

The Effect of Real-Time Continuous Glucose Monitoring on Glycemic Control in Patients with Type 2 Diabetes Mellitus

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Abstract

Background:

Real-time continuous glucose monitoring (RT-CGM) improves hemoglobin A1c (A1C) and hypoglycemia in people with type 1 diabetes mellitus and those with type 2 diabetes mellitus (T2DM) on prandial insulin; however, it has not been tested in people with T2DM not taking prandial insulin. We evaluated the utility of RT-CGM in people with T2DM on a variety of treatment modalities except prandial insulin.

Methods:

We conducted a prospective, 52-week, two-arm, randomized trial comparing RT-CGM ($n = 50$) versus self-monitoring of blood glucose (SMBG) ($n = 50$) in people with T2DM not taking prandial insulin. Real-time continuous glucose monitoring was used for four 2-week cycles (2 weeks on/1 week off). All patients were managed by their usual provider. This article reports on changes in A1C 0–12 weeks.

Results:

Mean (\pm standard deviation) decline in A1C at 12 weeks was 1.0% (\pm 1.1%) in the RT-CGM group and 0.5% (\pm 0.8%) in the SMBG group ($p = .006$). There were no group differences in the net change in number or dosage of hypoglycemic medications. Those who used the RT-CGM for ≥ 48 days (per protocol) reduced their A1C by 1.2% (\pm 1.1%) versus 0.6% (\pm 1.1%) in those who used it < 48 days ($p = .003$). Multiple regression analyses statistically adjusting for baseline A1C, an indicator for usage, and known confounders confirmed the observed differences between treatment groups were robust ($p = .009$). There was no improvement in weight or blood pressure.

Conclusions:

Real-time continuous glucose monitoring significantly improves A1C compared with SMBG in patients with T2DM not taking prandial insulin. This technology might benefit a wider population of people with diabetes than previously thought.

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Abbreviations: (A1C) hemoglobin A1c, (ADA) American Diabetes Association, (ANOVA) analysis of variance, (BP) blood pressure, (JDRF) Juvenile Diabetes Research Foundation, (PAID) Problem Areas in Diabetes, (RT-CGM) real-time continuous glucose monitoring, (SD) standard deviation, (SMBG) self-monitoring of blood glucose, (SU5) system usability scale, (T1DM) type 1 diabetes mellitus, (T2DM) type 2 diabetes mellitus

Keywords: type 2 diabetes mellitus, lifestyle, real-time continuous glucose monitoring, self-care of diabetes, self-monitoring of blood glucose

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