

BRIEF COMMUNICATIONS

Trigeminal neuralgia as the sole neurological manifestation of COVID-19: A case report

Javier Molina-Gil MD  | Lucía González-Fernández MD | Carmen García-Cabo MSc, PhD

Department of Neurology, Hospital Universitario Central de Asturias, Oviedo, Spain

Correspondence

Javier Molina Gil, Department of Neurology, Hospital Universitario Central de Asturias, Avda. Roma, s/n, Oviedo 33011, Spain.
Email: javimol1993@hotmail.com

Abstract

Objective: To describe a case report of trigeminal neuralgia (TN) due to coronavirus disease-2019 (COVID-19).

Background: In March 2020, the World Health Organization declared COVID-19 as a pandemic. Respiratory system manifestations are dominant in this new disease. However, numerous case series and reviews have been published on the neurological manifestations, highlighting the potential neurotropism of the new coronavirus.

Methods: We describe a clinical case of TN during COVID-19 and we discuss the differential diagnosis and the potential pathogenic mechanism according to the literature.

Results: A 65-year-old man with general malaise and typical respiratory symptoms of COVID-19, who presented with paroxysmal lancinating pain in the right V1 trigeminal territory without other neurological symptoms. General blood test and neuroimaging study were normal. A rapid test showed positive IgG and IgM serologies for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The patient was diagnosed with TN secondary to a viral infection by SARS-CoV-2. Facial pain resolved with the improvement of COVID-19.

Conclusions: The new coronavirus SARS-CoV-2 is a possible etiology of secondary TN. Nevertheless, more studies are needed to elucidate the neuropathology of this viral infection.

KEYWORDS

coronavirus disease-2019, headache, neurological symptoms, severe acute respiratory syndrome coronavirus 2, trigeminal neuralgia

INTRODUCTION

In December 2019, the first cases of atypical pneumonia caused by a new pathogen, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), were detected in Wuhan, China. In March 2020, the World Health Organization declared coronavirus disease-2019 (COVID-19) as a pandemic.^{1,2}

Manifestations within the respiratory system are dominant in COVID-19. However, other manifestations such as headache,

abdominal pain, diarrhea, and loss of taste and smell have been added to the clinical spectrum during the course of the disease,^{1,2} and numerous case series and reviews have been published on the neurological manifestations, highlighting the potential neurotropism of the new coronavirus.³⁻⁵

Approximately 40% of patients with COVID-19 have presented with neurological symptoms.^{3,4} Headache was reported in 11%–34% of the hospitalized patients, but few studies have carried out a characterization of pain.⁵

An observational Spanish study described 112 health professionals who suffered headache during COVID-19. The authors found that headache appeared on the fourth day from the beginning of

Abbreviations: COVID-19, coronavirus disease-2019; MR, magnetic resonance; TN, trigeminal neuralgia; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

the infectious symptoms and it was not related to fever. Hemifacial involvement was predominant and patients described a worsening of the pain with head movements and exercise. Two patients in the sample experienced pain resembling electric shock, without following a certain nerve territory.

The existence of TN in relation to SARS-CoV-2 infection was not identified.⁶

Mao et al. registered five cases of nerve pain in their series of neurological manifestations of COVID-19, without specifying the nerve territory compromised or the pain characteristics.³

CLINICAL CASE

We present the case of a 65-year-old man, with no medical history, who began with general malaise, arthromyalgia, dry cough, and low-grade fever.

On the third day, he noted paroxysmal lancinating pain in the right V1 region that lasted a few seconds and was triggered by a light touch of the skin at a specific point on the scalp. The patient did not mention other neurological symptoms such as anosmia or ageusia. On physical examination, there were no vesicular skin lesions or sensory loss in that location, and no associated autonomic symptoms.

Three days after the onset of pain, the patient developed a fever of 38.5°C and experienced a clinical worsening of the pain. He consulted his general practitioner, who prescribed pregabalin 300 mg and diazepam 10 mg per day for the pain, and recommended home quarantine due to a high suspicion of COVID-19. The patient did not respond to pharmacological treatment and decided to abandon it after a few days. However, the pain resolved with the improvement of COVID-19-specific symptoms.

To carry out a complete etiological study, a cranial magnetic resonance (MR) with MR angiography was performed and it was normal with no evidence of vascular contact with TN. Blood tests, which included blood count, infectious serologies, and renal, liver and thyroid function, were normal.

Although PCR test was negative, rapid test showed positive IgM and IgG serologies for SARS-CoV-2, and an initial analysis showed a slight elevation of the D-dimer of 800 ng/ml (upper limit: 500 ng/ml). Due to these results, the patient was diagnosed with TN secondary to a viral infection by SARS-CoV-2.

We obtained the written informed consent of the patient and ethical board approval to communicate this clinical case.

DISCUSSION

TN is defined as unilateral and lancinating facial pain with an abrupt onset and termination. It could be triggered by innocuous stimuli and its distribution is restricted to one or more trigeminal subdivisions. TN can develop for no apparent reason or be caused by another diagnosed disorder. Its prevalence is estimated to be in 0.07% and it

is more frequent in women over 50 years of age. Right hemifacial involvement predominates in this type of neuralgia and V1 involvement is uncommon.^{7,8}

In the differential diagnosis of TN, it is worth highlighting trigeminal neuropathy, which is usually accompanied by sensory loss and a longer duration of pain,⁹ and trigeminal autonomic cephalalgias such as SUNCT (short-lasting unilateral neuralgiform headache attacks with conjunctival injection and tearing) and SUNA (short-lasting unilateral neuralgiform headache attacks with cranial autonomic symptoms), whose main characteristics are being accompanied by autonomic symptoms.¹⁰ The patient described here, did not present the characteristic symptoms of these headaches in any case.

Regarding its etiology, half of patients with TN have the idiopathic subtype while classical TN is due to a neurovascular compression of the trigeminal root that was not found in our patient. Alternatively, secondary TN can be due to multiple sclerosis, cerebellopontine angle tumors, and other pathologies.⁷

Some authors suggest a direct mechanism of headache and facial pain generation associated with COVID-19 in which the virus invades and disseminates to the CNS retrogradely through the binding of SARS-CoV2 to the surface receptors of the angiotensin converting enzyme type 2 that are present in the trigeminal nerve terminals of the nasal cavity.¹¹ Other authors hypothesize an indirect activation of the trigeminal-vascular system in relation to a cytokine storm, and the subsequent increase in systemic inflammatory markers like calcitonin gene-related peptide.¹² However, more studies are required to clarify controversial aspects of the pathophysiology of this unknown disease.

After reviewing the literature, the authors have not identified previous descriptions of TN as the sole neurological manifestation of the SARS-CoV-2 viral infection.

LIMITATIONS

The case presented has its limitations. Despite being an accurate description of TN, the mechanisms by which the SARS-CoV-2 activates the nerve and causes it to trigger pain are not yet clear. More studies are needed to elucidate the neurological manifestation of the SARS-CoV-2 infection.

CONFLICT OF INTEREST

The authors of this manuscript declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Conception and design: Javier Molina-Gil. *Acquisition of data:* Lucía González-Fernández. *Analysis and interpretation of data:* Javier Molina-Gil, Lucía González-Fernández. *Drafting the manuscript:* Javier Molina-Gil, Carmen García-Cabo. *Revising it for intellectual content:* Carmen García-Cabo. *Final approval of the completed manuscript:* Javier Molina-Gil, Lucía González-Fernández, Carmen García-Cabo.

ETHICS

Institutional review board approval: Hospital Universitario Central de Asturias.

ORCID

Javier Molina-Gil  <https://orcid.org/0000-0002-8428-1457>

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