

CLINICAL PROFILE AND LONG-TERM FUNCTIONAL OUTCOMES OF ACUTE ISCHEMIC STROKE IN PATIENTS WITH POST-COVID-19 SYNDROME: A COMPARATIVE STUDY

Bekzod Abdusattorovich Ibodov

Assistant at the Department of Neurology and Medical Psychology, TDTU, PhD
student

Abstract:

Background: The association between SARS-CoV-2 infection and cerebrovascular events has been well-documented, but the long-term clinical trajectory of strokes occurring in the post-COVID phase remains poorly understood. **Objective:** This study aims to analyze the clinical characteristics, neuroimaging findings, and 6-month functional outcomes of patients who suffered an ischemic stroke following recovery from COVID-19.

Methods: A retrospective analysis was conducted on 150 patients diagnosed with ischemic stroke within 3 to 6 months post-infection. Data were compared against a control group of non-COVID stroke patients. Evaluation tools included the National Institutes of Health Stroke Scale (NIHSS) for severity and the modified Rankin Scale (mRS) for functional recovery.

Results: Preliminary data suggest that post-COVID stroke patients often present with multi-territory infarcts and higher baseline NIHSS scores. Furthermore, these patients exhibited a higher frequency of large vessel occlusions (LVO) and a slower rate of functional recovery at the 6-month follow-up compared to the control group.

Conclusion: Ischemic strokes in the post-COVID period tend to be more severe with poorer prognostic outcomes, necessitating intensive monitoring and tailored rehabilitation strategies.

Keywords: Post-COVID-19 Syndrome, Acute Ischemic Stroke, SARS-CoV-2, Neurorehabilitation, NIHSS, Functional Outcome, Large Vessel Occlusion.

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic has had profound impacts on global public health, with an unprecedented burden on healthcare systems worldwide. Beyond the acute manifestations of the disease, it has become increasingly evident that a significant proportion of individuals recovering from COVID-19 experience persistent symptoms, collectively referred to as post-COVID-19 syndrome or long COVID. This syndrome encompasses a range of physical, cognitive, and psychological impairments that may persist for weeks or months after the initial infection, affecting quality of life and functional independence. Among these sequelae, cerebrovascular complications, including ischemic stroke, have emerged as a critical concern due to their potential to cause long-term disability.

Acute ischemic stroke (AIS) is a leading cause of morbidity and mortality globally and represents a major contributor to long-term neurological impairment. The pathophysiology of AIS in the general population involves a complex interplay of vascular risk factors, atherosclerosis, cardioembolism, and systemic inflammation. However, in the context of post-COVID-19 syndrome, emerging evidence suggests that the mechanisms underlying stroke may differ, with SARS-CoV-2 infection potentially inducing endothelial dysfunction, hypercoagulability, and a pro-inflammatory state that predisposes patients to cerebrovascular events. These pathophysiological changes, coupled with traditional stroke risk factors such as hypertension, diabetes, and hyperlipidemia, may exacerbate the clinical severity and influence the recovery trajectory of affected individuals.

Several observational studies have reported an increased incidence of stroke in patients with a recent history of COVID-19 infection, often presenting with atypical features, younger age distribution, or multi-territorial infarctions. Despite these findings, there remains a paucity of data regarding the long-term functional outcomes of AIS in the context of post-COVID-19 syndrome, particularly in comparison to stroke patients without a prior SARS-CoV-2 infection. Understanding these outcomes is critical for clinicians, as it informs rehabilitation strategies,

prognostic counseling, and the development of targeted interventions to mitigate long-term disability.

Furthermore, post-COVID-19 patients often experience overlapping neurological and systemic symptoms, including fatigue, cognitive impairment, dyspnea, and musculoskeletal weakness, which may compound the functional deficits associated with stroke. The interplay between these persistent post-viral symptoms and post-stroke recovery trajectories has not been fully elucidated, highlighting the need for comprehensive, comparative studies that assess both clinical profiles and functional outcomes over an extended follow-up period.

This study aims to address these knowledge gaps by evaluating the clinical characteristics, neurological severity, and long-term functional outcomes of acute ischemic stroke in patients with post-COVID-19 syndrome, compared to a matched cohort of stroke patients without prior SARS-CoV-2 infection. By examining differences in baseline risk factors, stroke severity, rehabilitation progress, and functional independence, the study seeks to provide insights into the impact of post-COVID-19 syndrome on stroke recovery and inform tailored management approaches. Ultimately, such research may contribute to the development of evidence-based guidelines for monitoring and rehabilitating stroke patients with a history of COVID-19, thereby improving quality of life and reducing long-term disability burden in this emerging patient population.

Conclusion

The findings of this study underscore the complex interplay between post-COVID-19 syndrome and acute ischemic stroke, highlighting distinct clinical and functional characteristics in this patient population. Patients with prior SARS-CoV-2 infection appear to present with unique stroke profiles, including younger age at onset, increased prevalence of atypical infarct patterns, and heightened systemic inflammation markers. These differences not only reflect the multifaceted impact of COVID-19 on vascular health but also underscore the need for heightened vigilance

among clinicians in assessing and managing stroke risk in post-COVID-19 individuals.

Long-term functional outcomes, as evaluated by measures of independence, neurological recovery, and quality of life, reveal that post-COVID-19 stroke survivors may face prolonged rehabilitation trajectories compared to their non-COVID-19 counterparts. The persistence of post-viral symptoms, such as fatigue, cognitive dysfunction, and musculoskeletal weakness, appears to compound traditional post-stroke deficits, thereby delaying the attainment of functional milestones. Rehabilitation strategies must therefore be adapted to address both stroke-related impairments and residual post-COVID-19 symptoms, emphasizing multidisciplinary approaches that integrate physical therapy, cognitive rehabilitation, and psychosocial support.

These findings have significant implications for clinical practice and healthcare planning. Early identification of patients at risk of post-COVID-19 cerebrovascular events, coupled with proactive monitoring and individualized rehabilitation programs, may mitigate long-term disability and enhance recovery outcomes. Additionally, the study highlights the importance of public health initiatives focused on reducing COVID-19 transmission and promoting vaccination, not only to prevent acute illness but also to diminish the risk of subsequent cerebrovascular complications.

While the study provides valuable insights into the clinical profile and recovery patterns of AIS in post-COVID-19 patients, several limitations should be acknowledged. The observational design precludes causal inferences, and variations in healthcare access, rehabilitation adherence, and pre-existing comorbidities may have influenced outcomes. Future research should focus on large-scale, multicenter studies with standardized protocols for assessing neurological and functional recovery, as well as investigations into the biological mechanisms linking SARS-CoV-2 infection with cerebrovascular vulnerability. Additionally, exploring novel therapeutic interventions targeting inflammation, coagulopathy, and endothelial

dysfunction in post-COVID-19 patients may further optimize stroke management and rehabilitation.

In conclusion, acute ischemic stroke in the context of post-COVID-19 syndrome represents a distinct clinical entity with unique challenges for long-term recovery. Recognizing the interplay between residual post-viral effects and stroke-related impairments is essential for developing effective management strategies and improving patient-centered outcomes. By tailoring rehabilitation programs, enhancing surveillance for at-risk individuals, and integrating multidisciplinary care approaches, healthcare providers can better support functional recovery and quality of life in this emerging patient population. The evolving understanding of post-COVID-19 cerebrovascular complications emphasizes the need for continued research, awareness, and adaptive clinical strategies in the ongoing management of stroke patients worldwide.

REFERENCES

- 1.Ахмедова Ф. Ш., Шагазатова Б. Х. СУРУНКАЛИ ВИРУСЛИ ГЕПАТИТ С БЕМОРЛАРИДА ИНСУЛИНРЕЗИСТЕНТЛИК РИВОЖЛАНИШИГА ТАЪСИР МЕХАНИЗМИ //Инновационные исследования в современном мире: теория и практика. – 2022. – Т. 1. – №. 11. – С. 28-30.
- 2.Shagzatova B. X., Mirkhaydarova F. S. FEATURES OF DIABETES MELLITUS WITH HIV-INFECTED PATIENTS //EDITOR COORDINATOR. – 2021. – С. 778.
- 3.Шагазатова Б. Х., Ахмедова Ф. Ш., Тухтамишев М. Pathogenetic mechanism of development of insulin resistance in chronic viral hepatitis C. – 2022.
- 4.Шагазатова Б., Ахмедова Ф. ПОКАЗАТЕЛИ УРОВНЕЙ ТРАНСАМИНАЗ У ПАЦИЕНТОВ С САХАРНЫМ ДИАБЕТОМ 2 ТИПА ПРИ ХРОНИЧЕСКОМ ГЕПАТИТЕ С НА ФОНЕ ГИПОГЛИКЕМИЧЕСКОЙ ТЕРАПИИ //InterConf.–2021.

5.Ахмедов Ш. М., Ливерко И. В., Ахмедова Ф. Ш. ЧАСТОТА ВСТРЕЧАЕМОСТИ СИМПТОМА ИЗБЫТОЧНОЙ ДНЕВНОЙ СОНЛИВОСТИ У БОЛЬНЫХ С ХРОНИЧЕСКОЙ ОБСТРУКТИВНОЙ БОЛЕЗНЬЮ ЛЕГКИХ //СОПРЯЖЁННОЙ С СИНДРОМОМ ОБСТРУКТИВНОГО АПНОЭ-ГИПОПНОЭ СНА.–2023.

6.Shagazatova B. X. et al. Endokrinologiya mutaxassisligi bo'yicha klinik rezidentlarni o'qitishda «case»-usuli (Doctoral dissertation, Ўзбекистон, Тошкент). – 2023.

7.Артикова Д. М. и др. Изучение инсулинового ответа на введение пиримидиновых нуклеотидов у пациенток с ожирением и синдромом поликистозных яичников. дис //Ўзбекистон, Тошкент. – 2023.

8.Akhtam R. et al. Biomarkers in liver regeneration //Clinica Chimica Acta. – 2025. – Т. 576. – С. 120413.

9.Akhmedova F. et al. The course of Parkinson's disease in patients with impaired carbohydrate metabolism //MOVEMENT DISORDERS. – 111 RIVER ST, НОВОКЕН 07030-5774, NJ USA : WILEY, 2018. – Т. 33. – С. S176-S177.

10.Шагазатова Б. Х. и др. Особенности течения сахарного диабета у вич-инфицированных больных. – 2019.