Title: Impact of continuous glucose monitoring on medication regimens in Veterans with type 2 diabetes prescribed insulin

Purpose:

This study aimed to investigate the impact of continuous glucose monitoring (CGM) on medication changes in patients with type 2 diabetes (T2DM). CGM has been associated with improvements in T2DM control, but the direct cause of this improvement, whether due to lifestyle changes, medication optimization, or adherence improvements, is unclear. The primary objective of this study was to compare the total number of antidiabetic medication changes before and after initiation of CGM. Secondary objectives included evaluation of the impact of CGM on insulin and non-insulin antidiabetic medication regimens, test strip use, adherence, documentation of CGM data, and hemoglobin A1c (HbA1c).

Methods:

A retrospective pre- and post-cohort study was conducted within the Durham Veterans Affairs Health Care System (DVAHCS) comparing medication regimens in the six months prior to CGM initiation and the six months after. Veterans were eligible for inclusion if they had active outpatient prescriptions from the DVAHCS for Freestyle Libre 14-day CGM sensors and insulin therapy. Veterans were excluded if they had a diagnosis of type 1 diabetes, filled antidiabetic medication prescriptions outside of the VA system, used an insulin pump, were on CGM for <6 months, their CGM prescription was written by community care provider, HbA1c < 7% at CGM initiation or they did not have a baseline HbA1c, they did not refill the CGM sensor, or lacked endocrinology follow up by 9 months of CGM initiation.

Veterans were identified via SQL query of the VA Corporate Data Warehouse (CDW) based on active prescriptions between March 1, 2018, to September 1, 2021. Additional chart review was required for application of exclusion criteria and data collection. The primary endpoint was the total number of changes in Veterans’ antidiabetic medication regimen before and after initiation of CGM. This endpoint was analyzed using the paired t-test to compare the number of medication changes of the same Veteran before and after initiation of CGM.

Results:

The mean number of antidiabetic medication changes made per Veteran in the six months after CGM initiation (1.78) was not significantly improved compared to the mean number of medication changes in the six months prior to initiation of CGM (1.81) (P-value: 0.37). After CGM initiation, there was a statistically significant reduction in the mean number of test strips filled per Veteran per thirty days. The mean number of test strips filled per Veteran per thirty days before and after CGM initiation was 113 and 50, respectively (p-value: <0.00001). HbA1c and medication possession ratio (MPR) were also significantly improved after the initiation of CGM. Other secondary endpoints were not found to differ after the initiation of CGM.

Conclusion:

In Veterans with T2DM, no statistically significant difference in the number of T2DM medication changes made before and after initiation of CGM was observed. The use of CGM did result in a significant change in the number of test strips filled per 30 days, MPR, and HbA1c. Future studies should continue to explore the utility of CGM and its impact on health behavior and clinical outcomes in Veterans with T2DM.