APRIL 2018

Diabetes Care®

In This Issue of *Diabetes Care*

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Optimizing MiniMed 670G Artificial Pancreas Technology Use in Adolescents and Young Adults

A subanalysis of the pivotal trial of Medtronic's MiniMed 670G hybrid closed-loop insulin management system reveals a series of insights and teaching points on how the system performs with adolescents and young adults with type 1 diabetes. According to Messer et al. (**p. 789**), 31 participants age 14–26 years were included in the analysis. In line with the original study design, the participants had a 2-week run-in (baseline) period with the system running in open-loop mode, followed by 3 months with hybrid closed-loop mode activated. Data were then compared between baseline and the closed-loop period at 1 week and at 1, 2, and 3 months. They report that after 3 months with the system in fully automatic mode, participants experienced a 14% increase in time in range, a mean decrease in HbA_{1c} of 0.75%, and no overall changes in the amount of dosed insulin. Carbohydrate-to-insulin ratios were more aggressive in comparison to the run-in period when the system was in open-loop setting. However, time in Auto Mode did gradually decline from 87% to a final rate of 72% over the 3-month study period. The researchers report that the primary reasons for exiting Auto Mode were system-initiated events where the set-up entered Safe Basal Mode or where overt hyperglycemia occurred where the system required manual intervention to correct insulin dosing. Much less common, however, were user-initiated exits from Auto Mode. Author Laurel H. Messer told *Diabetes Care*: "Our intent with this subanalysis was to bring clinically useful information on hybrid closed-loop therapy to the forefront as carbohydrate-to-insulin ratios make an appreciable difference. Seventy percent time in range correlated approximately with seventy-five percent hybrid closed-loop use. These are tangible pearls that clinicians can leverage with their patients. We are just scratching the surface of useful information for hybrid closed-loop systems, and ongoing evaluation of system characteristics will be essential for current and future automated insulin delivery systems."

Messer et al. Optimizing hybrid closed-loop therapy in adolescents and emerging adults using the MiniMed 670G System. Diabetes Care 2018;41:789–796

Higher Quality Diets and Exercise Reduce Risk of Type 2 Diabetes in China

Long-term dietary quality, especially in conjunction with exercise, is likely to be associated with type 2 diabetes risk in urban Chinese adults, according to Yu et al. (**p. 723**). They report that individuals who maintained a healthy diet in the long term and exercised had a reduced risk for the disease of 45%. Using a prospective study design, they followed just under 118,000 individuals (age 40–74 years) living in Shanghai from 1996 to 2015, assessing diet quality over the period with food-frequency questionnaires and a calculated healthy diet score (HDS). The HDS combines the outcomes of eight food groups, which had previously been linked to diabetes risk, with a higher value representing a healthier overall diet. All individuals that were involved in the study were free of diabetes, cardiovascular disease, and cancer at baseline. The researchers identified 6,111 incident cases of type 2 diabetes during an average follow-up of 11.5 years and report that higher HDS was associated with lower diabetes risk when they compared the highest versus lower quintiles and adjusted for a range of confounding factors. Maintaining a high score over the study period was associated with a 26% lower risk of diabetes than when a consistently low score was maintained. The relationship held regardless of a range of confounding factors but was enhanced among those with a high HDS who also engaged in exercise during leisure time. Commenting more widely on the study, author Danxia Yu said: "Our study is one of the first large prospective analyses of long-term diet quality and its changes—via repeated dietary assessments—in relation to diabetes risk. We found significant beneficial effects of a healthy dietary pattern on preventing type 2 diabetes among urban Chinese adults. We hope our findings will promote more research in Asian populations, educate the public, and inform health policymakers in China and other Asian countries."

Yu et al. Long-term diet quality and risk of type 2 diabetes among urban Chinese adults. Diabetes Care 2018;41:723–730

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Clinical/Quality of Life Improvements in Obese Patients With Type 2 Diabetes Following RYGB Surgery

According to Simonson et al. (**p. 670**), Roux-en-Y gastric bypass (RYGB) surgery can lead to a series of clinical and quality of life improvements over 3 years in patients with type 2 diabetes and mild-to-moderate obesity. In comparison to an intensive medical and weight management (IMWM) program, surgery reportedly resulted in a larger percentage of patients achieving normal (nondiabetes) glycemia, greater improvements in HbA_{1c} and fasting plasma glucose, and increased weight loss. Additionally, there were also greater cardiometabolic benefits and improvements in several measures of quality of life following surgery. Weight loss, in particular, seems to improve patient perceptions of their quality of life. As a result, the authors state that their data add to growing evidence that RYGB should now be considered in appropriate patients with type 2 diabetes and even those with moderate obesity. The study randomized 38 patients with type 2 diabetes and obesity to either receive RYGB surgery or enrollment in an IMWM program. Metabolic assessments and various clinical laboratory tests were then used to assess weight, HbA_{1c}, and cardiovascular risk at regular intervals following enrollment up to 3 years. A series of self-reported health status and quality of life questionnaires were also administered. The authors report that after 3 years of follow-up, in comparison to the IMWM program, surgery resulted in greater reductions in weight (−24.9 vs. −5.2 kg) and HbA_{1c} (−1.79 vs. −0.39%). Quality of life and cardiometabolic risk levels for coronary heart disease and stroke were reportedly more favorable following surgery rather than the IMWM program. According to author Donald C. Simonson: "As a result of these findings, we expect that more physicians will consider gastric bypass surgery as a viable option for patients with type 2 diabetes and mild-to-moderate obesity when previous attempts to lose weight and improve glycemic control have not been successful."

Simonson et al. Clinical and patient-centered outcomes in obese patients with type 2 diabetes 3 years after randomization to Roux-en-Y gastric bypass surgery versus intensive lifestyle management: the SLIMM-T2D study. Diabetes Care 2018;41:670–679

Diabetic Kidney Disease and Cardiovascular Disease Risk in Type 1 Diabetes

Excess mortality in type 1 diabetes when kidney disease (albuminuria) is not present is likely driven by acute diabetes complications (such as hypoglycemia and ketoacidosis) in early years and additionally cardiovascular disease (CVD) risk in later years, according to Groop et al. (**p. 748**). But how does that finding fit with the wider picture of mortality risk associated with type 1 diabetes? According to de Boer and Bakris (**p. 662**), the findings by Groop et al. are in fact consistent with evidence that diabetic kidney disease (DKD) remains a major cause of death in type 1 diabetes. While acknowledging the conclusions of Groop et al., and that they likely mean not all excess CVD risk is restricted to people with DKD, de Boer and Bakris point out that the mortality rate in the patients without albuminuria was much lower than the wider Finnish Diabetic Nephropathy Study cohort from which they were taken—34 vs. 110 per 10,000 person-years. They also note similarities to mortality rates due to kidney disease seen in the Pittsburgh Epidemiology of Diabetes Complications Study. They write that the results of Groop et al. should offer some clinical guidance for the care of type 1 diabetes patients without albuminuria, but that the results also highlight the importance of treating hyperglycemia in type 1 diabetes. Commenting more widely on the research, author George L. Bakris said: "Reducing cardiovascular risk is of paramount importance regardless of the type of diabetes. It is clear that over the past 50 years there has been a 40% reduction in people progressing to end-stage kidney disease, and this is predominantly since 1980. This, coupled with reduced cardiovascular event rates in recent clinical trials of people with type 2 diabetes, clearly signals that we have made inroads into reducing cardiovascular and renal risks if patients cooperate with the standard of care. This has been made easier with insulin pumps, but the diet is still up to the patient."

de Boer and Bakris. Diabetic kidney disease: a determinant of cardiovascular risk in type 1 diabetes. Diabetes Care 2018;41:662–663

https://doi.org/10.2337/dc18-ti04