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Short-Term Use of Continuous Glucose Monitoring Devices in the Multidisciplinary Active Diabetes Clinic

Wahid U[1], Weis A[1], Munjy L[1,2], Gill G[1]*, De Vito R[3], Solomon A[1], Randhawa M[1], Somaiya C[3], Ha N[1], Phan A[1] and De Coro A[1]

[1]MemorialCare Medical Foundation , USA

[2]Chapman University, USA

[3]National Environmental Health Association, USA

***Corresponding author:** Gagandeep Gill, Memorial Care Medical Foundation, 7421 Edinger Ave Apt 411 Huntington Beach, CA 92647, United States, Email: gagandeepsg@gmail.com

Case Report

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Abstract

The MemorialCare Medical Foundation ACTIVE Diabetes program aims to engage poorly controlled diabetic patients in the management of their chronic disease in order to reduce their risk of macrovascular and microvascular complications. This is done through a combination of medication management and lifestyle coaching. Newer technologies such as continuous glucose monitoring (CGM) devices have become commonly used in order to support patient engagement in diabetes management. In our practice, short term use of CGM devices have been shown to increase patients' awareness of blood sugar trends which leads to improvements in lifestyle changes and medication adherence. Our team first observed this benefit in a case study where significant lifestyle changes were made while a patient was on a CGM for a short period of time. Short term use of CGM devices, if used appropriately, can lead to an improvement in A1C without an increase in medications.

Keywords: Continuous Glucose Monitors; Monitoring Devices; Life Style

Abbreviations: CGMs: Continuous Glucose Monitors; PCP: Primary Care Provider; SGLT2 Inhibitor: Sodium-Glucose Co-Transporter-2 Inhibitor.

Introduction

The Memorial Care Medical Foundation ACTIVE Diabetes program was established in 2012 in response to an unmet need of physicians who wanted greater support in treating complex diabetic patients. The program is comprised of a multidisciplinary team and includes pharmacists, registered dietitians, licensed clinical social workers, and pharmacy technicians. The program embodies the true meaning of the ACTIVE acronym which is Access, Coach, Treat, Integrate, Value, and Empower, by offering a comprehensive diabetes management program for people both with type 1 and type 2 diabetes who have a baseline A1C of 8% or greater (poorly controlled population). This is a referral-based program, in which the team partners through a collaborative agreement with the primary care provider (PCP) to provide patients with medical management, education and motivation for diabetes self-management. The specific objectives of the ACTIVE program are to engage poorly controlled diabetic patients in their care and to reduce their risk of macrovascular and microvascular complications via medication management and lifestyle coaching.

Continuous Glucose Monitoring Devices

Continuous Glucose Monitors (CGMs) are devices that have recently become more widely available to people living with diabetes thanks to several major commercial insurance plans now offering some level of coverage. In 2021 Medicare also made CGMs more available by eliminating the prerequisite of four daily fingerstick checks to qualify for CGM devices. The ACTIVE diabetes clinic regularly utilizes these devices as a tool to support patient engagement in their health and diabetes management. The use of CGM devices has been shown to reduce mean glucose levels, A1C, risk of hypoglycemia and glucose variability while improving quality of life for a variety of patients with both type 1 (T1DM) and type 2 (T2DM) diabetes [1-5].

In our practice, CGMs are introduced when A1C control is not achieved after implementation of medication adjustments with lifestyle coaching or when patients are unable to provide the requested self-monitored blood glucose results. In these cases, the pharmacy technician will assist with explaining insurance coverage benefits to the patient, obtaining the CGM from the pharmacy, and assisting with the initial placement and startup of the CGM. At subsequent visits, the pharmacist will review the CGM data with the patient and addresses any medication adjustments that are warranted. The registered dietitian will review the day-to-day log with the patient and help create relationships between food choices and optimal blood glucose values. The social worker will explore potential barriers to optimal CGM use with patients. At the end of the visit a plan of action is established to further improve glycemic control and to reach the patient's individualized goals.

Case Study

Our team first observed benefits from short-term CGM use when one patient had an A1C reduction after only wearing the CGM for two months and implementing lifestyle changes. Prior to wearing the CGM, this patient had been with the ACTIVE diabetes clinic for over three years and was on a biguanide and sodium-glucose co-transporter-2 inhibitor (SGLT2 inhibitor) for diabetes medications. In those first three years, the patient's diabetes management fluctuated considerably, as is common with chronic diseases. At the time the team suggested trialing a CGM, the patient's A1C was 8.8% and the patient was uninterested in additional diabetes medications. The patient was amenable to trying something new and the team assisted the patient in obtaining a free one-month sample of the on-the-market product CGM. The patient enjoyed wearing the CGM and was surprised to learn how different foods and alcoholic beverages affected blood sugar. The patient began to decrease carbohydrate intake, especially at restaurants, and to choose lower carbohydrate beverages. The patient appreciated the benefits and wanted to continue wearing the CGM but was only able to afford the prescription for one month. During this period, the patient admitted to being inconsistent with taking the SGLT2 inhibitor medication and observed notable blood glucose fluctuation with nonadherence to medications. The patient's A1C was checked one month after no longer wearing the CGM and it had decreased to 8.1% (a 0.7% reduction) with no medication changes. These results motivated the patient to continue making better decisions with food, beverages and medication adherence without further use of the CGM.

Short-Term CGM Use

This patient's results prompted us to look closer at other patients within the clinic to see if a similar benefit could be observed. We reviewed eight patients that had short-term CGM use. All eight patients were enrolled in the ACTIVE diabetes clinic in 2021. The average age was 55 years (range 39-70 years) with a 50/50 split between genders. All patients were diagnosed with T2DM. The average length of CGM use was one month or two 14-day sensors. The average A1C change from prior to after CGM use was -0.3% (average absolute change from 8.0% to 7.7%). During CGM use there were no new medications started, but two patients had adjustments made to existing medication. Of the eight patients that had short-term CGM use, the cost was stated as the reason for discontinuation for five (63%) of them.

The overall trend we saw with short-term CGM use was a reduction in A1C without the addition of medication. Patients made improvements to their food and beverage choices, exercise frequency, stress management, and/or medication adherence, likely due to increased awareness and understanding of their blood sugar trends. We believe this can be attributed to the detailed education the patients received regarding the use of the CGM device, followed by time spent explaining the data provided by the CGM. These results highlight the importance of patient engagement along with clinically meaningful lifestyle changes as a direct result of increased patient awareness and understanding of blood sugar trends.

Next Steps

CGM devices are not always an option for continuous wear. Some limitations to continuous wear of CGMs can include distrust of the technology, discomfort of wear, and information overwhelm. However, in practice, the most common reason for discontinuous CGM wear is cost. This leads to the option of short term CGM use. There has been no clear definition of short term CGM use, however, a previous study defines it as "any planned and agreed use that is intended not to be continuous" [6]. If done appropriately,

short-term use of CGM devices can lead to improvements in blood sugar control without the addition of medications. These lifestyle changes would promote the improvement in diabetes management without the addition of side effects and costs incurred by the addition of medications. Although short-term CGM use is likely common in practice, there is a lack of data on the benefits. More information is needed on the ideal length of time CGM devices should be worn to obtain and maintain diabetes control.

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