



Commentary

Managing Cystic Fibrosis related diabetes via telehealth during COVID-19 pandemic

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ABSTRACT

Coronavirus disease 2019 (COVID-19) was declared a pandemic on March 11, 2020. In efforts to reduce the risk of transmission, telehealth visits for routine care has significantly increased in the United States. Cystic fibrosis patients have been categorized as a highly vulnerable population to COVID-19 infection. Cystic Fibrosis centers are rapidly assessing and responding to the pandemic to ensure the safety of CF patients. At our Cleveland Clinic Cystic Fibrosis center, we transitioned outpatient clinics to a virtual care model in March 2020. Here, we report the changes that were implemented to optimize diabetes management in CF patients through telehealth during the COVID-19 crisis.

The novel SARS-CoV-2 coronavirus (COVID-19) has become a global health crisis since its initial outbreak in Wuhan, China in December 2019. On January 30, 2020, the World Health Organization recognized the COVID-19 outbreak as a Public Health Emergency, and on March 11, 2020, it was declared as a pandemic.

Although all age groups have been affected by COVID-19, increased morbidity and mortality has been observed in the elderly and in patients with cardiovascular disease, diabetes, obesity, chronic lung disease, hypertension and malignancy. A large observational report focusing on the clinical characteristics of the affected patients with confirmed COVID-19 infection from China indicated that 173 patients with severe disease had comorbidities of COPD (3.5%) diabetes (16.2%) and hypertension (23.7%) [1].

Patients with respiratory conditions that impair or compromise lung function such as Cystic fibrosis (CF) are also at risk for COVID-19. Viral respiratory tract infections are typically more severe in patients with cystic fibrosis than in the general population. In 2009–2010, the H1N1 influenza pandemic resulted in significant morbidity in most people with CF who contracted the infection [2]. In addition, hyperglycemia due to uncontrolled CF related diabetes (CFRD) can adversely affect lung function and reduce life expectancy [3].

As of January 2021, 941 cases of COVID-19 have been identified in CF patients [4]. Of the positive cases, 142 were hospitalized, 2 deaths occurred in individuals with advanced lung disease, and 2 deaths

occurred in post lung transplantation recipients [4].

At our Cleveland Clinic CF center, we have a total of 5 cases of COVID-19, 4 of these occurred in post lung transplantation patients. Only one of these patient had CFRD. These relatively low number of COVID-19 infection at our CF center might be attributed to CF patients taking extraordinary precautions in terms of social distancing, infection control, as well as transition of care to telehealth model.

Since CFRD is the most common extra-pulmonary comorbidity of CF, optimal management is crucial to reduce the potential for worse outcomes in patients with CF during COVID-19 pandemic. We have developed these strategies for outpatient management of CFRD at our Cleveland Clinic CF Center:

Telehealth visits: We have expanded endocrinology telehealth services to all of our established and new CF patients. Virtual and phone visits are being offered to in state as well as out of state patients. Furthermore, we have also implemented telehealth visits for nutrition and diabetes education.

Several studies have supported the use of Telehealth for Diabetes management. A meta-analysis from China in 2014 showed a reduction in HbA1c by 0.37% ($p < 0.001$) in telemedicine group when compared to controls [5]. An Italian study, conducted during the COVID-19 pandemic, including 33 patients with Type 1 diabetes who shared their data with the diabetes outpatient clinic on a web-based cloud system (LibreView); an improvement in glycemic control was observed,

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despite the limited physical activity and the corresponding psychological stress of lock-down [6]. In another study from Los Angeles, US, telemedicine facilitated by Clarity Software and the “Share” feature with the use of Dexcom® G6 continuous glucose monitoring (CGM) was employed and became successful to manage high-risk patients with T1D [7].

In addition, CGM systems (Freestyle® Libre, DEXCOM® G6) are being widely used for CFRD management to optimize glycemic control and improve diabetes self-management at our CF center. This has increased patient awareness of glycemic trend as well as glycemic variability. Our current EMR also offers remote monitoring of these personal CGM devices, which enables the patients to download these data remotely and it becomes available for physician to review. Based on our interpretation of this data, our team has been able to make changes in insulin regimen remotely. Telemedicine and diabetes technology have enabled our diabetes team to provide ongoing care for many patients with CFRD. Ongoing efforts are needed to expand access to technology for diabetes management within the CF population.

Medication adherence: In addition to reinforcing the importance of adhering to insulin and monitoring glucoses, we have instructed patients to keep an emergency 30-day supply.

Diabetes sick day protocols: We have been routinely reviewing and discussing sick day protocol during endocrine and diabetes education telehealth visits.

Sharing of resources: During telehealth visits, we also take the opportunity to familiarize patients about the resources that are offered by The CF Foundation Compass (<https://www.cff.org/Assistance-Services/About-Compass/>), American Diabetes Association (<https://www.diabetes.org/coronavirus-covid-19>) and American Association of Clinical Endocrinology (<https://www.aace.com/trending-topics/patient-news-global-health/covid-19-and-diabetes>).

Work: The CF Foundation has recommended patients to work remotely whenever possible. In addition, the Foundation is also advocating the Congress to expand paid family and medical leave for CF patients.

Thus far, the incidence of COVID-19 is lower in CF than in general population [4]. We suspect that lower incidence of COVID-19 in the CF

population may be due to familiarity with social distancing, use of personal protective equipment, and the uptake of telehealth in the CF population. Ongoing studies on the benefits and limitations of Telehealth for CF and CFRD management, including post-pandemic, are needed.

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Declarations of interest

None.

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