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Review Article

The Role of Telehealth in Paediatric and Paediatric Endocrine Health Care during the COVID-19 Era

Xenophon Sinopidis and Eirini Kostopoulou*

Department of Paediatrics, University General Hospital of Patras, Patras, Greece

***Corresponding Author:** Eirini Kostopoulou, Division of Pediatric Endocrinology and Diabetes, Department of Pediatrics, University General Hospital of Patras, Patras, Greece.

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Abstract

Background: The COVID-19 outbreak resulted in the implementation of self-protective and social distancing measures to prevent viral spread. As a result, the need for a shift from in-person to remote medical care was created. The aim of the present study is to present existing data regarding the advantages and compromises of the use of telehealth in the paediatric population.

Methods: A literature review was conducted regarding the use of telehealth in children and adolescents with chronic paediatric conditions, with an emphasis on endocrine diseases, during the COVID-19 pandemic.

Results: A significant shift in priorities and service delivery has been documented worldwide in the provision of paediatric and paediatric endocrine health care, with telehealth methods having undergone rapid transformation and having been expanded in many centers globally. This is particularly so for children with diabetes. Barriers of telehealth are emphasized, including inability to perform a direct physical examination and the increased burden on health care providers due to the cost and requiring training so as to provide optimal clinical care.

Conclusion: Telehealth has been proven a safe substitute of face-to-face health care delivery and vital for ensuring uninterrupted medical care in children and adolescents with chronic medical conditions, despite its compromises.

Keywords: *Children; COVID-19; Endocrine Diseases; Telehealth; Telemedicine*

Introduction

The COVID-19 outbreak represents an unprecedented global crisis of multifaceted nature and international concern. Alongside its incalculable health consequences, it has also brought unprecedented political and societal challenges and has left an indelible mark on global economy [1]. Soon after COVID-19 was declared as a global pandemic by the World Health Organization (WHO), on March 11, 2020 [2], urgent and aggressive preventive measures were applied worldwide to prevent viral spread due to the virus's highly contagious nature [3]. Such measures included self-protection measures, i.e. wearing face masks and thorough hand washing, as well as school closure and social distancing [4].

The implementation of the above measures created the demand for health care at a distance in order to avoid physical contact and ensure social distancing. Innovative solutions were devised, mostly using existing technologies, which resulted in an overwhelming shift from in-person services to remote telehealth service, i.e. the delivery of patient care using telecommunications technology [5,6].

Limited evidence is available with respect to the use of telehealth for the management of chronic medical conditions in children. The present review summarizes the existing data on the role of telehealth in diagnosing, treating and controlling chronic paediatric diseases during the COVID-19 pandemic, with an emphasis on endocrine conditions.

Telehealth methods

According to the WHO, telehealth is the delivery of heath care services by health care professionals using information and communication technologies for the exchange of valid and correct information, where distance is a critical factor [7]. It is delivered via live video conferencing or telephone [8]. Real-time, but also store-and-forward techniques, can be used [9]. Knowing that the majority of families have at least one digital device with a webcam that enables communication between healthcare providers and patients, the widespread use of telemedicine during the COVID-19 pandemic came as no surprise [10].

Advantages of telehealth

The advantages of telemedicine include limited or no exposure to viruses and bacteria, which minimizes the hazard of disease transmission [11,12]. This is particularly important for medically fragile children suffering from chronic diseases. In addition, virtual visits offer children, and particularly those with special health care needs requiring frequent medical appointments, less time away from home or school, reduced stress, less commute and the ability to focus on their health care needs from the comfort of their own home. It is also a safe and affordable option for many countries under particular conditions [12-14].

Furthermore, remote care reduces the use of resources in health centers [15]. Knowing that the COVID-19 pandemic resulted in redistribution of health care resources and in health system capacities being directed to COVID-19 patients, this is of particular significance. In the same context, patients with chronic afflictions, including children with endocrinopathies, were the most likely to lack specialized care. This is particularly true for patients with diabetes, since diabetes is more complex to treat than other endocrine conditions in children and is associated with increased risk of morbidity and metabolic complications, such as diabetic ketoacidosis (DKA). For these patients in particular, the use of telehealth tools was proven vital for keeping patients connected with their caregivers and ensuring continuous care.

Specifically, challenges regarding diabetes management involve reduced accessibility to medical care due to COVID-19-related preventive measures. It has been reported that during the pandemic routine follow-up visits in the paediatric population were limited, and especially in children with endocrine conditions, due to their parents' fear of exposing them to SARS-CoV-2 and because of priority being given to COVID-19 related health services [16]. This was mitigated to some extend in several centers worldwide, particularly for children with diabetes, by adoption of remote healthcare, that included remote telehealth visits and transmission of data from insulin pumps, glucose meters or CGM devices via a cloud-based platform [17,18].

In addition, it should be noted that inpatient care provided in newly diagnosed T1DM cases has also been affected by the imposed protective measures during the pandemic. It is well established that education in respect to diabetes management requires long meetings between the patient, the family and the multi-member healthcare team, which includes the diabetologist, diabetes nurse, diabetes educators, dietician, psychologist [19]. The COVID-19-related preventive measures necessitated limited exposure to and from the personnel. As a result, only one member of the healthcare team provided education and the number of family members that received education was also restricted to only one, which made diabetes management at home more difficult. The need for alternative educational options was

created, such as virtual clinic training or setting up communication platforms, which often require not previously existing infrastructure and additional time spent by the therapeutic team [20].

Compromises of telehealth

The increased burden on health care providers caused by telehealth visits and the cost related to setting up telehealth through communication platforms for patients and doctors represent barriers to telemedicine. In addition, it should not be ignored that the use of telehealth involves restrictions regarding clinical quality, due to inability to perform a thorough physical examination. As a result, assessment for lipohypertrophy at insulin injection sites or assessment for neuropathy, pubertal examination, anthropometric measurements, blood pressure measurement, but also screening for comorbidities, such as retinopathy, nephropathy, celiac disease, thyroid disorders and dyslipidaemia, are not possible.

Furthermore, important aspects that should not be ignored include the required training of health providers in order to expand virtual communication capacity, achieve high-quality technical experience and, thus, provide optimal clinical care. Also, restricted availability to the Internet, smartphones or computers in several places throughout the globe are additional drawbacks of telehealth. Concerns have also been raised about privacy, accountability and the payment system [21,22].

Some of the aforementioned compromises of telehealth have, to some extend, been attenuated by the rapid transformation telehealth has undergone. Synchronous, but also asynchronous methods of telehealth delivery, i.e. transferring of photographs, are now available. In addition, peripheral devices that can be used at home by parents [23], such as electronic stethoscopes, otoscopes, high-resolution close-up cameras, oximeters, ultrasound machines, are also available. These devices, in conjunction with videoconferencing, enable remote evaluation of almost any examination component. Further progress, however, is needed in the development and adoption of new technologies so that telehealth can be considered a safe communication method for the management of chronic endocrine, or other paediatric, conditions.

Conclusion

Medical care, and particularly endocrine care, in the pediatric population during the COVID-19 pandemic have gained particular attention due to a significant shift in priorities and in service delivery. Telehealth has been proven a safe substitute of in-person visits and face-to-face health care service. The shift from direct physical contact during in-person paediatric medical visits to the use of telecommunication tools by healthcare providers enabled addressing unmet patient needs due to the restrictions related to the pandemic and facilitated optimal and uninterrupted service delivery during non-emergency, routine care.

Therefore, thus far, the experience shows that telemedicine will probably be integrated into paediatric clinical practice after the COVID-19 pandemic. However, incorporating telehealth into paediatric care is based upon the paediatricians' commitment to practice change and willingness to revisit traditional aspects of clinical practice and adopt telehealth support. More importantly, though, it requires strategic planning and investment of capital and human resources.

Learning Points:

1. A shift from in-person medical care to remote care has been documented during the COVID-19 pandemic.
2. Due to the redistribution of health care resources because of the COVID-19, children with chronic diseases, including endocrinopathies, were the most likely to lack specialized care.
3. Telehealth has been proven a safe substitute of in-person visits and face-to-face health care service, despite its compromises.

Declaration of Conflicting Interests

The Authors declare that there is no conflict of interest.

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