

Telemedicine in Stroke Clinic during the COVID Era and the Challenges in Patient Management: Review Article

Sajid Iqbal¹, Aisha Hasan², Behzad Saeed Gill³, Anab Rehan Taseer⁴, Aimen Iqbal⁵, Muhammad Hanif⁶, Sohaib Tousif⁷, Ahmed Mohamed Abdelrhim Ellqany⁸, Fesih Muhammad Waseem³, Keron Akintola Ayodele Blair⁹, Anjli Tara¹⁰, Saif Ali Malik³, Zain Ghufuran Ul Haq⁷, Ahmed Mustafa¹¹, Tetiana Medvid¹², Nadeem Iqbal^{13*}

¹Department of Rehabilitation, PNS Hospital, Karachi, Pakistan

²Department of Medicine, Avicenna Medical College, Lahore, Pakistan

³Department of Medicine, Shifa International Hospital, Islamabad, Pakistan

⁴Department of Medicine, Khyber Medical College, Peshawar, Pakistan

⁵Department of Medicine, Bahria University Medical and Dental College, Karachi, Pakistan

⁶Department of Medicine, Hayatabad Medical Complex, Peshawar, Pakistan

⁷Department of Medicine, Ziauddin Medical University, Karachi, Pakistan

⁸Department of Medicine, Cairo University, Cairo, Egypt

⁹Department of Medicine, American International School of Medicine, Georgetown, Guyana

¹⁰Department of Medicine, Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan

¹¹Department of Medicine, FMH College of Medicine and Dentistry, Lahore, Pakistan

¹²Department of Medicine, Danylo Halytsky Lviv, National Medical University, Lviv, Ukraine

¹³Department of Urology and Kidney Transplant, Pakistan Kidney and Liver Institute, Lahore, Pakistan

Corresponding Author*

Nadeem Iqbal

Department of Urology and Kidney Transplant,
Pakistan Kidney and Liver Institute,
Lahore, Pakistan,
E-mail: dr_nadeemiqbal84@yahoo.com

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Abstract

The ongoing COVID-19 challenge has disrupted the social, economic and health care system around the globe. As a result of this pandemic, social distancing policies have been strictly implemented creating an immense stress on health care services. Telemedicine is an evolving and a time-saving, logical and effective means for emergency patient assessment. In far flung areas, where local consulting stroke specialist are not available, telemedicine can act as an alternative tool for provision of suitable stroke care within the short and safe therapeutic time window. Telemedicine has a precious role in emergency stroke consultation. Specialists have ability to swiftly evaluate and supervise management of stroke patients *via* telemedicine in coordination with the remote physicians at the distant health units.

Keywords: COVID-19 • Pandemic • Thrombectomy • Stroke clinic • Telemedicine clinic

Introduction

The ongoing COVID-19 challenge has affected social, economic and health care system around the globe. The COVID-19 pandemic has enormously impacted all specialty clinics also including neurology practices across the globe. As a result of this pandemic, social distancing policies have been strictly implemented creating an immense stress on

the world's economic affairs, governance, organizational functioning, and health care services. All this had resulted in cancellations of outdoor clinic visits, interventional procedures [1-3].

Keeping in view the safety concerns to health care workers and the patients alike, hospitals are desperately in search for coping with pressures of demand for medical supplies and physicians in the face of overburdened healthcare systems. New clinical pathways and tools are underway during this crisis to safeguard the health care personnel and patients [4-6].

From the genesis of the COVID-19 pandemic, stern social distancing steps; promoted the utilization of telemedicine. It has become a key tool to minimize the strain on clinicians and patients alike withstand the current challenges [6-9]. The Centers for Disease Control and Prevention has endorsed the concept of telemedicine in lieu of live clinic visits due to the anticipated uncertain duration of lock downs and social distancing [8-12].

Telemedicine can be defined as "the utilization of telecommunication technologies to dispense medical information and services" and "the exercise by which electronic, visual, and audio communications are used to furnish diagnostic and consultation pathways to reinforce clinicians at distant sites, assist in or directly deliver medical care to patients at distant sites, and enhance the skills and knowledge of distant medical care providers." In order to combat the disparity between rural and urban care and to promote enhance and optimize stroke services, Levine and Gorman mapped out the concept of outreach for acute stroke *via* telemedicine for appraisal and management and called it "tele stroke" [13,14].

Telemedicine is evolving as a timesaving, logical and effective means for emergency patient assessment. In far flung areas, where local consulting stroke specialist are not available, telemedicine can act as an alternative tool for provision of suitable stroke care within the short and safe therapeutic time window. The stroke specialists are suitable enough discourse queries regarding risk and benefits directly with the family right away. Telemedicine has a precious role in emergency stroke consultation. Specialists have ability to swiftly evaluate and supervise management of stroke patients *via* telemedicine with remote physicians at the distant health units [12-15].

We did search on PubMed, Medline database publications using: COVID-19, Stroke clinic, telemedicine clinic. The publications included were special communications, reviews, conferences papers, books and research studies regarding the subject matter over last one year.

Discussion

Amidst COVID-19 restrictions and social distancing measures, managing the triage, prudent utilization of staff, and systematic engagement of patient-physician is of paramount importance. Telemedicine has helped in averting the cancellation of outdoor patient visits in the developed advanced world during this pandemic. A telemedicine clinic serves different purposes such as tackling the triage acute problems, improvement of medications compliance by the patients, patients' reassurance, and timely follow-up of chronic conditions [12-16]. In the same way, tele consultations in stroke patients' management can help in quantification of patient's neurological deficits by a specialist as they can see stroke patients in the golden hours of symptom onset. Tele stroke aides in measurable identification of the patient's worsening signs and symptoms and in the provision of prompt feedback on management plans [15,16].

Despite being a promising tool, there are certain potential obstacles to the usage of telemedicine such as the initial fiscal requirements for equipment and training of staff with a steeper learning curve. There are challenges in ongoing training requirements in response to frequent changes in staffing. Regular refresher courses and intermittent orientation of new staff are important to maintain competencies in telemedicine. There are other additional issues of licensing requirements in each state or nation. In the US, a physician is required to be licensed in the state in which a patient seeks care. Thus, a telemedicine physician should acquire licensing in all states involved in the telemedicine network [14-17].

In a study by Rudilosso et al. it was found that there were significant reductions in stroke admissions and thrombectomies procedures at a Stroke Center during the current pandemic. They were of the view that overloaded emergency calls might have caused saturation of the patient transport system, resulting in reduction of Stroke Code activations. Patients might have felt more threatened by the COVID threat. They suggested to devise efficient patient transport systems, in-hospital contingency plans, and better education of public to better safeguard the patients suffering from acute stroke during these uncertain times [18].

Study by Teo et al. highlighted the possibility of hesitation on part of patients in seeking medical treatment for stroke symptoms during the current pandemic [19]. This may be ascribed to the fear of catching COVID-19 in hospital. All-around, every effort should be made for ensuring uncompromised stroke care during present situation. Some authors have advised centralized diversion to protected stroke centers. Public should be informed regarding such a system to take full advantage of treatable cases of stroke during this pandemic [20].

Some centers have tried to develop stroke-specific protocols that can be adhered to by other centers in in the management of stroke patient in the current pandemic. The commencement of tele stroke assessment of patients in the stroke clinic can be much helpful in screening suspected cases of stroke in the emergency department. However, in cases where detailed in-person assessment is required, before decision for thrombolysis, thrombectomy and eventual shifting to a dedicated stroke unit must be done with strict protocol of Protective Personal Equipment (PPE) in hospitals where there is high inflow of suspected COVID-19 cases. It is vital to note that in developing countries, there is lack of tele stroke clinics, shortage of trained stroke staff and limited finances to deal with demands of tele stroke clinic. Lack of rehabilitation team involvement in the follow up treatment of such cases is due to shortage of PPE or fear of exposure to infection [21,22].

Utilization of well-coordinated and inter connected tele clinic, mobile stroke units and dedicated stroke center via systems can be helpful in delivering remote specialist advice. Teleradiology is used to transmit high-resolution images and telestroke evaluation is done with the help of videoconferencing [23]. Hence, mobile stroke units can be of help regarding initial imaging and expert consultation smaller healthcare centers which

otherwise would not have this capability. Such mobile units with facilities of tele radiology transmit CT scan images to senior physicians at a major university hospital. There is another concept of hub-and-spoke model, wherein, specialist care is provided to patients at distant smaller health centers (spokes) by senior specialists of tertiary care centers (hubs) [24,25]. At hubs, various specialists including vascular neurologists, internal medicine specialists and acute stroke specialists are present to deliver timely tele stroke services [24-26]. After the initial management, Hubs further act as receiving center for patients who would require higher level of care. Such models have been found to be cost-effective and enhance the circle of area to deal with stroke patients in remote areas in an efficient and timely manner. Furthermore, they are deemed reliable and comparable to in-person assessment [25,26]. Additionally, the time to treatment decision and thrombolysis administration are comparable between on-board and telemedicine vascular neurologists [26]. Despite these innovations in stroke management, there are certain complexities involved in the management tasks on remote basis. Because, it requires parallel multitasking being carried out in precise coordination by several healthcare specialists inside the limited space of a mobile stroke unit. Future studies and modifications are needed to improve management of stroke and neurology emergency cases by utilization of tele stroke clinics and tele medicine clinics.

Conclusion

The exceptional situation brought by the COVID-19 pandemic led to disruption of health services in all specialties including neurology and stroke clinics. However, with the help of technological innovations, tele stroke clinics and mobile stroke units can be of utility to manage neurological emergencies and stroke patients in a timely manner despite the menace of current pandemic.

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