



BRIEF REVIEW OF THE ROLE OF TELEMEDICINE IN MANAGING POST COVID-19 COMPLICATIONS

Dr. Md. Mubasheer Ali*

Apollo Tele Health, 9th Floor, Krishe Sapphire, Madhapur, Hyderabad, Telangana, India *Corresponding Author

Dr. Ayesha Nazneen

Apollo Tele Health, 9th Floor, Krishe Sapphire, Madhapur, Hyderabad, Telangana, India

ABSTRACT

Telemedicine has been successful in proving its effectiveness and in overcoming the main barriers in managing long Covid-19 or post Covid-19 complications. Recognizing the necessity of Telemedicine, considering the current crisis both to address increased treatment needs and to prevent unnecessary in-person contact, Apollo Tele Health (ATH) has adopted an innovative way of Telemedicine in managing patients and helping them recover from post covid complications thus realizing the full potential of advancements in technology for high quality health care delivery. With the onset of Covid-19, ATH has proven to be an essential tool for prevention, diagnosis and treatment of COVID 19 and to mitigate the post covid complications. This has been possible by the use of information and communication technologies (ICT) for the exchange of valid health information. Burden on healthcare in India is eased by an integrated effort of the government and other private sector initiatives such as Apollo Tele Health. Telemedicine platform can be used effectively for managing post Covid-19 complications and health education on various risk factors of Covid-19.

KEYWORDS :**INTRODUCTION**

In India, the shortage of doctors is a challenge to cater healthcare needs of such a huge population, which further deprives them from equitable access of healthcare (Kumar & Pal, 2018). The covid-19 pandemic has added unprecedented burden on the existing healthcare system functioning.

To address the healthcare challenges of India, Apollo Tele Health (ATH) (About Us | Apollo TeleHealth, n.d.) has established itself on providing digital health solutions across India and globally in providing quality remote healthcare services. ATH is an esteemed partner with many key public health bodies and functionaries of India. With the onset of Covid-19, ATH has proven to be an essential tool for prevention, diagnosis and treatment of COVID 19 and to mitigate the post covid complications. This has been possible by the use of information and communication technologies (ICT) for the exchange of valid health information (Mahajan et al., 2020).

The pandemic demands for implementation of a holistic approach for management, follow up care and general well-being of all post COVID-19 recovering patients. In this context, Telehealth has provided a platform to the clinicians to continue deliver high-quality medical care to these patients. Government of India and Medical Council of India (MCI) have proactively taken multiple measures to slow down Covid-19 pandemic by releasing Telemedicine practice guidelines in March 2020 (Board of Governors - Indian Medical Council, 2020). World Health Organization (WHO) has recognized telemedicine for essential health services in strengthening the health systems response to COVID-19 policy (eHealth, 2010).

DISCUSSION

Post Covid Complications syndrome or long covid are a wide range of symptoms such as weakness, myalgia, dyspnea, and lack of appetite etc, lasting 1 week to 6 weeks after first being infected or can appear weeks after recovery (Greenhalgh et al., 2020). Post covid complications can occur in anyone who have recovered from COVID-19, completely asymptomatic or having mild, moderate, severe or critical symptoms. Some of the post covid complications are chronic fatigue syndrome, post covid onset diabetes, myocardial infarction, deep venous thrombosis, strokes, pulmonary complications, depression, anxiety, loss of appetite, myalgia and insomnia to name a few. Covid-19 is a potentially severe acute respiratory tract

infection caused by novel virus SARS-CoV2 spread through salivary droplets from oral cavity or nasal discharge when an infected person coughs, sneezes or sometimes talks. Latest research has established the fact that virus may be airborne, infected through micro droplets that remain suspended in the air for few hours in closed and barely ventilated spaces (CDC, n.d.).

Usually, recovery from any disease including Covid-19 is a painful and lengthy process and getting back to normalcy is even more difficult as it affects both physical and mental aspects of an individual (Monaghesh & Hajizadeh, 2020). The post-covid period after recovery is very important wherein apart from taking care of physical health, managing mental health of the patients with the help of psychological counselling is essentially required. Due to unique pathophysiology of Covid-19, the body takes its own time to heal and recover. Until then, the individual may need to receive expert clinical care and monitoring at home, which can be provided via Telemedicine.

Considering the post Covid-19 recovery complications, Telemedicine is ensuring a complete recovery from the disease, by building respiratory strength, and restoring physical and mental immunity of the patients. The cost-effective care and follow up support in the comfort and safety of the patient's home by the help of 360-degree care by trained and experienced specialist medical staff is one of the salient features of Apollo Tele Health.

The Telemedicine at Apollo Tele Health services provides an integrated holistic approach for managing patients with post covid complications (About Us | Apollo TeleHealth, n.d.). The patient with post covid complications has tele consultation sessions with a team of specialists such as internal medicine, neurologist, cardiologist, endocrinologist, psychologist, nutritionist and physiotherapist who advise accordingly with specific and general medical management and various other rehabilitation measures to help recover fully at homes, thus avoiding physical visits to hospitals and clinics which are already overburdened.

Through Telemedicine, specialists address challenges in post-covid onset diabetes management and the difficulty in effectively implementing lifestyle measures, particularly in regard to physical activity and exercise, by recommending

indoor exercise routines, yoga, and other innovative ways of increasing physical activity (Wicaksana et al., 2020). Speciality diabetes care delivered via Telemedicine is safe and is associated with time saving, cost saving, high appointment and follow up adherence rates, and high patient satisfaction. ATH integrates different types of uploaded objective and subjective data of interest in managing diabetes, including patient-collected physiological data, such as blood glucose levels, blood pressure and laboratory parameters such as hemoglobin A1c (A1C) or lipid levels. These parameters are seamlessly amalgamated with behavioral information, such as dietary intake, physical activity patterns, medication dosages, relevant history including subjective symptoms such as hypoglycemia accompanied with pertinent event data, such as hospital visits, hospitalizations, scheduled ophthalmology visits, vaccines, and necessary teleconsultation follow ups, thus helping immensely in managing preexisting diabetes and post covid onset diabetes without any hurdles.

With the help of psychological counselling and support, Telemedicine focuses on mental health. Patients receive doctor consultations and specialized care, including supervised physiotherapy sessions and fitness regimes. Immunity booster meal plans are offered with the use of an antibody titer test, and qualified dietitians conduct extensive tele-nutrition counselling sessions. The 24X7 helpline is also available with specialists ready round the clock to assist the patients with any emergencies.

Cardiovascular care delivery has been severely disrupted due to the Covid-19 pandemic. Patients with CVD and cardiometabolic factors have an increased risk for severity, morbidity and mortality with Covid-19 infection, mainly due to the abundance of ACE2 receptor within the circulatory system. As a result, prompt administration of cardiac care via Telemedicine has assisted in the modification of CVD risk factors in patients infected with covid 19, easing the burden and demand on hospitals. (Telehealth and Cardiovascular Disease Prevention: A Discussion of the Why and the How - American College of Cardiology, n.d.) Management of chronic non-communicable diseases necessitates regular interactions between specialists and patients in order to reinforce adherence to medical and lifestyle interventions and make necessary adjustments based on patient-provided self-monitoring data such as blood pressure and blood glucose readings. Tele medicine at ATH has established the fact that self-monitoring coupled with consultation, counselling, feedback, and education through tele medicine has resulted in clinically significant improvement of LDL, HbA1c and blood pressure, therefore reducing the risk of CVD.

Post covid stroke care has been implemented using Telemedicine for diagnosis of stroke and assessment of stroke severity, guidance from specialists/neurologists for providing emergency care, stabilizing patient and monitoring of the care, or referral for further management. Teleconsultations by specialists, physiotherapists and dietitians for acute neurological deficits/stroke has proven to be beneficial in helping family and caregivers through triaging and prompt referral to the nearest health care facility (Application of Telemedicine in the Management of Stroke 6.1 Scope and Purpose, n.d.).

Deep venous thrombosis (DVT) is diagnosed and managed by integrating history, physical examination, risk stratification, routine tests, and specialist teleconsultation. (Iyengar et al., 2020) Because Covid-19 is closely linked to hypercoagulability, inflammation and prothrombotic condition the risk of vascular sequelae such as DVT is higher in COVID 19 patients (Abou-Ismaïl et al., 2020). COVID-19-related coagulopathy is frequent in people with

cardiovascular risk factors such as hypertension and coronary artery disease. ATH approach has aided in the triage and assessment of patients suspected with DVT, as well as formulation of a care plan and rapid referral. Prompt and appropriate antithrombotic measures have helped prevent complications of DVT such as pulmonary embolism.

Myalgic encephalomyelitis also commonly referred to as chronic fatigue syndrome (CFS) is a disease entity of unknown etiology. Although clinical findings of the central and autonomic nervous systems, with the immune system, and energy metabolism have been linked together, neither the pathogenesis of CFS nor a diagnostic test with sufficient sensitivity and specificity have been established. In addition to fatigue, other criteria include post-exertional malaise, unrefreshing sleep, cognitive impairment, and orthostatic-related symptoms. Covid-19 appears to result in symptoms resembling that of CFS that outlast the initial acute illness. Given that CFS is a chronic condition, clinicians at ATH regularly assess whether the symptoms improve or worsen and update the treatment plan through telehealth. Because CFS is associated with so many other chronic disorders, the clinician may recommend the patient to a neurologist, physiotherapist, psychologist, or professional dietitian after an initial evaluation, depending on the symptoms. This could help with specific CFS symptoms that come under their expertise as well as uncover additional concomitant diseases that need to be treated (Weatherburn et al., 2007). Telehealth helps in carrying this referral process seamlessly without much time being consumed.

CONCLUSIONS

Telemedicine has conveniently become a completely unique tool for health care providers to reach out to patients to enhance the standard of health care during this pandemic. Telemedicine has been successful in proving its effectiveness and in overcoming the main barriers in managing long Covid or post Covid-19 complications. Recognizing the necessity of Telemedicine, considering the current crisis both to address increased treatment needs and to prevent unnecessary in-person contact, ATH has adopted an innovative way of Telemedicine in managing patients and helping them recover from post covid complications thus realizing the full potential of advancements in technology for high quality health care delivery. Telemedicine platform can be used effectively for managing post Covid-19 complications and health education on various risk factors. Burden on healthcare in India is eased by an integrated effort of the government and other private sector initiatives such as ATH by expanding use of telemedicine in the face of Covid-19 pandemic.

Financial Support And Sponsorship

Nil.

Conflicts Of Interest

There are no conflicts of interest.

REFERENCES

1. Abou-Ismaïl, M. Y., Diamond, A., Kapoor, S., Arifah, Y., & Nayak, L. (2020). The hypercoagulable state in COVID-19: Incidence, pathophysiology, and management. *Thrombosis Research*, 194, 101–115. <https://doi.org/10.1016/j.thromres.2020.06.029>
2. About Us | Apollo TeleHealth. (n.d.). Retrieved July 19, 2021, from <https://apollotelehealth.com/about-us/#vision-mission>
3. Application of Telemedicine in the Management of Stroke 6.1 Scope and Purpose. (n.d.).
4. Board of Governors - Indian Medical Council. (2020). In supersession of the Medical Council of India Telemedicine Practice Guidelines. Indian Medical Council, March.
5. CDC. (n.d.). Scientific Brief: SARS-CoV-2 Transmission. 2021. <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html>
6. eHealth, W. H. O. G. O. for. (2010). Telemedicine: opportunities and developments in Member States: report on the second global survey on eHealth. World Health Organization. <https://apps.who.int/iris/handle/10665/44497>
7. Greenhaigh, T., Knight, M., ACourt, C., Buxton, M., & Husain, L. (2020).

- Management of post-acute covid-19 in primary care. *The BMJ*, 370. <https://doi.org/10.1136/bmj.m3026>
8. Iyengar, K. P., Jain, V. K., Soni, M., & Hakim, Z. (2020). Virtual risk assessment pathway for deep venous thrombosis: A preliminary model. *Postgraduate Medical Journal*, 1–5. <https://doi.org/10.1136/postgradmedj-2020-138837>
 9. Kumar, R., & Pal, R. (2018). India achieves WHO recommended doctor population ratio: A call for paradigm shift in public health discourse! *Journal of Family Medicine and Primary Care*, 7(5), 841–844. https://doi.org/10.4103/jfmpc.jfmpc_218_18
 10. Mahajan, V., Singh, T., & Azad, C. (2020). Using Telemedicine During the COVID-19 Pandemic. *Indian Pediatrics*, 57(7), 652–657. <https://doi.org/10.1007/s13312-020-1894-7>
 11. Monaghesh, E., & Hajizadeh, A. (2020). The role of telehealth during COVID-19 outbreak: A systematic review based on current evidence. 4, 1–9. <https://doi.org/10.21203/rs.3.rs-23906/v1>
 12. Telehealth and Cardiovascular Disease Prevention: A Discussion of the Why and the How - American College of Cardiology. (n.d.). Retrieved July 19, 2021, from <https://www.acc.org/latest-in-cardiology/articles/2020/09/15/14/14/telehealth-and-cardiovascular-disease-prevention>
 13. Weatherburn, G. C., Lister, A. G., & Findley, L. J. (2007). The Feasibility of Reviewing Chronic Fatigue Syndrome Clients at a Distance. *Journal of Chronic Fatigue Syndrome*, 14(1), 23–32. https://doi.org/10.1300/J092v14n01_03
 14. Wicaksana, A. L., Hertanti, N. S., Ferdiana, A., & Pramono, R. B. (2020). Diabetes management and specific considerations for patients with diabetes during coronavirus diseases pandemic: A scoping review. *Diabetes & Metabolic Syndrome*, 14(5), 1109–1120. <https://doi.org/10.1016/j.dsx.2020.06.070>