; and week 8: 3 days out of 7.

The patient has been using naproxen and sumatriptan for the treatment of headache attacks with pain relief. She never experienced a fever or headache triggered by a cough from the onset of the disease. She had no meningeal signs. She also never had aura.

There has been an improvement in the frequency, intensity, and duration of her headache over time. Currently, the patient has a 80-day history of this headache. The current headache is moderate to severe and lasts 6 hours. As her headache attacks were improving, she decided not to start prophylactic treatment for headaches and not to perform a lumbar puncture.

Magnetic resonance imaging (T1, T2, and fluid-attenuated inversion recovery) and intracranial magnetic resonance angiography (arterial and venous) were normal. There was no contrast enhancement in the meninges or parenchyma or restricted diffusion.

Although her headaches associated with COVID-19 also had migraine characteristics, our patient considered these headaches to be different from the previous ones. She considered that her headache was the most disturbing symptom she had had during the illness. Eighty-five days after the start of COVID-19, the patient remains with anosmia and with headaches.

Our patient presented anosmia concurred with facial pain, which lasted 48 hours. As far as we know, there are no reports of similar cases in the literature.

Brain magnetic resonance studies have shown changes in olfaction-related structures in patients with COVID-19. Recently, a patient with anosmia, dysgeusia, with a cortical hyperintensity in the right gyrus rectus and a subtle hyperintensity in the olfactory bulbs, compatible with viral brain invasion was reported.<sup>2</sup> Another study, using a specific technique for processing magnetic resonance imaging, described 5 cases of COVID-19 (3 with anosmia) that presented changes in olfactory bulb suggestive of microbleeding or abnormal enhancement on MR imaging. Four of these patients underwent this examination because of headaches.<sup>3</sup>

SARS-CoV-2 probably enters the central nervous system via the olfactory pathway. Our patient had sudden anosmia, facial pain, and persistent headache that had a close onset time. Although brain magnetic resonance imaging was normal, it was performed 23 days after anosmia and may not have been able to detect an anatomical lesion. The persistence of anosmia reinforces the possibility of an injury to the olfactory pathway.

Her headache that occurred during the symptomatic phase of COVID-19 can be classified as “headache attributed to systemic viral infection.”<sup>4</sup> However, we cannot rule out that our patient has already had viral meningitis as she did not perform a lumbar puncture. The absence of fever and meningeal signs speak against this possibility.

We cannot rule out also that she could have experienced a worsening of her previous headache, since the characteristics of the “new headache” are similar to the previous one, despite the increase in frequency and intensity. Stress is a known trigger of migraine attacks and may have contributed to this worsening. Viral diseases can also worsen primary headaches.<sup>5</sup>

Although our patient has been using pain medications frequently, the diagnosis of medication-overuse headache is unlikely. Her headache behavior is the opposite of what we would expect for medication-overuse headache. There was no progressive worsening of her headaches as the painkiller’s medications were used.<sup>4</sup> The patient’s headache had already started as a continuous headache. This is the cause of the frequent use of pain medications. Despite this use, her headaches improved over time.

New daily persistent headache (NDPH) is another chronic headache that can be triggered by viral diseases. As with our patient, the patients with NDPH can distinct and clearly remember the onset of their headaches, which become continuous and unremitting within 24 hours. However, as our patient does not have a 3-month history of frequent headaches, yet, we can classify your headache as Probable NDPH.<sup>4</sup>

Most cases of COVID-19, like our patient, are mild cases, which do not require hospitalization. This case draws attention to the importance that headaches may have for these patients.

**REFERENCES**

1. Bolay H, Gül A, Baykan B. COVID-19 is a real headache! *Headache*. 2020;60:1415-1421.
2. Politi LS, Salsano E, Grimaldi M. Magnetic resonance imaging alteration of the brain in a patient with coronavirus disease 2019 (COVID-19) and anosmia. *JAMA Neurol*. 2020. doi: 10.1001/jamaneurol.2020.2125.
3. Viana Vasco Aragão MF, de Carvalho Leal M, Queiroga Cartaxo Filho O, Moreira Fonseca T, Moraes Valença M. Anosmia in COVID-19 associated with injury to the olfactory bulbs evident on MRI. *Am J Neuroradiol*. 2020;41. doi: 10.3174/ajnr.A6675.
4. Headache Classification Committee of the International Headache Society. The International Classification of Headache Disorders, 3rd edition. *Cephalalgia*. 2018;38:1-211.
5. Sampaio Rocha-Filho PA, Torres RCS, Ramos MU. HIV and headache: A cross-sectional study. *Headache*. 2017;57:1545-1550.