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CASE REPORT

Early vertigo in a patient with oligosymptomatic and prolonged COVID-19: a case report

Vertigem inicial em paciente com COVID-19 oligossintomática e prolongada: relato de caso

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ABSTRACT

Emerging infectious disease COVID-19 is caused by the new coronavirus SARS-CoV-2 and it has been described as potentially multisystemic. Despite its predominantly respiratory syndromic presentation, a series of extra-pulmonary manifestations, including neurological ones, have been documented. This report refers to a 61-year-old male patient assisted in ambulatory regime for control of chronic comorbidities. This patient presented complaints of nasal congestion, vertigo and had positive RT-PCR for SARS-CoV-2 at the initial evaluation, remaining positive 21 days after symptoms onset. There were no aggravation signs during the course of the disease and complete resolution of symptoms occurred approximately two months after initial clinical presentation.

Keywords: COVID-19; Vertigo; Neurological Manifestations.

RESUMO

A doença infecciosa emergente COVID-19, causada pelo novo coronavírus SARS-CoV-2, tem sido descrita como potencialmente multissistêmica. Apesar de sua apresentação sindrômica predominantemente respiratória, uma série de manifestações extrapulmonares, incluindo neurológicas, têm sido documentadas. Este relato se refere a um homem de 61 anos, atendido em regime ambulatorial para controle de comorbidades crônicas, com queixas de congestão nasal, vertigem e com PCR SARS-CoV-2 positivo à avaliação inicial e por até 21 dias após início dos sintomas. Não houve sinais de gravidade durante o curso de doença e a resolução completa dos sintomas ocorreu em aproximadamente dois meses após apresentação clínica inicial.

Palavras-chave: COVID-19; Vertigem; Manifestações Neurológicas.

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Introduction

The novel coronavirus, denominated severe acute respiratory syndrome – coronavirus 2 (SARS-CoV-2), that causes COVID-19, is a single-stranded RNA virus considerably potential for rapid global spread, being associated with high morbidity and mortality rates[1]. This virus' infectivity is related to the presence of the structural protein S (Spike), which binds itself to receptors of the angiotensin 2 converting enzyme (ACE-2), which is relevant to cellular tropism[2]. ACE-2 expression occurs in several cell types, including lungs, kidneys, intestine and brain, which implies several clinical presentation possibilities. Therefore, this infection is not restricted only to the respiratory system and, being multisystemic, it may also compromise both central nervous system (CNS) and peripheral nervous system (PNS)[2]. The spectrum of clinical presentation is broad, and the neurological manifestations of COVID-19 have a complex and diverse syndromic presentation. They may occur regardless of the respiratory system and, sometimes, as an unspecific initial clinical presentation[3]. Symptoms indicates variable severity expressions which include not only headache, dizziness, vertigo and paresthesia, but also forms of complex diseases, such as convulsion, meningoencephalitis, Guillain-Barré syndrome and acute cerebrovascular complications[2]. In this report, we present an atypical clinical course of a patient with unspecific initial clinical presentation, suspected neurological compromise and prolonged evolution, with persistent symptomatology and persistent positive reverse transcription polymerase chain reaction (RT-PCR).

Case Report

This case report concerns a 61-year-old Brazilian male patient who presented himself to elective ambulatory service in a private health clinic, in a city in Minas Gerais, on June 6th, 2020, for chronic comorbidities' control. Patient complained about nasal congestion for a week and, at the onset of symptoms, he experienced slight loss of balance for a day, which could be observed with abrupt change in head's position (when quickly standing up, lying down and during rotational movement). Vertigo was mild, transient and sporadic. Patient denied syncope, fever or other systemic or respiratory symptoms, such as odynophagia and cough. In addition, there were no symptoms of nausea or vomiting, headache, tinnitus, hypoacusis or other vestibular disfunction symptoms.

Patient's medical history includes Type I Diabetes Mellitus (DM) and Systemic Arterial Hypertension (SAH), with no previous history of specific comorbidities or previous vertigo events. At that time, patient was using these medications: insulin degludec 52 UI/day, insulin aspart 42 UI/day, losartan 50 mg/day, rosuvastatin 10 mg/day and acetylsalicylic acid 100 mg/day. The initial clinical exam did not show signs of relevant abnormalities, nor was there the presence of tachycardia, fever, signs of respiratory discomfort or tachypnea, and his blood pressure was 120/70 mmHg. There was no gait or postural instability.

A diagnostic hypothesis of acute rhinosinusitis, with probable viral etiology, was raised. RT-PCR for SARS-CoV-2 was collected seven days after symptoms onset with positive result. Subsequent appointments all occurred remotely by teleconsultation, considering not only the peculiarities of the case that allowed this type of follow-up, but also the absence of severity signs. During the entire follow-up period, patient denied the emergence of significant new symptoms. Orthostatic hypotension was investigated but not detected.

Clinical course was markedly characterized by prolonged symptoms. Nasal congestion persisted for 24 days after symptoms' onset, but patient showed quick improvement after nasal budesonide introduction. Vertigo episodes relapsed, and condition progressed stably in relation to the initial evaluation, with brief and nonsustained periods of improvement as well as symptom-free days.

Complementary propaedeutics, performed 28 days after symptoms' onset, demonstrated that liver and kidney function tests, complete blood count, possible severity markers (LDH, CK), hepatitis serologies and other sexually transmitted diseases (anti-HIV, anti-HTLV I/II and VDRL) were all at normal standards. Search for COVID-19 antibodies, IgA and IgG, was negative and RT-PCR SARS-CoV-2 was still positive after 21 days of symptoms' onset, being no longer detected on the 34th day.

Patient was prescribed first dimenhydrinate and then betahistine for symptomatic treatment, both leading to partial improvement. Due to the long clinical condition, patient was referred for Otorhinolaryngology evaluation 39 days after symptoms' onset, being diagnosed with benign paroxysmal positional vertigo (BPPV), which was supported by positive Dix-Hallpike maneuver on electronystagmography. Audiometry was considered normal. Cinnarizine 45 mg three times daily and nasal triamcinolone acetonide were prescribed, achieving symptom remission after three weeks. Patient chose not to undergo vestibular rehabilitation due to clinical improvement after using the prescribed medication.

Discussion

Despite the predominance of respiratory compromise state, neurological symptoms may affect up to 30% of COVID-19 patients[4]. According to Mao *et al.*, 36.4% of hospitalized patients may present related abnormalities[5,6]. SARS-CoV-2 neurotropism is possibly heterogeneous and multifactorial. Direct cerebral involvement, autoimmune and inflammatory factors ("cytokine storm"), side effects to medications, metabolic disorders and critical illness neuropathy are possible mechanisms described[5] and related to this virus' neurotropic characteristics.

Neurological complications usually occur early on in COVID-19, they are more common in severe diseases, and they may be isolated clinical presentations in some patients without other typical symptoms of COVID-19[3,4,6,7]. Vertigo has been described as one of the possible neurological manifestations[6]. In Viola *et al.*, 18.4% of participants reported balance disorder after diagnosis of infection by SARS-CoV-2. Among them, 94.1% complained about nonspecific dizziness. Acute vertigo attacks were reported in 5.9% of the cases[8]. Korkmaz *et al.* verified vertigo in 6.1% of the cases and dizziness in 31.8%[9].

Picciotti *et al.* described eight patients with COVID-19 and vertigo, with vestibular findings suggesting BPPV, which is the main cause of vestibular peripheral vertigo. In terms of severity, three of these patients had a mild medical condition and five of them were hospitalized, demanding intensive care[10]. Table 1 presents a summary of previous literature descriptions of vertigo associated with SARS-CoV-2 infection.

Table 1. Summary of characteristics and main clinical reports of patients with COVID-19 and vertigo.

Author	Country	Study design	Sex/Age	Vestibular symptoms	Investigations	Diagnosis/Treatments/Outcomes
Malayala et al.[12,17]	Iran USA Caucasus Brazil	Case series	1. F/31 2. F/29 3. F/63 4. F/71	Vertigo Vertigo Vertigo Vertigo + tinnitus	1. MRI/audiometry (normal). Ny not described. 2. Brain TC/MRI (normal). Ny not described. 3. Ny to the right. 4. Ny not described.	1. Covid induced neuritis. Prednisone. Recovered. 2. Covid induced neuritis. Meclizine; IV steroid. Long lasting symptoms. 3. Post-viral vestibular neuritis. Prednisone. 4. No additional details provided.
Chern et al.[14,17]	USA	Case report	F/18	Vertigo + tinnitus + bilateral SNHL	Audiometry: SNHL. Tympanometry (normal). MRI	Bilateral intralabyrinthine hemorrhage. Prednisone and intratympanic injections of steroids.
Aasfara et al.[15,17]	Marocco	Case report	F/36	Vertigem + tinnitus + PANS	Spontaneous III grade Ny - > left. Audiogram: severe right SNHL. Videonystagmography: right vestibular areflexia on caloric examination. Brain and spinal cord MRI normal. LP: raised protein levels. Peripheral muscles EMG: demyelinating pattern of Guillain-Barré syndrome.	Right vestibulocochlear neuritis. Other symptoms: bilateral facial weakness and paraesthesia. Intravenous immunoglobulins and intravenous steroids. Recovery.
Mat et al.[11,17]	Belgium	Case report	F/13	Vertigo	Right spontaneous grade III Ny. vHIT: decrease of the vestibulo-ocular reflex gain and catch-up saccades for the left anterior and lateral semi-circular canals. MRI (normal). Audiometry (normal).	Vestibular neuritis. Vestibular rehabilitation.
Karimi-Galougahi M. et al.[7,17]	Iran	Case series	F/23	Vertigo + tinnitus + SNHL	Audiometry: SNHL	No additional details provided.

Caption: SNHL: sensorineural hearing loss; MRI: magnetic resonance imaging; Ny: nystagmus; EMG: electromyography; vHIT: video head impulse test. LP: lumbar puncture.

An important concern in the scenario of acute vertigo is the diagnosis of exclusion of vascular events of the CNS affecting the brainstem and/or cerebellum, being essential to confirm the peripheral origin of vertigo[11,12]. It's important to collect detailed data from patient's history, including symptoms and neurological signs (dysarthria, dysphagia, weakness, sensory loss or facial asymmetry), and proceed to clinical and neurological examination (Dix-Hallpike maneuver, vestibulo-ocular reflex and HINT tests) in an effort to guide differential diagnosis between causes of peripheral and central vertigo. This may also determine the need for neuroimaging[13].

In this reported case, broad evaluation was limited due to factors such as the improvement of patient's reported complaints at initial evaluation, the follow-up by teleconsultation, the pandemic scenario – which was still in its beginning with no vaccines available –, and also periods of improvement of the symptomatology with some clinical stability. Nevertheless, this case exposes singularities such as: atypical clinical presentation with early vertigo and suspected neurological compromise, associated with a mild and oligosymptomatic respiratory disease pattern with extended evolution. These circumstances led to questioning about differential diagnosis, immunity and safe period for discontinuing social isolation. Keeping a careful eye on the singularities of symptomatic complex manifestations of COVID-19 is important for opportune diagnosis, prevention measures, clinical-epidemiological surveillance and infection control.

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References

1. Luo Y, Wu J, Lu J, Xu X, Long W, Yan G, et al. Investigation of COVID-19-related symptoms based on factor analysis. Ann Palliat Med. 2020 Jul;9(4):1851-8. DOI: https://doi.org/10.21037/apm-20-1113

2. Chen X, Laurent S, Onur OA, Kleinberg NN, Fink GR, Schweitzer F, et al. A systematic review of neurological symptoms and complications of COVID-19. J Neurol. 2020 Jul;268:392-402. DOI: https://doi.org/10.1007/s00415-020-10067-3

3. Payus AO, Lin CLS, Noh MM, Jeffree MS, Ali RA. SARS-CoV-2 infection of the nervous system: a review of the literature on neurological involvement in novel coronavirus disease-(COVID-19). Bosn J Basic Med Sci. 2020;20(3):283-92. DOI: https://doi.org/10.17305/bjbms.2020.4860

4. Ahmad I, Rathore FA. Neurological manifestations and complications of COVID-19: a literature review. J Clin Neurosci. 2020 Jul;77:8-12. DOI: https://doi.org/10.1016/j.jocn.2020.05.017

5. Munhoz RP, Pedroso JL, Nascimento FA, Almeida SM, Barsottini OGP, Cardoso FEC, et al. Neurological complications in patients with SARS-CoV-2 infection: a systematic review. Arq Neuropsiquiatr. 2020 May;78(5):290-300. DOI: https://doi.org/10.1590/0004-282x20200051

6. Mao L, Jin H, Wang M, Hu Y, Chen S, He Q, et al. Neurologic manifestations of hospitalized patients with coronavirus disease 2019 in Wuhan, China. JAMA Neurol. 2020 Apr;77(6):683-90. DOI: https://doi.org/10.1001/jamaneurol.2020.1127

7. Karimi-Galougahi M, Naeini AS, Raad N, Mikaniki N, Ghorbani J. Vertigo and hearing loss during the COVID-19 pandemic - is there an association? Acta Otorhinolaryngol Ital. 2020 Jun;40(6):463-5. DOI: https://doi.org/10.14639/0392-100X-N0820

8. Viola P, Ralli M, Pisani D, Malanga D, Sculco D, Messina L, et al. Tinnitus and equilibrium disorders in COVID-19 patients: preliminary results. Eur Arch Otorhinolaryngol. 2021 Oct;278(10):3725-30. DOI: https://doi.org/10.1007/s00405-020-06440-7

9. Korkmaz MO, Eğilmez OK, Özçelik MA, Güven M. Otolaryngological manifestations of hospitalized patients with confirmed COVID-19 infection. Eur Arch Otorhinolaryngol. 2021 May;278(5):1675-85. DOI: https://doi.org/10.1007/s00405-020-06396-8

10. Picciotti PM, Passali GC, Sergi B, Corso E. Benign paroxysmal positional vertigo (BPPV) in COVID-19. Audiol Res. 2021 Aug;11(3):418-22. DOI: https://doi.org/10.3390/audiolres11030039

11. Mat Q, Noël A, Loiselet L, Tainmont S, Chiesa-Estomba CM, Lechien JR, et al. Vestibular neuritis as clinical presentation of COVID-19. Ear Nose Throat J. 2021 Feb 11; [Epub ahead of print]. DOI: https://doi.org/10.1177/0145561321995021

12. Malayala SV, Raza A. A case of COVID-19-induced vestibular neuritis. Cureus. 2020 Jun;12(6):e8918. DOI: https://doi.org/10.7759/cureus.8918

13. Lui F, Foris LA, Willner K, Tadi P. Central vertigo. Treasure Island (FL): StatPearls Publishing; 2021.

14. Chern A, Famuyide AO, Moonis G, Lalwani AK. Bilateral sudden sensorineural hearing loss and intralabyrinthine hemorrhage in a patient with COVID-19. Otol Neurotol. 2021 Jan;42(1):e10-e4.

15. Aasfara J, Hajjij A, Bensouda H, Ouhabi H, Benariba F. A unique association of bifacial weakness, paresthesia and vestibulocochlear neuritis as post-COVID-19 manifestation in pregnant women: a case report. Pan Afr Med J. 2021 Jan;38:30.

16. Chirakkal P, Al Hail AN, Zada N, Vijayakumar DS. COVID-19 and tinnitus. Ear Nose Throat J. 2021 Apr;100(Suppl 2):160S-2S.

17. Fancello V, Hatzopoulos S, Corazzi V, Bianchini C, Skarżyńska MB, Pelucchi S, et al. SARS-CoV-2 (COVID-19) and audio-vestibular disorders. Int J Immunopathol Pharmacol. 2021 Jan;35:1-8.DOI:https://doi.org/10.1177/20587384211027373