EDITORIAL

Post–COVID-19 neurological symptoms
Síntomas neurológicos post-COVID-19

It was somewhat to be expected that COVID-19 would lead to several neurological manifestations during the primary infection, as well as subsequent persistent symptoms. The Manual COVID-19 para el neurólogo general (COVID-19 handbook for general neurologists), published by the Spanish Society of Neurology on 20 April 2020, included a chapter analysing the neurological manifestations reported during the Middle East respiratory syndrome (MERS) outbreak of 2012 and the severe acute respiratory syndrome (SARS) outbreak of 2002, also caused by coronaviruses. It was unsurprising that patients with COVID-19 may present such neurological symptoms and syndromes as headache, myalgia, confusion, and various types of neuropathies at onset or during the acute phase. However, the high frequency and specificity of anosmia as an early symptom and the association with thrombotic events and severe encephalopathies in more torpid forms of the disease was unexpected.

The main evidence presaging the persistent symptoms of COVID-19 was a 2011 publication describing a series of 22 patients from Toronto, 21 of whom were healthcare workers, who developed chronic and disabling symptoms as headache, myalgia, confusion, and various types of neuropathies at onset or during the acute phase. However, the frequency and specificity of anosmia as an early symptom and the association with thrombotic events and severe encephalopathies in more torpid forms of the disease was unexpected.

The more canonical and recent designation “post–acute COVID-19 syndrome” (PACS) is more appropriate and has less negative connotations, though it is still not perfect. For these reasons, in this special issue of Neurology Perspectives, we have preferentially used the term “post–COVID-19 symptoms,” as the heterogeneity of the neurological symptoms described and the potential mechanisms of the disease, which are largely unknown, make their classification as a syndrome seem somewhat forced. We believe that this classification is more realistic and sincere, and leaves almost no connotations open to interpretation.

Early publications and attempts at classification were very praiseworthy, but probably insufficiently reflexive. The first definitions of the condition were something of a catch-all: from severe neurological sequelae due to prolonged ICU stays to syndromes resembling fibromyalgia that emerge following an asymptomatic period after the infection, including the subjective sensation of dyspnoea, dizziness, inattention, or anosmia after mild COVID-19. This broad, nonspecific umbrella term even came to include at times such entities as persistently positive PCR results after the primary infection, reinfection with a new or the same variant, infection or reinfection after vaccination, and the potential neurological complications.

Many scientific papers, most published open-access both for physicians and for patients, were immediately echoed in the press and social media, which have been the main sources of information, disinformation, and consolation since March 2020. One issue considered by many to be a glaring mistake, and which still creates uncertainty and damages health, is the definition of these post–COVID-19 conditions. We needed a name or a label to refer to an entity that was as yet undefined and of unknown cause. In this case, the “art of naming things,” so frequently used in medicine, was conspicuous by its absence. It was no sooner said than done: the terms chronic COVID syndrome, persistent COVID-19, or long COVID saw immediate, global success, but such designations represented a series of semantic catastrophes of inestimable iatrogenic import, as they suggest that COVID-19, or worse, SARS-CoV-2, may remain in the body for weeks or months, which is not true.

This clinical heterogeneity of post–COVID-19 neurological symptoms becomes apparent when we observe the spectrum of possible scenarios, which are not mutually exclusive: sequelae of prolonged hospitalisation or ICU stays, such as critical illness neuromyopathy; sequelae of neurological complications in the acute phase of the disease, ranging from long-term anosmia to the sequelae of large-vessel stroke; immune-mediated neurological conditions, such as...
García-Moncó JC. Cuadros clínicos neurológicos asociados a la infección por SARS-CoV-2. 

Neither do we address in detail the functional character of some of these symptoms, for which a growing body of literature is available. In this sense, some authors have suggested that less specific post–COVID-19 symptoms, classified as chronic COVID syndrome, persistent COVID-19, or long COVID, may represent the first condition defined by patients, who, unable to be attended by physicians who were unfamiliar with or dismissed the symptoms, saw their experiences reflected in social media posts by other people. 

This possibility, far from justifying the symptoms, may change the rules in future.

The majority of patients, even those who are more exposed and more vulnerable to the above-mentioned psychosocial pressure, will improve sooner or later, whether in the hands of experts or without assistance. Life goes on, and pandemics end.

This variety of manifestations constituted a challenge when defining the focus of this special issue, as several different approaches could have been taken. Therefore, after an introduction addressing the epidemiology, pathophysiology, and classification of the condition, we opted to present it according to the main neurological symptom groups by intensity, disability, or frequency: cognitive symptoms, symptoms of possible peripheral nervous and neuromuscular origin, and persistent headache after COVID-19. We do not address sleep disorders or psychopathological and psychiatric symptoms, among others, which are frequently associated with the above-mentioned signs.

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The articles in this issue were drafted between July and October 2021. Being aware that these symptoms are still in process of being defined, "symptoms in the mist" if we may permit ourselves the expression, we deemed it appropriate, and above all necessary, to publish this special issue on the main post–COVID-19 neurological symptoms. Considering the limited references in the literature, and aware that we will soon have answers from relevant studies that have already been published or are underway, we asked all the authors to make an effort to review, organise, clarify, and even forecast groups of symptoms. All of those involved, both authors and editors, are aware of the ephemeral value of this collective task, but establishing some degree of order amongst this chaos is well worth the time and dedication.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at [https://doi.org/10.1016/j.neurop.2021.11.001](https://doi.org/10.1016/j.neurop.2021.11.001).

### References


