

# Usefulness of telerehabilitation for stroke patients during the COVID-19 pandemic

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Dear Editor,

Since the first case of the coronavirus disease (COVID-19) was discovered in Wuhan, Hubei Province, China, in December 2019, it has spread worldwide at an unprecedented rate. While exact mortality rates vary between countries, a range from 2% to 6% has been reported, with much higher mortality rates among the elderly ( $\geq 60$  years old) and those with underlying health conditions.<sup>1</sup> Patients with a history of stroke are reported to be 2.5 times more likely to progress to a severe stage of COVID-19.<sup>2</sup> Stroke is highly prevalent among the elderly, and many patients with stroke have other underlying comorbidities such as diabetes, hypertension, and cardiovascular disease. There is thus an even higher likelihood of disease progression to the severe stage, or even death, among stroke patients with COVID-19.

As COVID-19 is transmitted via person-to-person contact, stroke patients undergoing outpatient rehabilitation therapy during the COVID-19 pandemic have an increased risk of infection, as contact with other people often cannot be avoided on the way to and from the hospital. As the frequency of contact increases, the probability of becoming infected with COVID-19 also increases. The first 6 months after a stroke is a crucial period for recovery, and subacute stroke patients with disabilities regularly undergo rehabilitation therapy at a hospital, which means that these patients have a higher risk of COVID-19. Here, we suggest the utilization of telerehabilitation for stroke patients to reduce their risk of infection.

Telerehabilitation refers to “providing rehabilitation service using electronic communication technologies”<sup>3</sup>. As such, rehabilitation therapy could be implemented remotely

without the physician and patient meeting in person. While there are many rehabilitation therapy methods and programs based on telerehabilitation, they typically involve the medical staff checking the patient's condition, showing rehabilitation therapy examples to the patient or their guardian, and using photographs or videos to demonstrate how rehabilitation therapy should be performed. Motor, language, and cognitive functions can be assessed by video or by using specially designed programs.

Many studies have analyzed the effectiveness of telerehabilitation, with the majority reporting that telerehabilitation is comparable to in-clinic rehabilitation in terms of improving motor, language, and cognitive functions. In 2019, Cramer et al.<sup>3</sup> compared the effectiveness of home-based rehabilitation for stroke patients using telemedicine (62 patients) to that of in-clinic rehabilitation (62 patients). A total of 36 therapy sessions (70 minutes each) were designed to improve arm motor function. In this study, both therapy groups displayed significant improvements in arm motor function, showing that telerehabilitation was as effective as in-clinic rehabilitation.

Furthermore, over 50% of stroke patients have depression or anxiety.<sup>4</sup> Such psychological problems could be exacerbated during the COVID-19 pandemic, because patients are isolated from the wider community. Drug therapy and counseling must be provided to these patients. With telerehabilitation, patients can receive prescriptions for medication and counseling for psychological stabilization without visiting the hospital. The effectiveness of counseling by telemedicine has been demonstrated in many previous studies<sup>5</sup>. Such a service could significantly improve the mental health of stroke patients during the COVID-19 pandemic.

With telerehabilitation, a physician can also determine whether a patient needs to be tested for COVID-19. If it is determined that there is no need for a COVID-19 test, then unnecessary hospital visits can be avoided. Moreover, for stroke patients with COVID-19 who are asymptomatic or have mild symptoms and are in self-quarantine at home, telerehabilitation could be used to check for changes in symptoms and quickly detect symptom exacerbation to ensure they receive on-time treatment.

To summarize, we examined the beneficial effects that telerehabilitation may have on stroke patients during the COVID-19 pandemic. While rehabilitation therapy is essential for such patients, becoming infected with COVID-19 could result in severe illness and death. Protecting stroke patients from COVID-19 is therefore extremely important, and we suggest telerehabilitation as a useful approach in the rehabilitation of stroke patients during the COVID-19 pandemic.

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