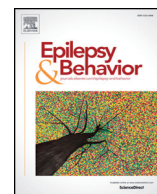




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Letter to the Editor

What should we ask patients with epilepsy on telemedicine during the COVID-19 crisis? A checklist for clinicians


To the Editor

1. Introduction

Coronavirus disease 2019 (COVID-19) is a novel infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The outbreak initially occurred in Wuhan, China in late 2019 and is spreading globally [1]. Every society has had to adapt to changes induced by the COVID-19 crisis.

Epilepsy is a chronic neurological disorder characterized by the spontaneous recurrence of unprovoked seizures. In the field of neurology, as well as other areas of medicine, telemedicine is recommended as an alternative to outpatient practice during the COVID-19 crisis to avoid the risk of exposure to SARS-CoV-2 [2]. Clinicians are attempting to change their practice style because of this worldwide crisis. Here, we provide suggestions as well as a checklist for clinicians to introduce telemedicine during this crisis (Fig. 1).

2. Information to collect from patients with epilepsy during the COVID-19 crisis
2.1. Checkpoint 1: general information

In case of a new patient, basic information including clinical history, family history, medical history, birth and developmental history, and physical/neurological findings are necessary on telemedicine, as well as visiting clinics.

2.2. Checkpoint 2: seizure information

When treating patients with epilepsy as outpatients, determining seizure semiology and any changes to seizure frequency is essential. In case of a new patient, this information is necessary to diagnose or determine whether additional examinations are needed. In case of existing patients, the change of seizure frequency is important. Many factors affect seizure control [3]; thus, if seizure frequency has increased, clinicians should consider every factor that could have caused this loss of control over the seizures. Clinicians should also consider that the increased seizures may affect the general status of the patients, including immune system status [4].

The occurrence of new types of seizures would indicate acute symptomatic seizures due to the onset of new diseases, including COVID-19 [5]. Even for patients with epilepsy as a chronic neurological disorder, new types of seizures should be distinguished from the original seizures and examined in detail. However, some patients and their families are unable accurately recognize different types of seizures taking place. This creates difficulty in distinguishing new types from the original

seizures when only interviews are used in an outpatient setting. Capturing video would be helpful in such situations. Recent studies have shown the utility of smartphones or applications to record the seizures [6]. These devices help clinicians distinguish new types of seizures from original ones, even via telemedicine. The applications for epilepsy also assist by providing a summary of medication compliance, seizure frequency, daily routine, date and time of seizure onset, and by recording the seizures [6]. Therefore, especially in telemedicine, such applications assist clinicians in recording this information from patients.

2.3. Checkpoint 3: medications for epilepsy

Shortage of antiepileptic drugs (AEDs) is one of the greatest fears among both clinicians and patients during the COVID-19 crisis. It is essential to pay attention to the amount of medication directly available to the patient in case of a situation where the patient must self-isolate due to SARS-CoV-2 infection. Therefore, some societies have recommended the prescription of 90-day supplies of epilepsy medication during this crisis [7].

To maintain control of the seizures, medication compliance is very important. During the COVID-19 crisis, many lifestyles are required to change. These changes could cause decreasing medication compliance [8]. As above, to maintain medication compliance, introducing an application for patients with epilepsy may be beneficial. Other methods of maintaining medication compliance is to simplify the prescriptions of medications. Reducing the number of AEDs or the frequency of taking the medications may be helpful methods for maintaining medication compliance [8]. Some patients require many medications due to other medical conditions in addition to AEDs. Providing reminders to accurately take multiple medications could decrease patient stress during the outbreak.

In terms of prevention or supportive therapy for COVID-19, patients with epilepsy may be exposed to many supplements or new medications. As reported, some antiviral therapies that have been tested as treatments for COVID-19 have interactions with AEDs [7]. Therefore, clinicians should consider changing the AEDs to those with fewer interactions with antiviral medications, such as levetiracetam [7]. For telemedicine, it is also essential to confirm whether the patients have any symptoms associated with side effects of AEDs.

Patients could be exposed to SARS-CoV-2 when visiting medical institutions amid the crisis. To reduce the number of patients unnecessarily visiting medical institutions, it is important to prescribe suitable medications for controlling seizures.

2.4. Checkpoint 4: other treatments for epilepsy

Some patients with epilepsy utilize diet therapy to control seizures. Diet therapy efficiency is reduced under the COVID-19 crisis because of difficulty in obtaining the necessary foods [9]. Therefore, clinicians should confirm compliance to diet therapy via telemedicine. Clinicians and dietitians should guide the management for patients and their families [10].

Patients who underwent epilepsy surgery related to devices, such as vagus nerve stimulation, deep brain stimulation, or responsive

Checklist of telemedicine for clinicians

1. **General information (for new patients)**
 - Clinical history
 - Family history
 - Medical history
 - Birth and developmental history
 - Physical and neurological findings
2. **Seizure information**
 - Frequency of seizures
 - Occurrence of new types of seizures
 - Seizure semiology
 - Capturing the seizure on video
 - Suggesting using an application to summarize information regarding epilepsy
3. **Medications for epilepsy**
 - Confirming the sufficiency or shortage of medications
 - Check medication compliance
 - Try to simplify medications
 - Try to change AEDs to those with fewer interactions
 - Check symptoms associated with side-effects of AEDs
 - Try to prescribe rescue medications for seizures
4. **Other treatments for epilepsy**
 - Confirming the compliance of diet-therapy
 - Difficulty in obtaining food or drink necessary for diet-therapy
 - Confirming the sick-day management for patients with diet-therapy
 - Presence of problems with devices related to the control of epilepsy (VNS, DBS, or RNS)
5. **Patient general states**
 - Any symptoms of suspected COVID-19
 - Guiding the management of fever
 - Check compliance with recommendations of CDC associated with COVID-19
 - Presence of companion drugs or supplements
 - Presence of family or housemates with symptoms of suspected COVID-19
6. **Patient lifestyles**
 - Daily routine
 - Advise not drinking alcohol to control epilepsy
 - Advise not smoking or stopping smoking
 - Confirm mental states
 - Advise moderate exercise
7. **Considerations for specific patients**
 - Confirm the sufficiency of medical resources for patients who require medical procedures at home
 - Announce systems for patients who live alone
 - Consideration of specific communication for patients who are blind or have bradyacusia
 - Consideration of non-video calls for patients who do not have access to video calling
 - Prescriptions of or advice to take folic acid for women of childbearing age
 - Listen to patient anxiety
8. **Guidance on when a patient should attend a medical institution in person**
 - Guide when and how patients should attend a clinic
 - Guide when and how patients should attend ER

Fig. 1. A checklist for clinicians to assist in the introduction of telemedicine for patients with epilepsy. AEDs: antiepileptic drugs; CDC: Centers for Disease Control and Prevention; COVID-19: coronavirus disease 2019; DBS: deep brain stimulation; ER: emergency room; RNS: responsive neurostimulation; VNS: vagus nerve stimulation.

neurostimulation, require specific attention for their devices. These devices may be difficult to repair or adjust during an emergency. Therefore, during each telemedicine session for patients with devices, clinicians should assess the devices [11].

2.5. Checkpoint 5: patient general states

For every person, compliance to the recommendations of the Centers for Disease Control and Prevention is required and is particularly important for patients with epilepsy. At present, epilepsy is not considered a risk factor for developing SARS-CoV-2 infection [7]; however, any person can be infected. Therefore, clinicians should ask patients with epilepsy whether they have any symptoms of suspected COVID-19. In particular, some patients with epilepsy have risk factors for developing COVID-19 (such as smoking, obesity, diabetes, heart disease, lung disease, and cancer) [12,13]. Among the symptoms of COVID-19, fever should be paid attention to because it would decrease the threshold of seizures [14]. Clinicians should guide the management of fever for patients via telemedicine. If required by patients, clinicians should consider prescribing antifebrile medications. In particular, for patients with Dravet syndrome, the management of fever is critical [15]. Dravet Syndrome UK have stated that it is beneficial to use paracetamol when patients with Dravet syndrome have a fever [16].

As above, patients may take some supplements or medications temporarily to prevent or overcome COVID-19. Considering the interactions between AEDs and other medications, clinicians should assess any new medications or supplements taken by the patients temporarily.

Clinicians should also pay attention to the presence of household members who have symptoms of suspected COVID-19. In cases where

the patient is living with house members with suspected COVID-19 symptoms, they should be isolated from these members.

2.6. Checkpoint 6: patient lifestyles

Many people, including patients with epilepsy, are required to stay home and change their lifestyles as a result of COVID-19. These changes affect the control of the seizures in terms of lack of sleep, decreased medication compliance, change in diet, and stressful/anxious situations. Clinicians are advised to keep the patients' daily routine to control seizures.

Drinking alcohol is also known to trigger seizures for patients with epilepsy. It is widely known that people in stressful situations tend to drink more alcohol [17]. Clinicians are required to communicate the role of alcohol in epilepsy and recommend moderate drinking. Some studies have shown that smoking is also a risk factor for developing COVID-19 [12,13]. Therefore, patients who smoke should be advised to stop.

Coronavirus disease 2019 presents stressful situations to people worldwide. Patients with epilepsy are reported to have as much stress as those without epilepsy during the COVID-19 crisis [18]. Clinicians should take into consideration aspects of mental health for patients. If patients develop depression, AEDs could be changed as some can induce depression [19]. Moderate exercise also decreases the feeling of depression and has a positive effect on not only mental but also physical status.

2.7. Checkpoint 7: considerations for specific patients

Some patients with epilepsy require medical procedures at home. Obtaining some medical resources could be difficult because of the effects of COVID-19. Clinicians should confirm the sufficiency of medical

resources for such patients and, if needed, secure and supply the resources for their patients.

Social distancing or stay at home orders promote isolation in people who live alone. Patients with epilepsy who live alone are recommended to keep in contact with someone to inform them of their seizure control, medication compliance, and safety [7]. Applications for detecting seizures and alerting others to them would be helpful to keep patients who live alone safe [20].

When treating patients via telemedicine, additional considerations are required for patients who are blind or have bradyacusia. Subtitles or text would be helpful for those with bradyacusia. Since visual information is not available for those who are blind, clinicians can audibly share descriptive information for these patients.

Some patients are unable to use a video-call system for a variety of reasons, such as difficulties accessing the internet, location, or financial ability. Telemedicine should support such individuals. Alternative plans, such as phone calls or messaging, should be available for them. However, in these cases, systems must be established that ensure the person communicating is the expected patient.

Women of childbearing age taking AEDs, especially valproic acid, are recommended to take folic acid to reduce teratogenicity [21]. The needs for family planning services may be heightened because of various environmental changes in response to the pandemic [22].

Patients with epilepsy are more anxious during this crisis than those without [18]. Considering these backgrounds, we should assess their anxiety, stress, and difficulty in adapting to the present situation. Promoting to share accurate information regarding COVID-19 could reduce patient anxiety [23].

2.8. Checkpoint 8: assessing when patients should attend a medical institution in person

Via telemedicine, patients should be guided as to when and how they should attend a medical institution in person. During the COVID-19 crisis, attending a medical institution comes with a risk of exposure to SARS-CoV-2 for patients. Therefore, to reduce unnecessary exposure, patients should be informed for the appropriate time to come to the clinic. There is no consensus about when the patients with telemedicine should physically come to the clinic. Clinicians should decide it for each patient. When they attend a clinic, proper measures should be strictly imposed, such as patient segregation at the entrance and exit, a set time to prevent contact with other patients, and wearing of masks when attending. Prior to attending, it should also be confirmed whether they have any symptoms of suspected COVID-19. In cases where symptoms of COVID-19 are present, they should attend medical institutions equipped for COVID-19 testing and treatment. It should be emphasized that patients must call prior to attending any medical institution [7]. We should also inform the patients when they should go to the emergency room.

3. Conclusion

This article summarizes the checkpoints of telemedicine for patients with epilepsy during the COVID-19 crisis. Epileptologists are required to manage their outpatients using telemedicine because of the COVID-19 pandemic. This checklist will be helpful for epileptologists introducing telemedicine to their practice.

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Declaration of competing interest

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