DOI: 10.1002/ppul.25560

LETTER TO THE EDITOR

WILEY

Change in CF care during COVID-19 pandemic: Single-center experience in a middle-income setting

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Abstract

Introduction: The coronavirus 2019 (COVID-19) pandemic has demanded care changes for patients with chronic disease. Patients with cystic fibrosis (CF) are considered at higher risk of developing severe manifestations in the case of SARS-CoV-2 infection, and a need for new ways of safer care delivery has been required to avoid transmission.

Objectives: To assess the impact of the lockdown during the first wave of the COVID-19 pandemic and remote monitoring on patient's health status and daily maintenance therapy in a middle-income resource setting.

Methods: During the first wave of the pandemic period, we changed from regular clinic visits to telephone visit calls to monitor our patients' health condition and adherence to physiotherapy and physical exercise.

Results: A total of 120 patients or their caregivers have been contacted by telephone call visits over 10 weeks. During this period, 38 patients (28.33%) were identified to have pulmonary exacerbation; 89.5% were prescribed oral antibiotics, 3% were hospitalized to get iv antibiotics, and 8% of the patients presented other CF complications. Most of the patients did not change the frequency of the daily physiotherapy. Moreover, 71% of the patients who performed regular physical exercise changed the frequency and the type of exercise during the quarantine period. Interestingly, mean forced expiratory volume in 1 s and body weight increased significantly and after the lockdown period.

Conclusions: During the COVID-19 pandemic, the implementation of telephone contact processes aiming for CF patients' appropriate care is of great importance. Further studies are needed to evaluate patient outcomes when transitioning from face-to-face clinics to telemedicine clinics.

KEYWORDS
COVID-19, cystic fibrosis, monitoring, telemedicine, telephone visits

The coronavirus 2019 (COVID-19) pandemic has become a significant world health problem.[1] Many countries have recommended quarantine to decrease person-to-person transmission of COVID-19,[2] while most cystic fibrosis (CF) centers have advised their CF populations to isolate socially.[3] Traditionally, consistent follow-up care with frequent hospital visits is required to avoid a decline in pulmonary and nutritional health among CF patients. During the COVID-19 pandemic, many hospitals shifted their

workforces to the rapidly escalating numbers of COVID-19 admissions and halted routine clinical work, including outpatient services, to limit contamination and infection risks.[2] Thus emerged the paramount need to monitor chronic patients at home through virtual visits using telemedicine.[3]

To comply with the social distancing policy and follow up with our patients regularly, having at the same time a financial resources limitation, our CF center contacted all its patients via phone to monitor their clinical condition and health care needs during the first quarantine period. The aim of this study was to assess the impact of remote monitoring on patient's health status and daily maintenance therapy in a middle-income resource setting.

A prospective study was conducted among children and adults with CF from March 2020 until May 2020, now recognized as the pandemic's first wave. A CF nurse performed monthly telephone visit calls with our CF patients during the quarantine period. A questionnaire was used to collect information directly from the patients or their caregivers on their medical condition, change in respiratory and gastroenteric symptoms, current weight, fever, or any other complications/complaints; moreover, medication adherence, physiotherapy, and physical exercise were recorded. The multidisciplinary CF team (MDT) performed regular meetings to discuss the issues that were pointed out in the telephone calls. If required, antibiotics or bronchodilators were prescribed for a possible pulmonary exacerbation or a hospital visit, and possible admission was arranged. The study was approved by the "Hippokration Hospital of Thessaloniki" Ethics Committee. Informed consent was obtained from all the patients or guardians if the patients were under 18 years.

Descriptive statistics were used to analyze the study population. All parameters were described as mean and *SD*. Statistical analysis was performed using SPSS for Windows version 20.0 (SPSS Statistics 20, IBM Hellas Inc.).

We contacted 120 patients aged 1–30 years by telephone from March to May 2020. The mean (*SD*) time between the two onsite visits in the clinic (before and after the quarantine period) was 4.08 (1.53) months. The mean forced expiratory volume in 1 s (FEV1) %, measured over the two onsite visits in the clinic, increased significantly over the quarantine period (mean ΔFEV1; 95% confidence interval (COI) (3.19; 0.36–6.02), $p = .028$; the mean weight increased significantly; mean ΔWeight, kg; 95% COI (1.0; 0.61–1.4); $p < .0001$.

Several CF complications were reported. A total of 38 out of 120 patients (28.33%) were identified to have a possible pulmonary exacerbation, based on the increased respiratory symptoms, fever, anorexia, or weight loss; they were treated either with oral antibiotics (89.5%) or with IV antibiotics (3%). Moreover, two patients were diagnosed with distal intestinal obstruction syndrome; one was complicated with pneumothorax, one with hemoptysis, two with recent onset of pancreatic insufficiency, and one patient with new onset of cystic fibrosis–related diabetes (polyuria and weight loss were reported during the telephone call).

Before the lockdown, 79.5% of the patients reported performing physiotherapy daily, 8.2% reported performing physiotherapy 2–4 times per week, and 12.3% reported performing no physiotherapy at all. Most of the CF patients (88.5%) did not change the frequency of their daily physiotherapy practice during the COVID-19 pandemic (Table 1). Besides, before the pandemic, 49.2% of the CF patients performed extra assisted airway clearance by a physiotherapist that visited their home once a week through a home care program. During the study period, 71.2% of them discontinued this home-care program. Concerning physical exercise, before the COVID-19 pandemic, 97 (81%) of the CF patients were reported performing regular exercise weekly. During the pandemic, 72% of the patients changed the exercise type, while 71% reduced exercise frequency.

The current COVID-19 pandemic increased telemedicine's need to monitor patients with chronic diseases at home, prevent contamination, and disseminate COVID-19.[2] Close monitoring of the CF patients through regular telephone calls led to early detection and appropriate management of pulmonary exacerbations and CF complications. Early recognition and treatment of these episodes have an essential impact on the long-term decline in lung function, quality of life, and life expectancy.

The decline in FEV1 is typical of almost all patients with CF.[2] Interestingly there was an increase in FEV1 after the lockdown period, compared to the period before the COVID-19 pandemic, which might be explained by the fact that our patients had fewer chest infections, probably because of the low spread of viral infections due to the lockdown measures.[1] Home isolation with a low incidence of viral infections, less physical activity, and more ultra-processed food eating may also explain the weight gain over the quarantine period.

Physiotherapy is an essential component of CF care, including airway clearance and exercise; our patients were encouraged to follow self-physiotherapy programs and physical exercise to maintain their physical fitness. Due to social distancing measures, most families with CF patients have stopped the assisted physiotherapy home care program. Physical exercise forms an essential part of

TABLE 1 Impact of the COVID-19 pandemic on patients' daily airways clearance and physical activity

	Total subjects	No change in frequency	Less frequently	More frequently
Daily airways clearance	120	99/120 (82.5)	12 (10.0)	9 (7.5)
Assisted airways clearance	59	16 (27.1)	42 (71.2)	1 (1.7)
Daily physical activity	97	44 (45.4)	69 (71.1)	7 (7.2)

Note: Data are presented as numbers (percent).

Abbreviation: COVID-19, coronavirus 2019.

standard care for people with cystic fibrosis as it has multiple beneficial effects.[4] During the lockdown measures established over the coronavirus outbreak, gyms have been closed, and team sports activities have been halted. Although a significant percentage of our CF population had made physical exercise part of their everyday life, they had to change the exercise type during the lockdown days, and 71% of them reduced exercise frequency. Over these peculiar circumstances, we need to encourage them to participate in alternative exercise programs to maintain their fitness.

During the COVID-19 pandemic, there has been a change in CF care in most CF centers; virtual visits have replaced face-to-face onsite visits with the MDT. In our CF center, to adapt to the COVID-19 pandemic in a middle-income setting, the onsite visits were replaced by a telephone visit call based on a questionnaire. Close monitoring of the CF patients with a telephone visit program seems to be a cheap, simple, and easily applicable solution with significant beneficial health effects in children with chronic diseases in a middle resource setting over the COVID-19 pandemic. It may be a valuable tool to monitor the health status, possible exacerbations of the disease, complications, adherence to medication, physiotherapy, and exercise. Further studies are needed to evaluate patient outcomes when transitioning from face-to-face to telemedicine clinics.

ACKNOWLEDGMENTS

We would like to acknowledge all the patients and their families for agreeing to participate anonymously in this study; we would also like to acknowledge our CF nurse, Efrosyni Kalaitzidou, for contacting all the families and supporting them, especially during this period of social distancing.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

Elpis Hatziagorou: conceptualization (lead); data curation (lead); formal analysis (lead); investigation (lead); methodology (lead); project administration (lead); resources (lead); supervision (equal); validation (lead); visualization (lead); writing original draft (lead); writing review & editing (equal). **Ilektra Toulia**: data curation (equal); investigation (equal); writing original draft (equal); writing review & editing (equal). **Vasiliki Avramidou**: data curation (supporting); writing original draft (supporting). **Asterios Kampouras**: data curation (supporting); writing original draft (supporting). **Venetia Tsara**: writing original draft (supporting); writing review & editing (supporting). **John Tsanakas**: conceptualization (equal); data curation (equal); formal analysis (equal); investigation (equal); methodology (equal); project administration (equal); resources (lead); supervision (lead); validation (equal); visualization (lead); writing original draft (lead); writing review & editing (lead).

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How to cite this article: Hatziagorou E, Toulia I, Avramidou V, Kampouras A, Tsara V, Tsanakas J. Change in CF care during COVID-19 pandemic: single-center experience in a middle-income setting. *Pediatric Pulmonology*. 2021;56:3065-3067. https://doi.org/10.1002/ppul.25560