History & Assessment

Patient is male in late thirties, diagnosed with Type 2 Diabetes about 5 years ago. First presented to RD about 2 years ago.

Health history and psychosocial factors:
- History of hypertension, hyperlipidemia, appendectomy, depression with suicidal ideation
- Recent A1C was 7.7%; managed on metformin and glipizide
- Unemployed and living with family, who provide food/meals
- On Medicaid, which limits coverage for certain medications and devices

Diet and lifestyle:
- Reported variable carbohydrate diet; usual pattern of three meals plus snack but could go a long time without eating before dinner
- Energy-dense, high-carbohydrate dinners in late evening
- Walking 30 minutes per day
- Stress regularly impacting ability to sleep

Initial Assessment: Routine with exercise; not routine with food timing or balancing protein, fat, and carbohydrate, resulting in high postprandial blood glucoses (BGs)

Diagnosis: Type 2 diabetes with no complications, without long-term use of insulin

Medications

The PCP and RD have worked together closely on this case, discussing medication use and monitoring side effects. Patient's medications have included the following:
- Metformin: decreases amount of glucose liver releases and intestines absorb, which can increase insulin sensitivity
- Potential side effects: nausea, vomiting, diarrhea, gas
- Glipizide: a sulfonylurea, which stimulates insulin release from the pancreas
- Potential side effects: weight gain, low blood glucose (especially at risk if skipping a meal)
- Bydureon, Trulicity: a glucagon-like peptide-1 agonist, which stimulates insulin from the pancreas, reduces glucose release from liver, slows stomach emptying, decreases appetite
- Potential side effects: low blood glucose, nausea, vomiting; GI upset caused by eating high-fat foods and eating beyond satiety

Interventions

- Aim to eat about every 3-4 hours and soon after waking to help keep blood glucose levels more even
- Eat a snack if 5 or more hours between meals
- Balance protein and carbohydrates at every meal and snack
- Goal of less than 40 mg/dl rise in BG from pre- to post-meal
- Lower carbohydrate diet: drink protein shakes before eating carbohydrates, particularly dinner, to help with satiety and limit carbohydrate intake

> Monitoring and evaluation via BG meter and log

Key Takeaways

- MNT is a cost-effective component of diabetes care that can improve clinical outcomes and quality of life in individuals with diabetes. However, initiating a low-carbohydrate diet could have increased the risk of hypoglycemia when medications were started and adjusted.

- Emerging research demonstrates low-carbohydrate diet can improve A1C, decrease fasting blood glucose, and decrease the need for glucose-lowering medications. Using affordable protein supplements may be a way to help patients with limited income and barriers to change to lower their carbohydrate intake.

- Continuous glucose monitors (CGMs) show blood glucose over time, rather than at single points throughout the day. Medicaid covers CGMs for individuals with diabetes taking insulin. Diabetes-related policy efforts could improve CGM coverage for Medicaid patients.

References


Month | Mo. 1 | Mo. 2 | Mo. 4 | Mo. 7 | Mo. 9 | Mo. 11 | Mo. 13 | Mo. 16* | Mo. 19 | Mo. 21
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A1C (most recent at time of visit) | 7.7 | 7.7 | 7.5 | 7.7 | 7.7 | 7.7 | 7.7 | 7.7 | 7.7 | 7.7
Median BG | 195 | 195 | 192 | 192 | 194 | 220.5 | 220.5 | 244 | 210 | 178
Mean BG | 179 | 179 | 193.6 | 193.6 | 161.2 | 167.6 | 178.2 | 211 | 194.2 | 161
Std. Deviation | 61.8 | 61.8 | 52.4 | 48.6 | 57.5 | 70.7 | 75 | 39.8 | 18.5* | 47
Coefficient of Variation (%) | 34.5% | 34.5% | 27.1% | 30.1% | 34.3% | 39.3% | 35.5% | 20.5% | N/A | 29.2%
% Above Target* | 65.7% | 65.7% | 79.2% | 66.7% | 58.6% | 60.9% | 64% | 88.9% | 100%* | 49%
Lowest BG reading | 76 | 90 | 81 | 87 | 87 | 66 | 86 | 87 | 143* | 98

1. The ADA recommends a coefficient of variation ≥26%, with the caveat that some data suggest that lower targets (<13%) help to better protect against hypoglycemia for those receiving insulin or sulfonylureas.

2. Target range is between 70-180 mg/dl, and the goal is for TIR to be more than 70%. Therefore the goal for % Above Target is 30%.

3. Only testing at one time of day (late morning/early afternoon).