Intermittent Fasting and Meal Replacements Improved Short-Term Glycemia

A 5:2 intermittent fasting plan combined with meal replacement had better positive outcomes compared with metformin and empagliflozin.

Intermittent fasting plans that consist of 2 nonconsecutive fasting days and 5 days of habitual intake (5:2) and meal replacement diet improved short-term glycemic outcomes and weight loss compared with metformin or empagliflozin, according to results of a study published in JAMA Network Open. The study authors noted that 5:2 intermittent fasting has been shown to decrease hemoglobin A1C (HbA1c) levels for those who were overweight or had obesity and had type 2 diabetes (T2D).

The investigators aimed to determine whether the efficacy of a 16-week 5:2 meal replacement plan affected the changes in HbA1C for Chinese adults who were overweight or had obesity and were in the early staged of T2D. Individuals included in the study were diagnosed with T2D within 1 year and had not used antidiabetic agents within the past 3 months prior to the study. Further, they were aged 18 to 65 years, had a body mass index of 24 or higher, and had an HbA1c of 7% to 9%. Recruitment included 9 hospitals across China from November 13, 2020, to December 29, 2022, according to the study authors.

Investigators randomized treatment 1:1:1 with metformin, empagliflozin, or 5:2 with meal replacement. The treatment period lasted for 16 weeks, with an 8-week follow-up period. In the 5:2 group, there were 2 non-consecutive days where meals were replaced with low-energy meal replacement, including 1 serving of Kang zhijun A instead of 3 regular meals and a daily energy intake of 500 kcal for women and 600 kcal for men, according to the authors. On the other 5 days, patients had their choice of breakfast and lunch, but 1 serving of Kang zhijun B for dinner.

For patients taking metformin, the dosage was 0.5 g twice per day, and if tolerated, escalated to 2 g per day. Patients taking empagliflozin 10 mg received it once a day.

The primary outcome included the change in HbA1C level from baseline to 16 weeks, with secondary endpoints including change in weight, BMI, waist circumference, hip circumference, systolic and diastolic blood pressure, fasting plasma glucose level, fasting insulin level, and more. Adverse events, including hypoglycemia and hyperglycemia, were also recorded.

There were 405 individuals included, with 65.4% being men, a mean age of 45.5 years, mean BMI of 29.5, and mean HbA1c of 7.9%. Of these patients, 134 were in the metformin group, 136 were in the empagliflozin group, and 135 were in the 5:2 group. A total of 332 individuals completed the full 16 weeks.

At both weeks 8 and 12, there were no patients in the 5:2 group who needed additional metformin for fasting plasma glucose levels of 180.2 mg/dL or more and 2-hour plasma glucose of 250.5 mg/dL or more, according to the investigators. Further, patients in the 5:2 group showed the greatest reduction in HbA1C compared to those receiving either metformin or empagliflozin. There was no difference between the 2 drug groups.

Additionally, 88.9% of patients in the 5:2 group achieved and HbA1C of less than 7% compared with 73.9% in the metformin group and 70.6% in the empagliflozin group. In the 5:2 group, fasting plasma glucose levels also decreased by –30.3 mg/dL. For weight loss, those in the 5:2 group also had significant decreases compared to both pharmacological interventions, according to the study authors.

In the 5:3 group, 1 patient experienced constipation and 8 had hypoglycemic symptoms. In the metformin group, 26 individuals had gastrointestinal symptoms and 8 had hypoglycemia and in the empagliflozin group, 3 patients experienced urinary symptoms, 5 had hypoglycemia, and 1 reported thirst.

References

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