

## Intravenous thrombolytic treatment of a patient who had a stroke after COVID-19

Thrombolytic treatment and stroke after COVID-19

Mustafa Cam, Ozgul Ocak  
Department of Neurology, Canakkale Onsekiz Mart University, Canakkale, Turkey

### Abstract

The infection, reported by the WHO as COVID-19, may occur with asymptomatic or mild symptoms, resulting in shock and even death. Stroke occupies an important place among the neurological complications of this disease. In the acute period, intravenous (IV) alteplase therapy is useful in patients suitable for the treatment.

This case report includes a 70-year-old patient with mild COVID findings, who had an early complication of stroke and who received a nearly complete benefit from thrombolytic therapy.

Stroke can occur in COVID patients at an early stage of the disease. IV thrombolytic therapy should be administered in appropriate patients during the period of acute stroke. As far as we know, the earliest application in our country was carried out in our hospital and was quite successful. After the treatment, the symptoms of COVID-19 also regressed and he was discharged on the 5th day of his hospitalization.

### Keywords

Thrombolytic treatment; Stroke; COVID-19

DOI: 10.4328/ACAM.20527 Received: 2021-02-09 Accepted: 2021-04-05 Published Online: 2021-04-13

Corresponding Author: Mustafa Cam, Canakkale Onsekiz Mart University Department of Neurology, Barbaros Street, Terzioğlu Campus, Canakkale, Turkey.

E-mail: mustafacam20@hotmail.com P: +90 5066493267

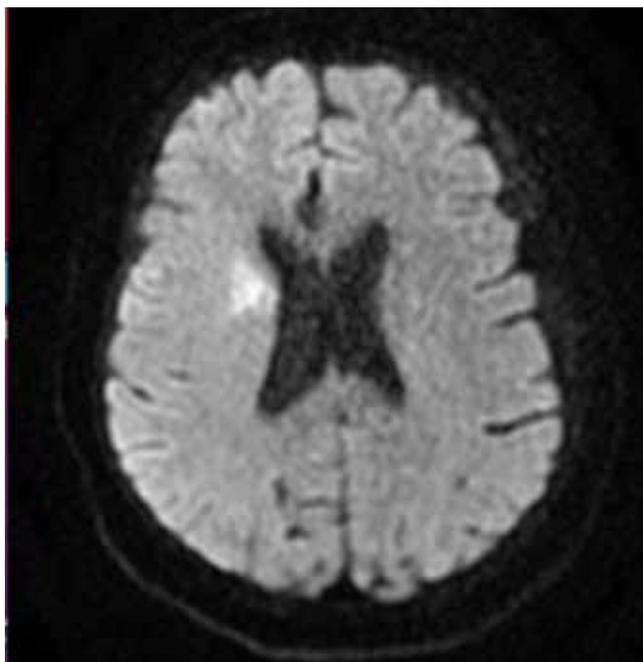
Corresponding Author ORCID ID: <https://orcid.org/0000-0003-3116-203X>

## Introduction

COVID-19 has caused millions of cases and hundreds of thousands of deaths all over the world since December 2019. According to the World Health Organization (WHO), 5 months after the virus was defined as SARS CoV-2 due to its similarity to SARS CoV, the number of cases reached 6 million and the number of deaths reached 400 thousand. The incidence of acute stroke was detected in 5.7% of hospitalized patients due to COVID-19 [1]. No contraindications have been reported for iv alteplase given as treatment to COVID-19 patients who develop acute stroke [2].

## Case Report

A 70-year-old female patient, who suddenly developed speech disorder with weakness and numbness on her left side, presented to the emergency room approximately 2 hours after the onset of her complaints. While speech was dysarthric in the patient's neurological examination, the left nasolabial groove was obscure. The muscle strength of the left upper and lower limbs was 4/5. The brain CT was normal. Diffusion restriction zones located between the right caudate nucleus head and the lentiform nucleus, and the anterior part of the insular cortex were observed in diffusion brain MRI (Figure 1).



**Figure 1.** Points out the diffusion limitation in the right caudate nucleus of a COVID-19 patient on diffusion cranial MRI

Fever was found in the examination performed in the emergency service. Respiratory system examination revealed a roughness in the breath sounds in left middle zone. Other system examinations were normal. In laboratory examinations, CRP: 5.7; Sedim: 58; WBC: 12000; LYM: 17; NEU was detected as 74%. In Torax CT, bronchiectasis enlargement in the medial segment of the right lung middle lobe and the left lung inferior lingular segment, as well as an increase in ground glass density was observed in both lungs (Figure 2). The patient, who was evaluated by the infectious diseases department, was diagnosed with COVID-19 and was started treatment.



**Figure 2.** Depicts the ground glass appearance in each posterior lobe of the lung

The patient with an NIH score of 6 was given iv alteplase treatment. Neurological examination after thrombolytic therapy was evaluated as completely normal. When the control brain tomography taken 24 hours later was found to be normal, antiaggregant treatment was started. On the 5th day of his hospitalization, the patient whose symptoms of COVID-19 regressed and partial improvement was observed in the control thorax CT was discharged with the necessary recommendations.

## Discussion

COVID-19 is considered a mutation of SARS (Severe Acute Respiratory Syndrome Virus) and MERS (Middle East Respiratory Syndrome Virus) [3]. The course of COVID-19 can progress from asymptomatic cases to complications such as severe acute respiratory disease and multiple organ failure, including acute heart and kidney damage, and eventually death may occur [4]. Coronaviruses are not primarily neurotropic viruses, and their primary target is the respiratory epithelium [1]. It is thought to cause thromboembolic events with both direct damage to the nervous system and high levels of inflammation, hypoxia, immobilization, and diffuse intravascular coagulation [5]. Increased inflammation activates the coagulation system by causing a cytokine storm, and diffuse intravascular coagulation due to thrombosis occurs in both venous and arterial systems [6]. CT scan of the chest typically reveals multiple ground-glass opacities, consolidation, and bilateral lung involvement [7]. This image was found to be compatible with the thorax CT images in our patient. Although the exact incidence is unknown, stroke is emerging as a complication of the COVID-19 pandemic. It should also be taken into account that patients may present only with a stroke clinic without classic symptoms such as fever, cough, and anorexia [8]. The clinic of our patient is also compatible with early COVID-19 findings. It should not be forgotten that a stroke is an emergency situation that needs to be taken fast in terms of diagnosis and treatment, even in the pandemic period. COVID-19 patients with acute stroke should be evaluated carefully and those who are suitable for treatment should be administered intravenous thrombolytic therapy or mechanical thrombectomy without delay, taking

into account current guidelines [9]. Our case occurred with the emergence of COVID-19 cases in our country, and although there were reservations about the application of thrombolytic therapy, it was successfully applied. As far as we can examine, iv thrombolytic therapy has not been used in our country until then. This treatment is thought to be effective in regressing symptoms of COVID-19 infection.

#### **Scientific Responsibility Statement**

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

#### **Animal and human rights statement**

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

#### **Conflict of interest**

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

#### **References**

1. Mao L, Wang M, Chen S, He Q, Chang J, Hong C, et al. Neurological manifestations of hospitalized patients with COVID-19 in Wuhan, China: a retrospective case series study. *JAMA Neurol.* 2020;77(6):683-90.
2. Zhang H, Penninger JM, Li Y, Zhong N, Slutsky AS. Angiotensin-converting enzyme 2 (ACE2) as a SARS-CoV-2 receptor: molecular mechanisms and potential therapeutic target. *Intensive Care Med.* 2020 46(4):586-90.
3. Yeshun W, Xiaolin X, Zijun C, Jiahao D, Kenji H, Ling H, et al. Nervous system involvement after infection with COVID-19 and other coronaviruses. *Brain Behav Immun.* 2020;87:18-22.
4. Team NCPERE Vital surveillances: The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19)—China. *China CDC Weekly.* 2020 2(8):113–22.
5. Tu H, Tu S, Gao S, Shao A, Sheng J. The epidemiological and clinical features of COVID-19 and lessons from this global infectious public health event. *J Infect.* 2020;81(1):1-9.
6. Tveito K. Cytokine storms in COVID-19 cases? *Tidsskr Nor Laegeforen.* 2020;23:140
7. Shuchang Z, Yujin W, Tingting Z, Liming XCT. Features of Coronavirus Disease 2019 (COVID-19) (COVID-19) pneumonia in 62 Patients in Wuhan, China. *American Journal of Roentgenology.* 2020; 20:1–8.
8. Mao L, Jin H, Wang M, Hu Y, Chen S, He Q, et al. Neurologic Manifestation of Hospitalized Patients With Coronavirus Disease 2019 in Wuhan, China. *JAMA Neurol.* 2020; 77(6):683–90.
9. Qureshi AI, Abd-Allah F, Alsenani F, Aytac E, Borhani-Haghighi A, Ciccone A, et al. Management of acute ischemic stroke in patients with COVID-19 infection: Report of an international panel. *Am J Emerg Med.* 2020; 38(7):1548.e5–1548.e7.

#### **How to cite this article:**

Mustafa Cam, Ozgul Ocak. Intravenous thrombolytic treatment of a patient who had a stroke after COVID-19. *Ann Clin Anal Med* 2021; DOI: 10.4328/ACAM.20527