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Short Communication

Post-Covid cognitive fog: A growing neuropsychological concern

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Abstract

COVID-19 pandemic created long-lasting health-related issues that go well beyond the active phase of the infection. Among the so far underestimated and underreported sequelae is cognitive fog: the sense of inability to think properly, after surviving COVID-19. This condition is characterized by memory errors, ability impairments and executive dysfunction and mental fatigue witnessed in a variety of depths including the people who have initially mild bouts of illness. Mental mist has major detrimental effects on work and life experiences of adults in the working age. Although there is increased awareness of this syndrome, there is no clear understanding of its pathophysiology, currently, there are no guidelines that are used to diagnose the syndrome, and there are no uniform treatment options. The present brief communication attempts to overview clinically, epidemiologically, diagnostically, and therapeutically the post-COVID cognitive fog, basing on the reports of recent peer-reviewed literature and meta-analyses.

Keywords: COVID-19, Cognitive dysfunction, Brain fog, Neuropsychology, Long COVID, SARS-CoV-2.

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1. Introduction

Post-acute sequelae of SARS-CoV-2 infection (PASC) or long COVID was the result of COVID-19 due to a broad set of long-term concerns. Cognitive fog, sometimes called brain fog is one of the most invasive symptoms as it denotes the presence of insidious neurocognitive effects that may last several weeks or even several months after contracting the infection. The victims usually complain of the reduced cognitive levels, forgetfulness, loss of concentration and multitasking abilities. They usually appear even in those patients, who did not need to stay in the hospital or were slightly ill. People who are most often affected are the young professionals and healthcare workers who are usually in the prime of their cognitive abilities. It can be rather strong, in particular because the complaints themselves are rather subjective, and there are also no established and accepted diagnostic milestones.[1,2]

1.1. Symptom profile and epidemiology

Cognitive fog as a post-COVID condition usually appears in the range of 2 to 12 weeks after the recovery, but symptoms may last over 1 year. Reported symptoms are memory loss, attention deficit disorders, executive dysfunction, slowed speed of processing and chronic mental fatigue. Russell et al. (2024) undertook a large cohort study and found out that even the non-hospitalized COVID-19 survivors reported cognitive problems that persisted as much as 30 percent of the persons surveyed. There was increased prevalence in women, middle-aged people and those with previous mood disorders.[1] The common cognitive screening instruments such as the MMSE or MoCA instruments might miss subtle deficits; rather, sensitive tools such as the Trail Making Tests or the computerized neurocognitive batteries have been identified to be more effective in identifying mild cognitive impairment in such patients. Notably, such symptoms often occur in concomitance with the anxiety, depression, and sleeping disorders which complicate the clinical interpretation of the symptoms.[3]

1.2. Differential diagnosis

Based on the post-COVID cognitive complaints, clinicians will have to take into consideration a number of differential diagnoses. These symptoms can be mimicked or worsened by primary psychiatric disorders, in particular depression and

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anxiety, and take the form of poor concentration, memory, and executive problems. Issues relating to sleep such as insomnia and obstructive sleep apnea are also known to have a mental performance deficiency on their own, this has to be excluded as well. Moreover, influences of medications, especially sedatives, anticholinergic medications, or polypharmacy in old-aged patients, may have a profound impact on the intellectual process. It should also be noted that one should also screen pre-existing neurocognitive disorders, like the early stage dementia, attention-deficit/hyperactivity disorder (ADHD), or functional cognitive disorder, that may either manifest it, or reveal it after infection. Quality assurance of clinical history, careful mood, neuropsychological tests are needed to correctly exclude these options and prove a case of post-COVID cognitive dysfunction.[5]

1.3. Pathophysiology

Multi factorial, the mechanisms underlying cognitive fog post-COVID are incomplete:

1. Neuroinflammation: High cytokines (i.e. IL-6, IL-1b, TNF-alpha) during the acute infection are able to disrupt the integrity of blood-brain barrier as well as induce the stimulation of glial cells leading to chronic neuroinflammation.
2. Microvascular Thrombosis and Hypoxia: Acute hypoxic damage and microvascular impairment can occur in those parts of the brain linked to attention and executive functioning.
3. Autoimmune Mechanisms: The production of autoantibodies that attack neuronal proteins could be as a result of molecular mimicry.
4. Direct Viral Intrusion: However less justified, there is also a possibility that SARS-CoV-2 may enter the CNS through olfactory bulb.
5. Psychosocial Factors: The subjective cognitive symptoms can be aggravated by a long-standing isolation, stress, and trauma.[4]

1.4. Public health impact

The cognitive sequelae of COVID-19 are a significant issue of concern to public health, especially in countries with low- and middle-incomes, where there is no long term follow-up system. There is no methodology of the neurocognitive assessment designed after the infection and therefore, underreporting and underdiagnosis occur in India. Victims tend to experience low performance at workplaces, school performance, and social withdrawal. Cognitive fog in clinical fields is regarded as a potential risk of rise in medical errors, development of emotional burnout, and absenteeism. These effects emphasize that cognitive screening is necessary to become a part of the routine post-COVID follow-up.[2,3]

1.5. Recent research and data highlights

The recent studies have demonstrated the weight and importance of post-COVID cognitive fog. Reviewing the available information on cognitive outcomes in several intervention trials, Whitaker-Hardin et al. (2025) stated that brain fog prevalence among long COVID patients exceeds 25 percent, and processing speed and working memory they are the most likely to have impairments.[6] Quan et al. (2023) have also revealed that about a third of patients with long COVID presented with observable cognitive dysfunction, although a considerable proportion of those persons lacked proper assessment and care of their symptoms.[3] Moreover, Ozanic et al. (2025) highlighted the diagnostic difficulties related to this condition and explained them by the lack of clinical knowledge, unequal recognition, and absence of uniform diagnostic criteria in the contemporary clinical practice.[2]

1.6. Diagnostic challenges

When it comes to diagnostics, the lack of the standardized criteria makes it challenging to diagnose post-COVID cognitive fog. Issues that cannot be visualized maybe experienced subjectively by particularly, high-functioning individuals that they may not be matched against objective test results. Although comprehensive neuropsychological batteries are best, it is costly and not very available. Recent attempts have resulted in the creation of the Post-COVID Cognitive Impairment Scale that has turned out to be efficient in clinical validation investigations. However the frontline screening tools should be simple, sensitive, and acceptable to deploy in a mass way.[5]

1.7. Management and rehabilitation

The management of cognitive fog has no unified formula. Many aspects of management are personal and interdisciplinary:

1. Cognitive Rehabilitation: Specific practice to enhance memory, attention and processing speed.
2. Lifestyle: Aerobic exercise, nutrition support, and organised sleep hygiene.
3. Psychological Support: CBT themed support, mindfulness practices and psychoeducational support.
4. Pharmacotherapy: Drugs such as modafinil and bupropion can provide symptomatic effects but these are not supported with solid clinical trial evidence.
5. Systemic Approach: Establishment of specialized neuro-COVID with real doctors: neurologists, psychologists, and therapists can enhance the outcomes.[6]

2. Conclusion

Cognitive fog is a dynamic and little-known neuropsychological sequelae of the pandemic. It is a problem to the health care systems and work productivity among the young and middle-aged adults. Standardized testing devices, specific rehabilitation procedures and better awareness

amongst the clinician are of absolute necessity. Despite minimal resources, including some form of cognitive assessment in regular post-COVID care may help greatly enhance the quality of life in the survivors, as well as the overall implications of the virus infection on the society.

3. Conflict of Interest

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