Patient-Generated Health Data Enhance Clinical Care for People with T2D Using a Digital Health Tool

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Objectives

Optimal management of people with type 2 diabetes who are using complicated pharmacologic regimens often requires collaboration among healthcare providers and educators. Treatment plans specifically utilizing fast-acting insulin regimens, require attention to a person's behaviors related to self-monitoring, food choices, exercise, and medication taking. These patient data are frequently not available to the healthcare team, thus making coaching the patient and adjusting the treatment plan difficult. The purpose of this poster is to illustrate how the viewing of the patientgenerated health data enhances the clinician's ability to modify the treatment plan.

Methods

Four SMART Visit[™] reports were reviewed by a single clinician in patients with type 2 diabetes using BlueStar® Diabetes (Welldoc, Inc., Columbia, MD) during live or remote patient encounters. The reports were transmitted within app to the clinician's office electronically or via FAX. The reports were de-identified according to the Welldoc's data policies. Salient information from the reports were extracted and treatment changes were reviewed for this poster.

Conclusions

This poster reviews four reports created by a digital health tool from patient-generated health data. The reports contained medication information, standard of care measures, BG data summarized graphically by time and by modal day, as well as a projected A1C. In addition, this report uniquely summarized selfmanagement behavior such as self-monitoring, healthy-eating, medication taking, and activity. Finally, a detailed log book view can be useful for trouble-shooting self-management problems by examining cause and effect relationships. As can be seen from these four examples, the information extracted from the reports can guide diabetes clinicians and educators into optimization of the users' treatment plans.

References

Quinn C et al. Cluster-Randomized Trial of a Mobile Phone Personalized Behavioral Intervention for Blood Glucose Control Diabetes Care September 2011; vol. 34 no. 9: 1934-1942.

Tang P, Peeples M, Duni J, Peskin S, Macleod J, Kowitt S, and Fisher E. eHealth-Assisted Lay Health Coaching for Diabetes Self-Management Support. Poster presentation at the 2018 Scientific Meeting of the American Diabetes Association, New Orleans, 2016.



Results

A: Fasting and post-dinner hyperglycemia



This basal-bolus insulin user checked 99 BGs in that past month (a). The data show that the fasting BG average is high (b) as well as the post-dinner BG average (c). Meal-time insulin dosing with breakfast seems adequate based on BG, carbohydrate, and medication entries (d). Potential treatment plan changes may include optimizing the basal insulin dose and dinner-time insulin dose

C: Erratic blood glucose values after dinner



This BlueStar Diabetes user has a projected A1C that increased from 6.6% to 7.1% over the past 3 months (a). The fasting BGs are generally in target (b); the post-dinner BGs have a wide variation (c). This is confirmed in the detailed log book view which shows good fasting BGs (d) but either very high (e) or very low (f) post-dinner BGs. This user is entering most BGs in real-time. This user may benefit from tracking meals (h), insulin dose (i), and/or activity (j). Variations in BG were found to be due to an erratic work schedule that included heavy labor





B: Good A1C in the presence of hypoglycemia and hyperglycemia



This basal-bolus insulin user has a projected A1C of 7.3% (a), which is only slightly above target and much better than the A1C in the laboratory (11.9%) that was obtained before starting to use BlueStar (b). This user, however, has trouble with both very high BGs and very low BGs (a). Despite recording 39 BG values in the past month, very few of them were in real-time, which means that this user is not receiving the real-time, automated messaging from the BlueStar Diabetes in-app coach (c). The detailed log book view, which displays both BG, carbohydrates, and insulin doses, demonstrates improper meal-time insulin dosing (d).

D: Trouble in week 3



This user's BG control deteriorated on week 3 of the report (a) which was not apparent on the modal day view (b). The clinician was able to explore the issues that caused the user trouble during this time period. This user recorded carbs 54 times during the time period of this report. The amounts varied from 1 gram to 83 grams (c). These data provide significant value in coaching the patient on self-management.