



POST COVID-19 NEUROLOGICAL SYNDROME – A LONG-TERM STUDY

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ABSTRACT

It has been over a year of global Coronavirus pandemic spreading all over the world. In recent times, the scientific data is daily updating with information for Post Covid-19 complications. Our team decided to research what is the Post Covid-19 Neurological Syndrome (PCNS) among patients who passed through our practice for the last couple of months. More and more are the people who complain of symptoms such as fatigue, insomnia, anxiety, headache, vertigo, depression and memory loss. A questionnaire was used for this study, including cerebral symptoms. For collecting the data we called them and conducted the interview virtually. Our study confirms the existence of the neurological syndrome already described in the POST COVID scientific papers, showing that one of the most persistent symptoms of "fatigue" may be associated with it, combined or not with others.

Key words: Post Covid-19 Neurological Syndrome, PCNS, Covid-19.

BACKGROUND

It has been over a year of global Coronavirus pandemic spreading all over the world. And we now have enough database to research the post-viral complications especially on the human brain. Now it is known that there is a Post Covid-19 Neurological Syndrome, called PCNS. We are still learning about the long-term impact on the nervous system but we can make some conclusions that the consequences are similar to post stroke ones (1). The acute neurological manifestations were reported as suffering of ischemic stroke (2, 3). The long-term neurological manifestations were reported over a decade ago among SARS-survival population. Psychiatric morbidities and chronic fatigue persisted and continued to be clinically

syndromes, the prolonged fatigue isn't explicable by any apparent structural damage. The 'brain fog' or problems with the memory and concentration generally don't include these kinds of cognitive problems persisting after people have had influenza, for example (5). Loss of smell has become a characteristic presentation for Covid-19, and in some people that symptom is persisting after the acute phase of the illness (5). Most clinically stable patients suffered from significant posttraumatic stress symptoms associated with the COVID-19 (6). A number of factors can act to inhibit the key cellular changes upon which viruses act, with melatonin being one such factor (13) and this can be the main pathologic reason in patients with complains of insomnia. Therefore, they should be treated with hormones. The impact of the CoV-2 infection on the onset and progression of neurodegenerative and neuropsychological diseases should be

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regarded as the potential cause of a delayed pandemic that may have a major public health impact in the medium to long term. The cognitive functions should be closely monitored in COVID-19 survivors (7). The health care providers should be aware that patients with COVID-19 can present encephalopathy in the acute setting and during hospitalization (8). The patients surviving COVID-19 are at high risk for subsequent development of neurological diseases

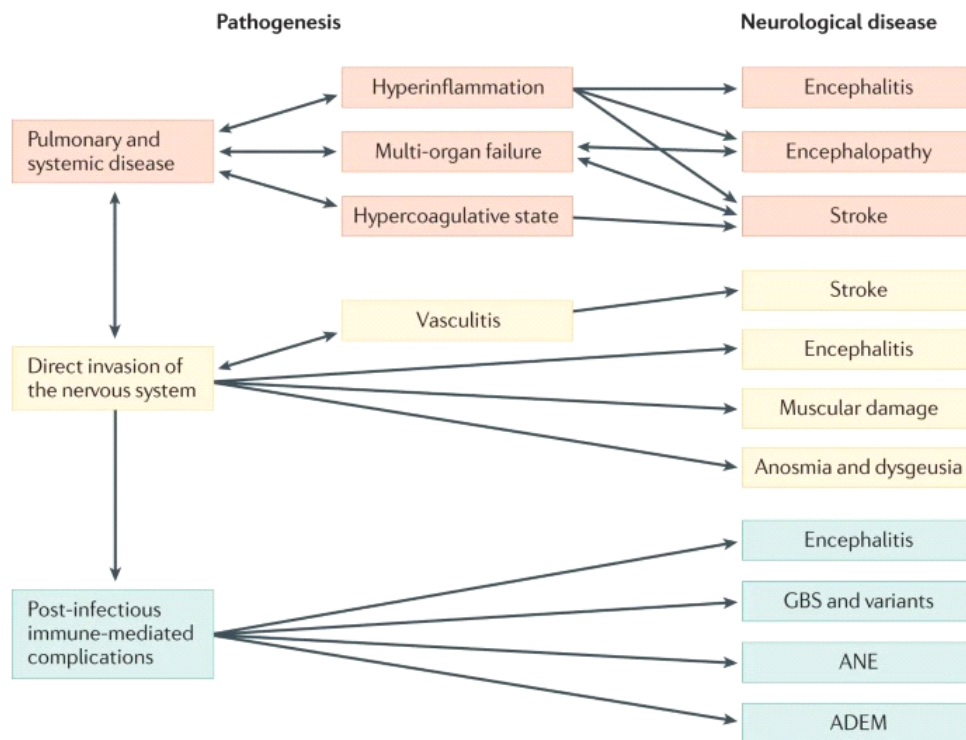
and, in particular, Alzheimer’s disease (9). Past publications highlight that severe acute respiratory syndrome coronavirus (SARS) and Middle East respiratory syndrome coronavirus (MERS) infections culminated in a high prevalence of prolonged neurological impact (10-12). Commonly the acute and late neurological symptoms can be determined as the following (Table 1).

Table 1. Acute and Post-viral neurological symptoms (14, 15).

Acute	Post-viral
• Anosmia	• Acute disseminated encephalomyelitis
• Myalgia/myositis	• Acute necrotizing hemorrhagic encephalopathy
• Encephalopathy	• Transverse myelitis
• Stroke	• Guillain-Barré syndrome
• Meningitis/encephalitis	• Multisystem inflammatory syndrome (Kawasaki’s disease)
• Seizures	• Myalgic encephalomyelitis/chronic fatigue syndrome
• Peripheral neuropathy	• Dysautonomia
• Rhabdomyolysis	

The neurological diseases that have been observed in individuals with severe acute respiratory syndrome coronavirus 2 (SARS-

CoV-2) infection can be split into three categories on the basis of the presumed underlying mechanism (Figure 1).



CONTINGENT AND METHODS

A questionnaire was used for this study, including cerebral symptoms. The questionnaire includes eight cardinal claimed symptoms by patients, months after surviving from Covid-19 infection. For collecting the data we called them and conducted the interview virtually. The data we have received, was statistically processed and the results were presented in tables and diagrams. The total number of cases is 34 (23 men and 11

women). Each patient voluntarily agreed to provide the data for this study.

RESULTS

The age range of included patients is between 34 and 78 years. It makes the impression that there are no age-likeable peaks for Covid-19. The age dispersion is smooth and consequent without missing age groups (**Figure 2**).

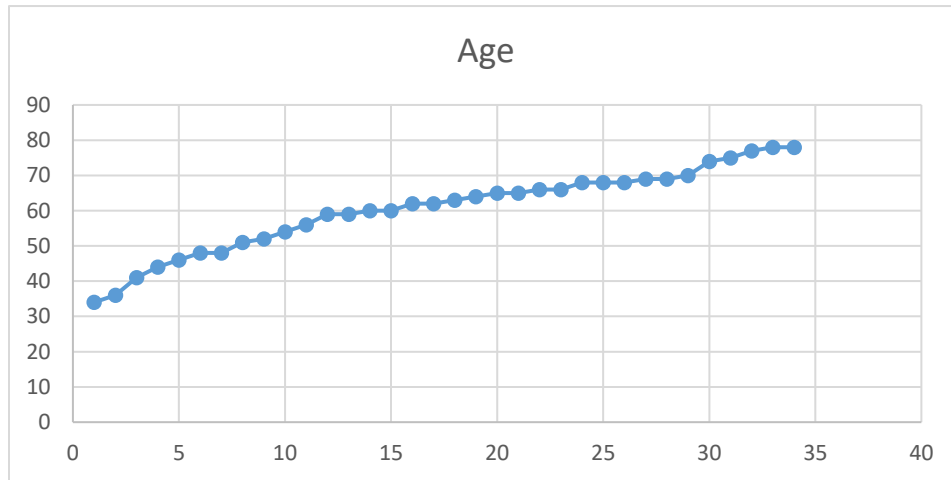


Figure 2. Patient`s dispersion by age

We observed 8 symptoms, one of which is vertigo. The vertigo doesn't occur among all the patients. The symptoms depression, memory loss and headache occurred in a small number of Covid-19 survivals and we can't accept them as a result of the infection because 10% have no

statistical importance. On the other hand, there is a slight frequency with the next 3 symptoms – myalgia, insomnia and anosmia with 14-16%. The symptom „fatigue,“ is the most frequent from all cerebrals and reaches 26%. This result is clearly represented in the next diagram (**Figure 3**)

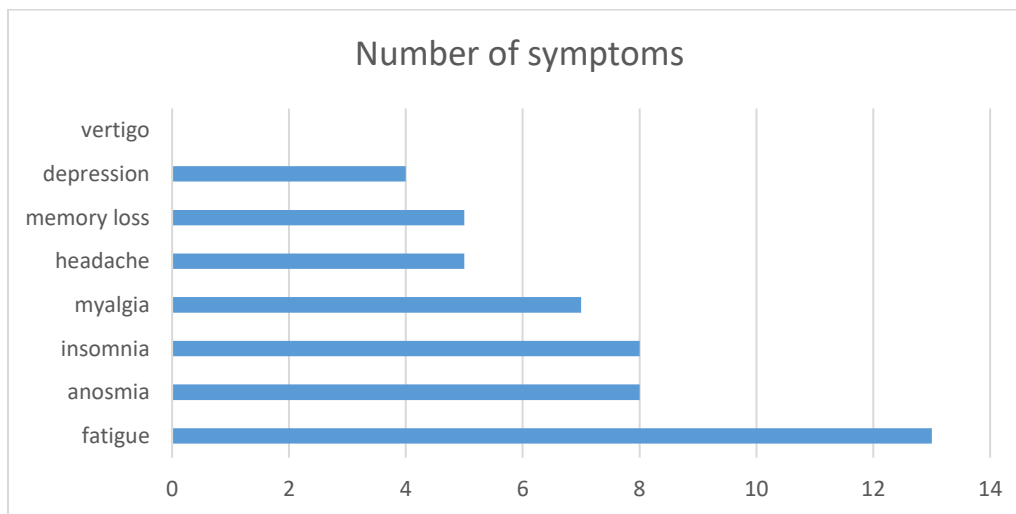


Figure 3. Number of each symptom.

Our research is based on 34 patients passed through our hospital and/or ambulatory in the last year. They are chosen from each month evenly on a random basis. The sample is composed by one-

third women and two-third of men. The symptom „fatigue,“ can be associated with Post Covid Neurological Syndrome, combined or not with other one (Figure 4).

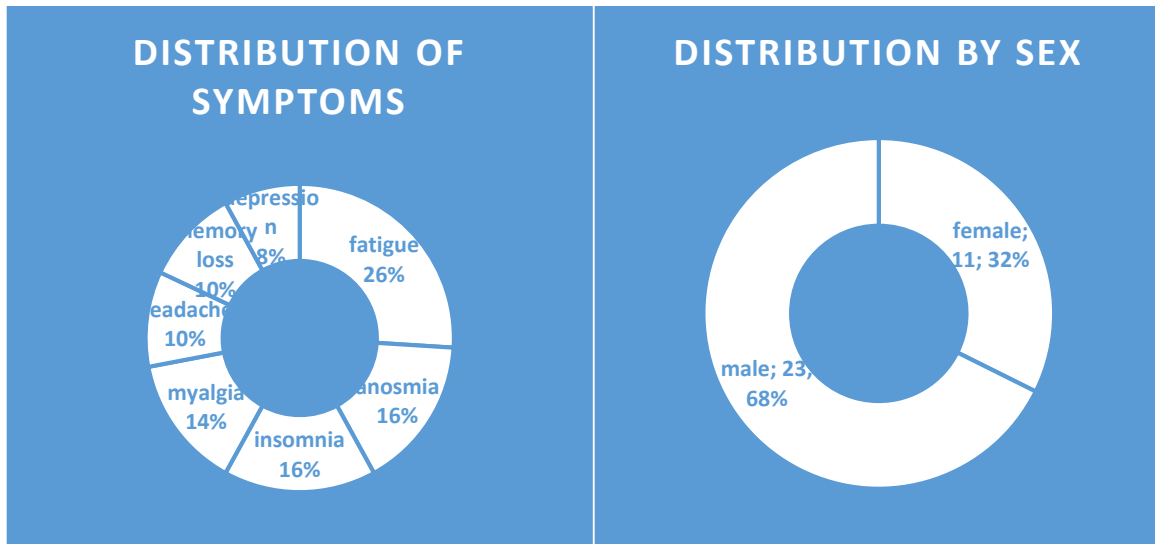


Figure 4. Distribution of symptoms pie to the left and Distribution by sex to the right.

DISCUSSION

The current study aims to monitor the long-term neurological symptoms of the COVID -19 infection, thus making it possible to outline the POST COVID neurological syndrome, as the manifested cerebral symptoms are not associated with active infection, but they are essentially its consequence remaining post stroke invalidation (2, 3, 5). The surveys that we made show that fatigue is the most common symptom, as it is the same with the brain fog (5). It cannot be considered as part of the asthenodynamic syndrome, often observed in the acute phase of the disease. Fatigue can be considered a common but not specific symptom of the POST COVID neurological syndrome, combined or not with other manifestations. In a part of the studied population it is combined with persistent anosmia, insomnia and myalgia. Depression, memory disorders, dizziness and headache are much less common.

CONCLUSION

Our study confirms the existence of the neurological syndrome already described in the

POST COVID scientific papers, showing that one

of the most persistent symptoms of "fatigue" may be associated with it, combined or not with others. It creates a perspective for the development of strategies for monitoring, evaluation and possible treatment of patients months after suffering from the COVID-19 infection. Because of the low number of patients, our study opens up opportunities for future research of this topic.

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