



Virtual visits for chronic neurologic disorders during COVID-19 pandemic

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Abstract

Background COVID-19 pandemic has boosted telemedicine in medical clinical practice. Experiences in the management of chronic neurological disorders are limited and scattered. The aim of the study was to evaluate feasibility and efficacy of virtual visit for chronic neurological disorders during COVID-19 pandemic.

Methods All patients scheduled for a visit during the lockdown period were contacted. The patients fell into four categories: (1) long-term follow-up, the patient was re-scheduled; (2) visit was necessary, teleconsultation was accepted; (3) problem was solved by phone call; and (4) visit was necessary and teleconsultation was not feasible, then visit was maintained. Google Meet was used. During the virtual visit, neurological examination was performed, and demographic and clinical characteristics were recorded.

Results At the end of May 2020, 184 virtual visits for 178 patients were performed for the following diseases: myasthenia gravis (47 patients), multiple sclerosis (79), epilepsy (12), headache (6), and parkinsonism (34). The patients were 70 males and 108 females with a mean age of 53.5 years (range 13–90). During virtual visit, we were able to obtain a satisfactory neurological examination.

Conclusions We demonstrated feasibility and effectiveness of virtual visit in the management of a large group of patients with common chronic neurological disorders.

Keywords Telemedicine · Neurology · COVID-19 · Continuity of care · Chronic neurologic disorders

Introduction

COVID-19 pandemic and restriction to people mobility for safety reasons has boosted telemedicine in medical clinical practice. Telemedicine has been used in neurology mainly as telestroke [1, 2] to bring thrombolysis in rural and underserved areas. Experiences in the management of chronic neurological disorders, before pandemic, were limited and scattered [3], and even during COVID-19 pandemic, very few studies have been conducted [4, 5] with different modalities or on single

disorder [6–12]. Mobility restriction aimed to protect fragile people who are especially patients with chronic neurological disorders, but raised the risk to neglect the care of such conditions, inducing secondary health problems. An ISS (Health Superior Institute) report [13] on rare diseases revealed that 46% of survey respondents complained about continuity of care due to outpatient activity reduction with symptom worsening, sense of abandonment, and anxiety.

The aim of the study was to evaluate feasibility and efficacy of virtual visit for chronic neurological disorders during lockdown due to COVID-19 pandemic, in order to maintain regular follow-up for the neurological condition, to treat emerging disturbances, and to keep in touch with patients reducing the sense of abandonment and ensuring continuity of care. This study was conducted in a real-life cohort of consecutive patients selected only by the period of the scheduled evaluation.

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Materials and methods

All patients scheduled for a visit during the lockdown period (from March 10th to May 15th) were phone contacted. The aim of the visit was analyzed, and the patients were divided into four categories: (1) long-term follow-up and stable disease, the patient was re-scheduled; (2) visit was necessary, teleconsultation was proposed and accepted; (3) health problem was solved by phone call (mainly exams evaluation); and (4) visit was necessary and teleconsultation was not feasible, traditional visit was maintained. The case manager scheduled the appointment and collected any useful documentation. Google Meet was used on desktop or laptop for the clinician and via desktop, laptop, tablet, or smartphone for the patient. A user guide for Google Meet was sent to the patient before the visit when necessary. During the virtual visit, neurological examination was performed, adapted to the particular setting as suggested elsewhere [3]. We recorded demographic and clinical characteristics of the patients.

Results

A total of 711 patients were scheduled in the lockdown period. Of these 195 (27.4%) patients were stable, or long-term follow-up and visit was rescheduled or canceled by the patient. In these cases, telemedicine was not proposed. For 160 patients (22.5%), a phone call or a remote check of blood or neuroradiological exams were conclusive, and for 194 patients (27.3%), a visit was necessary but the patient could not attend teleconsultation and was traditionally evaluated. The distribution of teleconsultations in different diseases is shown in Table 1. Teleconsultations were more frequently performed in myasthenia gravis and multiple sclerosis (around 30% of the total visits), while it was less frequently performed for parkinsonism or epilepsy. In this latter, around 37% of the cases were solved by phone or exams evaluation. Very few visits were performed for headache due to lack of a clear reimbursement modality. About the 194 traditional visit

performed, only 31 (16%) were due to refusal of televisit for technical problems or lack of trust in this modality. The reasons to maintain the other 163 traditional face-to-face visit were highly variable such as medical problems, infusion therapies for multiple sclerosis and myasthenia gravis, botulinum toxin and lack of a clear reimbursement modality for headache, concomitant EEG for epilepsy, or lack of confidence of the neurologist with this new modality. At the end of May, 178 patients and 184 teleconsultations were performed (6 patients had two teleconsultations) for the following diseases: 47 for myasthenia gravis (17 males, 30 females; mean age 55 years, range 13–84 years), 79 with multiple sclerosis (26 males, 53 females; mean age 43 years, range 17–76 years), 12 with epilepsy (3 males, 9 females; mean age 53 years, range 16–83 years), 6 with headache (3 males, 3 females; mean age 46 years, range 17–67 years), and 34 with parkinsonism (21 males, 13 females; mean age 73 years, range 54–90 years). The distribution of age for all the teleconsultations is shown in Fig. 1. During virtual visit, we were able to obtain a satisfactory neurological examination with or without the support of a caregiver (44 versus 134, respectively, 25% of the total). Caregiver was necessary in 26 out of 34 patients with parkinsonism (76%), in 6 out of 12 patients with epilepsy (50%), 9 out of 47 patients with myasthenia gravis (19%), and in only 3 cases out of 79 patients with multiple sclerosis (4%). None of the patients with headache needed a caregiver.

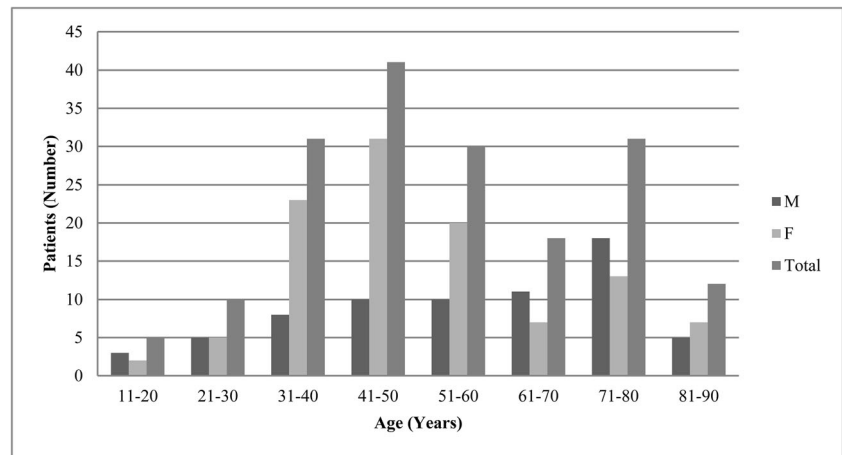
Discussion

Chronic neurological disorders are an important part of neurologists' clinical practice. These patients need regular controls not only to perform neurological examination but also to check blood or neuroradiological exams or to tailor different treatments. We have shown feasibility and effectiveness of virtual visit in the management of a large group of patients with different common chronic neurological disorders (multiple sclerosis, epilepsy, myasthenia, parkinsonism, headache) with a wide span of age even if with caregiver support for

Table 1 Modalities of scheduled visit management

From March 10th to May 15th	Total visits scheduled	Canceled by patient or rescheduled	Televisit	Phone call or exams evaluation	Face-to-face visit
Multiple sclerosis	227	72 (31.7%)	76 (33.5%)	29 (12.8%)	50 (22%)
Epilepsy	108	24 (22.2%)	12 (11.1%)	40 (37%)	32 (29.6%)
Myasthenia gravis	107	40 (37.4%)	36 (33.6%)	11 (10.3%)	20 (18.7%)
Parkinsonism	179	43 (24%)	32 (17.9%)	58 (32.4%)	46 (25.7%)
Headache	90	16 (17.8%)	6 (6.7%)	22 (24.4%)	46 (51.1%)
Total	711	195 (27.4%)	162 (22.8%)	160 (22.5%)	194 (27.3%)

Fig. 1 Distribution of teleconsultations through different classes of age



older patients. The number of teleconsultations performed with caregiver was highly variable across the different diseases ranging from 0 in headache to 76% in parkinsonism with a mean of 25%. We can conclude that caregiver has an impact in the feasibility of teleconsultations higher than the lack of technology. Virtual visits may account for an important part of outpatient activity (22.8% of total visits), and together with phone call or remote check of documentation, around 50% of in presence visit can be avoided. This is similar to the reduction of face-to-face consultations through an e-consult with the primary care physician [14]. This is a surprisingly good starting point. The amount of teleconsultation lost for technical or trust reasons is very small (16%). We can imagine that a further improvement of digitalization could influence more the quality of the service than the volume of the activity. Surely, telemedicine can be a useful tool when combined with traditional face-to-face follow-up visits. In this scenario, setting and aims should be clarified and further studies are needed to define how to include these new modalities in the long-term management of chronic neurological disorders. During pandemic telemedicine allowed the continuity of care with the referring physician. The study is a real-life cohort of consecutive patients, single-center based, and transversal to multiple pathologies. Furthermore, it includes patients with myasthenia, for whom data about telemedicine are particularly scarce [15]. A limit of the study is the sample size that has been reduced for difficult access to technology for some patients and the duration of lockdown.

Conclusions

In this real-life cohort of consecutive patients, we have shown that virtual visits are feasible and effective in the management of a large group of patients with different common chronic neurological disorders even in older age and may account for around 50% of outpatient activity. The presence of a caregiver is fundamental particularly for some disease such as

parkinsonism. The lack of technology accounts only for a little loss of visits. It is mandatory to define how to insert teleconsultations with traditional face-to-face consultations in the long-term management of chronic neurological disorders. Further studies are in progress to enlarge the cohort, to perform a standardized neurological evaluation, and to define setting and aims for this new promising health technology and its implementation outside the COVID-19 pandemic scenario.

Author contribution RI, PF, and BMD designed and developed the study. RI, BMD, VM, PA, GSV, GF, GA, FM, TA, VR, and RMT collected data. All authors revised and reviewed the manuscript for content.

Data availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical publication statement We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

Ethical approval None.

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