



THE IMPACT OF 'LONG COVID-19' SYMPTOMS ON STROKE PATIENTS DURING THE COVID-19 PANDEMIC

Wahyu Dwihardi Raputra*

*Correspondence: wahyu.nerek1991@gmail.com

Muhammadiyah Siti Khodijah Hospital Gurah, Kediri, Indonesia

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ABSTRACT

Background: Coronavirus disease 2019 (COVID-19) has become a global pandemic, affecting millions of people. However, the relationship between COVID-19 and acute cerebrovascular diseases is unclear.

Objective: This study aims to examine the potential effect of long COVID-19 on stroke patients.

Methods: A descriptive approach was employed in this study to effectively portray and elucidate the facts, data, and information that were gathered from literature studies, including books, journals, and, and results related to the topic.

Results: The results showed that stroke sufferers experienced several impacts due to their long COVID conditions. These perceived effects ranged from seizures to cognitive impairment or brain fog, encephalitis, as well as other symptoms that are likely to aggravate the condition of stroke sufferers.

Conclusion: The presence of the pandemic has introduced further obstacles for stroke patients who are also dealing with long COVID-19 conditions. If left unattended, these challenges can result in heightened complications, severity, comorbidities, and even death. Therefore, the government needs to prioritize the prevention and control of long COVID condition among patients to minimize its impacts and effects.

Keywords: long COVID, patient, stroke sufferer

Introduction

At the end of 2019, a pneumonia-like illness caused by the SARS-CoV-2 virus, commonly referred to as the coronavirus emerged in China and quickly became an epidemic. This disease is characterized by symptoms such as fever, fatigue, dry cough, and in some cases, digestive problems.¹ In January, several countries worldwide started reporting cases with similar characteristics and symptoms, prompting the World Health Organization (WHO) to declare it a pandemic in March 2020. Indonesia also identified its first case in March 2020 and has since experienced a significant increase in cases.²

The surge in cases is closely linked to the discovery of new coronavirus variants, including Omicron, which was detected in Botswana and South Africa in late November 2021. Furthermore WHO classified it as a Variant of Concern due to its potential to change the trajectory of the pandemic.³ Numerous studies found that Omicron is substantially more contagious

than other variants and it has the ability to evade significant immunity. This means that the variant can penetrate the immune protection defense system maintained by antibodies through vaccine administration.⁴

The primary cause of this outbreak is the highly transmissible nature of the virus, primarily through human-to-human contact. This occurs through droplets released when an infected person sneezes or coughs, and these droplets have a transmission distance of about 2-3 meters. To minimize the transmission of COVID-19, social distancing measures have been implemented including keeping a distance and implementing health protocols by wearing masks, regular hand washing, and disinfection using alcohol.⁵

This enforced social distancing certainly had a significant effect on other sectors such as the occurrence of restrictions on health services including patient visits to health service providers.⁶ Similarly, stroke patient rehabilitation centers have limited their

services and patient visits to avoid overcrowding.⁷ Stroke, although a non-communicable disease, poses a complex challenge in the field of healthcare and is the second-leading cause of death worldwide after systemic heart disease.⁶ Neurological disorders are the main cause of stroke, which is more prevalent in developing countries with the highest mortality rate of 1 in 6 patients. Stroke can be divided into 3 types, namely ischemic stroke (80%), intracerebral hemorrhage (15%), and subarachnoid hemorrhage (5%).⁸ Given the current circumstances, the transmission of the coronavirus has further complicated the urgency of treating stroke sufferers. Both stroke sufferers who contract COVID-19 and those who experience aftereffects face significant impacts and challenges in their recovery process, therefore, this study aims to examine the effects of long COVID-19 conditions on stroke patients.

Methods

In this study, a literature review design was employed to thoroughly examine and critically analyze academic-oriented knowledge, ideas, and scientific findings. The aim was to contribute theoretically and methodologically to the selected topic. Descriptive analysis was selected as the primary method of analysis to provide a comprehensive description of problems and potential solutions. The qualitative approach was used to obtain data about facts and issues that have occurred, specifically to describe and explain the effect of the long COVID Omicron variant on stroke patients.

Results

Globally, the number of confirmed COVID-19 cases has surpassed 160 million with over 3 million deaths and while the majority of infected individuals eventually recover, many continue to experience symptoms and complications after their acute illness. Patients with 'Long COVID', experience a variety of physical and mental/psychological symptoms and the average recovery time is 2-3 weeks depending on the severity of symptoms. However, 1 in 5 people, regardless of the severity of their acute infection, may have symptoms for 5 weeks or more, and 1 in 10 may have symptoms lasting 12 weeks or more. There is no consensus on the precise definition of the duration or criteria that determine the persistence of symptoms beyond the acute infection phase.⁷ The followings are the characteristics and symptoms caused by long COVID-19.

The medium and long-term effects of COVID-19, as well as its overall impacts on health, are not fully understood, but available evidence suggests that people with long COVID tend to experience a

significant reduction in their quality of life. Frequently reported residual effects from the SARS-CoV-2 virus include fatigue, dyspnea, chest pain, persistent loss of taste and/or smell, cognitive changes, arthralgias, and decreased quality of life. Many of these symptoms stem from widespread neuropathological events occurring in major white matter bundle tracts, as well as cortical and subcortical gray matter. People living with Long COVID have indicated that they suffer from a variety of symptoms and a feeling of being 'abandoned' or 'ignored' by healthcare providers. More than one-third of patients in a study reported feeling sick or in a worse clinical condition at eight weeks than at the start of the pandemic.¹⁰ Another study conducted in the United States by Chopra et al., reported that 33% of the patients had persistent symptoms for 60 days after hospitalization.¹¹

A detailed investigation into long-term COVID is currently limited due to a lack of understanding of its underlying mechanisms. The uncertainty surrounding the most effective management strategies for patients suffering from long COVID has led several countries to develop clinical guidelines aimed at assisting healthcare providers in addressing this condition. These guidelines emphasize that effective management may require a multidisciplinary approach, involving continuous and long-term monitoring of symptoms, early identification of potential complications to enable timely clinical interventions, and the provision of targeted physical rehabilitation programs. Furthermore, ensuring adequate mental health care, along with access to social service support, is equally crucial in helping patients cope with the persistent physical and psychological challenges posed by long COVID (Table 1).

Table 1. Signs and symptoms of Long COVID⁹

Abnormalities	Symptom
Cardiopulmonary	Fatigue, shortness of breath, chest pain, palpitations
Naso-oropharyngeal	Loss of smell (anosmia), dysgeusia (change in taste), sore throat, cough, hoarseness, hearing loss, sinusitis, earache, sneezing
Musculoskeletal	Diarrhea, nausea, loss of appetite, weight loss, vomiting, gastritis
Neuro-psychiatry	Joint pain (arthralgia), muscle pain (myalgia), memory loss (amnesia), difficulty thinking/inability to concentrate, brain fog/cognitive impairment, disorientation, sleep disturbances such as insomnia, visual disturbances, anxiety, depression, tremors, seizures
Others	Fever, headache, dizziness, skin rash, hair loss, red eyes, hot face, stomach ulcers, bladder incontinence

Discussion

Several studies conducted in different countries have reported significant impacts of COVID-19 on stroke patients who appeared to be more susceptible to severe infections than others, and the pandemic has made it even more difficult to receive care from health professionals, given the limited and dangerous conditions. Statistics illustrated that the number of recorded acute stroke sufferers decreased by 50% to 80% in several countries during the pandemic. This means that many patients were not hospitalized even though they suffer moderate or even severe strokes. Several mechanisms that allow COVID-19 to increase the risk of stroke have been identified.¹²

Numerous studies stated that stroke patients diagnosed with COVID-19 were more likely to develop comorbidities and ARDS or Acute Respiratory Distress Syndrome. Patients with a medical history of stroke have more underlying comorbidities and a greater degree of disease severity than those without previous strokes.¹³ Similarly, another study found that patients with COVID-19 with a history of stroke (study cohort) had more comorbidities and worse clinical outcomes than the control. A cohort study also reported that stroke survivors who contracted COVID-19 were more likely to develop ARDS than non-stroke patients. In other words, patients with stroke have a higher risk of developing acute pneumonia and subsequent death than normal patients.¹¹

Stroke patients not only experience the impacts of being diagnosed with the virus but also suffer from several symptoms during the Long COVID phase. These symptoms include encephalitis, seizures, and other conditions such as severe mood swings and cognitive impairment (brain fog) which can persist for two to three months after the onset of the acute illness. Magnetic resonance imaging scans of patients previously hospitalized with COVID-19 demonstrated possible disturbances in the microstructural and functional integrity of the brain at three months of follow-up.¹⁶ These findings highlight the neuro-invasive capabilities of the SARS-CoV-2 virus and its potential long-term consequences on the sufferers. According to a recent study, a history of stroke in COVID-19 patients was independently associated with an increased incidence of severity and worse outcomes.¹⁸ This was attributed to the aggressive inflammatory response and underlying coagulation disorders in stroke patients who experience long COVID.^{14,17}

In addition, the pandemic has significantly disrupted the development of stroke treatments such as consultation and reperfusion, especially thrombolysis therapy. Thrombolysis delays appeared to have

persisted during the pandemic, prompting healthcare providers to re-evaluate their local paradigms for accelerating stroke treatment.¹⁹ The existing review confirmed that the current pandemic has a diverse impact on stroke patients, both directly and indirectly.²⁰ The commonly reported findings include delayed stroke treatment, increased complications and stroke severity, disability, mortality, co-morbidities, as well as prolonged hospitalization. It was predicted that the upcoming year will likely be a time filled with challenges and uncertainties for stroke care.¹⁵

Conclusion

Based on the results, it can be concluded that long COVID is a health condition where an individual continues to experience symptoms of COVID, even after being declared cured. In stroke sufferers, this condition has several significant effects, ranging from encephalitis to cognitive impairment or brain fog culminating in a more aggressive inflammatory response, and underlying coagulation disorders. Therefore, governments, health institutions and professionals, as well as individuals must adapt their work practices accordingly. Health protocols should also be effectively followed as part of efforts to protect health workers and patients. Furthermore, it is important to investigate the long-term impact of COVID-19 on stroke patients after the pandemic.

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