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The Impact of Corona Virus Disease-2019 on Outpatient Neurology

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Abstract

In December 2019, unexplained cases of pneumonia emerged in Wuhan, China, which were found to be secondary to the novel coronavirus SARS-CoV-2. On March 11, 2020, the WHO declared the Coronavirus Disease 2019 (COVID-2019) outbreak, a pandemic. Neurological complications of COVID-19 are not uncommon. Neurologists are used to uncertainty; they were able to adapt to the rapidly evolving changes while fighting this pandemic. Despite the negative impact of COVID-19 pandemic on nearly all medical specialties and Neurology is no exception, it has served as a catalyst in advancing a tool that has long been struggling to thrive, telemedicine.

Keywords: Coronavirus disease; Neurology; COVID-19

Introduction

Since the first case of Coronavirus Disease 2019 (COVID-19) pneumonia was documented, reports of involvement of nearly every organ system have been published. The full spectrum of COVID-19 infection is not fully described yet. Some patients may have no clinical symptoms at all, while others might suffer from severe disease and even die. [1,2] The respiratory tract is not the sole target of this virus. In an analysis of 214 cases of COVID-19 in Wuhan, China, 78 (36.4%) had neurological complications. The current pandemic has affected Neurology practice on multiple levels. The goal of this review is to outline the broad spectrum of the neurological consequences of COVID-19 on the practical basis at outpatient settings.

Literature Review

The current pandemic has affected Neurology practice on multiple levels. Some of the impact is related to the patient population, many of which are chronically ill and on immunosuppressive agents [3]. It has also created a negative impact on the performance of diagnostic and therapeutic procedures [4,5].

Following the recommendations of the CDC and the Centers for Medicare and Medicaid Services of prioritizing urgent and emergent visits and procedures, scheduling procedures and diagnostic studies have been affected [6,7]. Kassardjian *et al.*, on behalf of the American Association of Neuromuscular & Electrodiagnostic Medicine (AANEM), have addressed the utilization of electrodiagnostic studies by creating a concise practical guideline [5]. They recommend avoiding any outpatient procedure unless it is urgent, and the consequences would be detrimental if not performed in a timely manner. However, determination of the degree of urgency of an EMG procedure (or lack thereof) clearly requires a case-by-case review. Telehealth could be used to make this decision. It can also be used to provide reassurance if a study is postponed [5]. As for the inpatient setting, they also recommend avoiding any study unless it is urgent and would significantly alter management [5]. Even when performing essential procedures, physicians and technicians should practice the highest levels of precautions. This includes deployment of appropriate personal protective equipment, proper hand and equipment cleaning, and limiting unnecessary equipment and personnel during patient testing [5].

Discussion

Patients with chronic neurological conditions have been impacted by COVID-19 as well. So far, we do not have clear evidence that Parkinson's patients have worse outcome if

infected by COVID-19 [8]. However, most movement disorders patients are older with comorbidities which place them at a higher risk [3]. The pandemic has caused a cascade of rapid and drastic changes in lifestyle. Patients with cognitive decline are less likely to be able to adapt to these changes [3]. Moreover, the recommendations for social distancing will affect the way of life for these patients [3]. Fortunately, no reports on shortages of medication supply and availability have been documented [8]. Neurologists should be vigilant for detecting the direct and indirect impacts of this pandemic on their chronic patients.

According to Wang H et al. COVID-19 might also worsen the symptoms of dementia [9]. First, COVID-19 pneumonia can cause hypoxia leading to delirium. Secondly, older people in many countries, including those with dementia, tend to live alone or with their spouse. They may have limited knowledge or comfort using telecommunication resources, and therefore depend mostly on in-person support. This limitation, along with the requirements for social distancing, result in loss of regular contact with family members, which in turn leads to withdrawal and feelings of loneliness and abandonment. Therefore, for patients with dementia, it is of paramount importance not only to emphasize personal protective measures to reduce the risk of viral infection, but also to provide psychosocial support for the patients and their caregivers [9].

Patients with migraine and other disabling headache disorders are particularly vulnerable during the COVID-19. The mental stressors, anxiety and routine changes can be triggering factors [10]. Clinicians are working on keeping these individuals out of the emergency, or at least minimizing face-to-face contact. To maintain appropriate level of medical care while protecting our patients, telehealth is becoming mainstream in headache management. As compared to in-person headache care, telemedicine is cost-effective, and many investigations demonstrated its non-inferiority in the treatment of headache and other neurological disorders [10].

Immunosuppressed patients are at higher risk of developing opportunistic infections. After an analysis of 1560 COVID-19 patients, Guan et al. demonstrated a clear correlation between the number of comorbidities, including malignancy and immunodeficiencies, and poor outcomes [11]. It is also well documented that patients with Multiple Sclerosis (MS) have higher infection-related healthcare utilization [12]. Yet, it is unclear whether patients with MS or Neuromyelitis Optica Spectrum Disorder (NMOSD) have higher risk of contracting COVID-19 infection or developing complications [13]. An association of COVID-19 triggering a relapse in NMOSD hasn't been established [14].

According to a recent guideline published by the National Multiple Sclerosis society [15], some immunomodulators such as interferons, glatiramer, and natalizumab, are unlikely to increase the risk of COVID-19 infection, while other modulators such as dimethyl fumarate, and immunosuppressant drugs such as ocrelizumab and alemtuzumab, may increase that risk [15]. Interestingly, tocilizumab (an IL-6 inhibitor) and eculizumab (anti

complement protein C5), both used for treatment of NMOSD, are currently being investigated as treatment options for COVID-19 [14].

For MS patients who are receiving disease modifying therapy (DMT), the benefits of continuing DMTs outweighs the risks in most patients [13]. The National MS Society recommends in general continuing DMT during the COVID-19 pandemic. [15] Brownlee et al. recommended continuing treatment in cases with mild COVID-19 infection, whereas for those patients on treatment with substantial immunosuppressive effect, or hospitalized due to severe COVID-19 infection with worsening symptoms, neurologists should have lower threshold for stopping DMTs. Treatment can be resumed after four weeks or after symptom resolution [13]. However, these recommendations need to be individualized and discussed after assessment of risks and benefits [15].

Although we do not have clear data on the topic, there are conceptual concerns about severe COVID-19 complications in patients with myasthenia gravis (MG)/Lambert-Eaton myasthenic syndrome (LEMS) who receive immunosuppressive therapies, either due to the respiratory muscle weakness occurring in those disorders, or due to the treatments themselves [16]. Similar to MS/NMOSD, the recommendations are to continue immunosuppressive treatment in general. The decision to stop treatment should be individualized [16]. Jacob et al. has created a guide for management of MG/LEMS patients during the COVID-19 pandemic which gives an important insight when making these decisions. It considers factors related to patient, disease severity and the immunosuppressive agent [16]. Further studies are certainly needed in this regard.

Despite the enormous negative impact of the current pandemic of COVID-19 on society and Neurology, it has served as a catalyst in advancing a tool that has long been struggling to thrive, telemedicine. The pandemic has forced health care personnel of all specialties to adapt to a new clinical reality, and neurology is no exception [10]. Telemedicine has been practiced for over a decade in the United States [10,17]. Stroke neurologists have made remarkable strides in stroke care via telehealth with equally effective care and results to face-to-face encounters [18]. It shows similar satisfaction rates and outcomes [10]. Patients perceive it to be cost-effective and convenient [10]. Telemedicine has been validated for assessing MS patients and Parkinson's patients [19]. Even a practical step-by-step guide on how to implement telemedicine for a movement disorders clinic is available online [20]. Yet, the implementation of teleneurology is challenged by laws, regulations and policies at state and federal level in the United States. According to Klein et al. there is an urgent need for neurologists to stay tuned in with the current understanding of local and federal laws, regulations, coding and reimbursement options concerning incorporating telehealth in practice [17].

The implementation of telehealth will also reduce health care cost and will provide an economical benefit to ensure sustainability of practices and institutions of different sizes [21]. It has a measurable impact on public health and delivery of care, especially in the low-resources settings [21].

Therefore, we believe that neurologists should use the current momentum to support the continuation of this trend in practice. Telemedicine shall no longer be considered as a last resort in crisis time. With the evolving nature of the practice of neurology, achieving competence in utilizing telemedicine should be stressed more as a part of the educational curricula for residency and fellowship programs.

Conclusion

Telemedicine is an essential tool in practicing clinical neurology and is a necessary skill during the current pandemic of COVID-19. This experience may generate a long-lasting post-pandemic impact on the practice of neurology, even at the residency and fellowship training level.

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