

Tele-Child-Neurology in the Era of COVID-19: A Developing Nations' Perspective

Since the first official report of the coronavirus disease-19 (COVID-19) from China in December 2019, the contagion has hit the shores of several countries and has evolved as a global pandemic.^[1] The rapid pace of progression of the pandemic has forced many nations to institute strict containment measures such as social distancing, lockdowns, and so on.^[2] The current situation demands minimization of the face-to-face consultations and restriction of the regular planned hospital visits and this has become a strong advisory as a part of the epidemic control measures.^[2] The complete halt of public transport, the transformation of multiple public and private-sector hospitals into COVID-19 care centers, and diversion of resources for pandemic control measures have left the needs of patients with chronic disorders largely unattended. Similarly, chronic conditions in pediatric neurology need continuity of care. These include epilepsies, developmental delays, movement disorders, neurometabolic disorders (for ensuring dietary compliance), autoimmune disorders (requiring prolonged immunosuppression), neuromuscular disorders, and so on. To maintain the steadiness of care, physicians around the globe have been trying to develop telemedicine services, which are still in an infantile stage in many countries. This paper intends to examine the potential of the emerging tele-child-neurology practices in meeting the brisk demands in developing countries during this pandemic.

Telemedicine refers to the delivery of health-care services to the patients using telecommunication technology, namely, telephones, smartphones, computers, tablets, and so on.^[3] It has been widely accepted and validated in terms of safety and

efficacy for both acute and chronic health-care delivery.^[4] The exceptional advantage of telemedicine lies in the maximization of the health-care benefits for people with limited accessibility to face-to-face consultations without any modification in any professional and ethical requirements.^[5] Besides, multiple trained experts can be consulted simultaneously during the session to avoid missing critical clinical events. Therefore, it may be acknowledged as a new game-changer tool in remodeling the old-fashioned physician–patient relations with changing times. Although it is still taking elementary steps in many countries, it has the potential to affect any medical specialty including child neurology.

Interestingly, telemedicine practices may be more flexible and better adapted to child neurology. Child neurology is a mix of knowledge, skillful history taking, meticulous observation and examination, pattern recognition, and extreme patience. Many diagnoses are made on history and clinical observation. Also, many a time, a detailed neurological examination is not even possible in children attending clinics because of poor patient cooperation. Thus, the child neurologists are already familiar with tackling the major challenge that is expected during teleconsultations, namely, lack of detailed physical examination. Even in day-to-day practice, in developing countries, many child neurologists zero down to correct diagnostic possibilities and guide pediatricians (when access is an issue for parents) after taking a proper telephonic history and observing a hallmark finding in an image or a video, namely, seizure semiology (such as epileptic spasms), movement disorders (such as infantile tremor syndrome,

opsoclonus myoclonus ataxia syndrome), evident clinical signs, and so on, and promptly advise various effective treatment options.^[6-8] Hence, it is obvious that the unrecognized intrinsic telemedicine practices have been well knitted with child neurology practice for years. Besides, high levels of caregiver satisfaction and a reduced number of defaulters have been documented with tele-child-neurology practice in clinical research studies.^[4,9] Institution of other allied telehealth services, namely, telepsychology, telerehabilitation, and so on, in children with neurological conditions may address the associated behavioral and psychological issues and further improve the quality of life.

With the advent of the COVID-19 pandemic, widespread implementation of the tele-child-neurology services is the need of the hour. However, the successful execution of this telemedicine on a large scale, especially in developing nations, is a major challenge considering the paucity of the standardized equipment and software applications compliant with strict patient privacy regulations, the expense involved in building infrastructure, issues with internet connectivity, lower level of literacy, understanding, and tech-savviness.^[3] Besides, the COVID-19 pandemic has struck without a warning, in absence of even minimal setup of tele-child neurology services. Other obstacles that need to be tackled include resource constraint, organizational issues, lack of expertise, and experience in managing patients using telemedicine (especially for young doctors), and so on. Also, there is a remote possibility of missing critical clinical events. This pandemic should be considered as an opportunity for the development of this much-needed setup.

Endorsing the popular mobile applications with the end-to-end encrypted facility like WhatsApp, Telegram, Viber, and so on, and smartphone devices may play a pivotal role in the initiation of tele-child-neurology practices in developing nations.^[8,10] Further, email providers such as Gmail, Yahoo mail, and so on may be used for sharing patient documents before telemedicine sessions for a better look. Several encrypted free screen sharing applications such as Wire, Crypho, and Team Viewer may be helpful to organize different clinical group discussions such as webinars and to disseminate the knowledge to the patients covering the aspects of domiciliary care of seizures, physiotherapy, and other rehabilitation modalities. Besides, a simple telephonic review by a clinician or a trained pediatric neurology nurse (under the guidance of clinician) may ensure conventional care in children with well-controlled epilepsy.^[9] Thus, continuous thrust for finding secure software applications and other tools to efficiently address and satisfy the patient's needs virtually is much needed to tide over the ongoing exceptional situation. Besides secure platforms, the enactment of legislation governing telemedicine practice in most developing nations to safeguard the interests of both doctors and patients is required. Standard operating procedures and disease-specific protocols need to be designed for telemedicine-based management. A two-step approach for patients requiring consultations with initial screening by a pediatrician followed by consultation by a child neurologist

may be helpful. Hopefully, tele-child-neurology will also help in the transition to routine outpatient services by staggering the huge number of care-seekers, thereby preventing sudden overwhelming of health-care services.

Tele-child-neurology, a tool of virtual health-care delivery to enhance accessibility, may play a vital role in handling the unanticipated challenging times such as the COVID-19 pandemic. Although face-to-face consultations remain the gold standard, telemedicine might be an effective substitute, especially in developing nations with a huge treatment gap.

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Chaithanya Reddy^a, Priyanka Madaan^a, Lokesh Saini

Pediatric Neurology Unit, Department of Pediatrics, Postgraduate Institute of Medical Education and Research, Chandigarh, India
^aCR and PM contributed equally and shared the first authorship.

Address for correspondence: Dr. Lokesh Saini,

Pediatric Neurology Unit, Department of Pediatrics, Postgraduate Institute of Medical Education and Research, Chandigarh 160012, India.
 E-mail: drlokeshsaini@gmail.com

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