

Review: Evidence is inconclusive about the role of lower-carbohydrate diets in weight loss in the outpatient setting

Bravata DM, Sanders L, Huang J, et al. Efficacy and safety of low-carbohydrate diets: a systematic review. *JAMA*. 2003;289:1837-50.

QUESTION

In adults in the outpatient setting, how effective are lower- vs higher-carbohydrate diets?

DATA SOURCES

Studies were identified by searching MEDLINE (January 1966 to February 2003), scanning bibliographies of relevant articles, and reviewing conference proceedings.

STUDY SELECTION

English-language studies were selected if they described adults who were not pregnant in the outpatient setting who used low-carbohydrate, ketogenic, higher-protein, or higher-fat diets ≥ 4 days duration and ≥ 500 kcal/d, and if carbohydrate content (g/d) and total calories (kcal/d) consumed were reported. Studies were excluded if participants were confined to a research or diet center, and if they did not report data for ≥ 1 clinical outcome of interest.

DATA EXTRACTION

Data were extracted on study design, participants, dietary interventions, and outcomes.

MAIN RESULTS

107 studies met the selection criteria. After duplicate reports of the same studies were

combined, 94 studies (3268 participants) of dietary interventions were included. 43 studies were randomized (24 were randomized controlled trials [RCTs] and 19 were randomized crossover trials), 17 were studies with control or comparison groups, 9 used sequential study designs, and 25 were before-and-after studies. 663 participants (mean age 37.6 y) received lower-carbohydrate diets (≤ 60 g/d of carbohydrates) and 2605 participants (mean age 44.3 y) received higher-carbohydrate diets (> 60 g/d of carbohydrates); no difference was found in the mean ages of recipients of lower- vs higher-carbohydrate diets. Of those who received lower-carbohydrate diets, 71 participants received lowest-carbohydrate diets (≤ 20 g/d of carbohydrates). Lower-carbohydrate diets had lower caloric content than higher-carbohydrate diets (mean 1446 vs 1913 kcal/d, $P = 0.002$). Based on all included studies, heterogeneity was found with respect to design, carbohydrate content (range 0 to 901 g/d), total caloric content (range 525 to 4629 kcal/d), diet duration (range 4 to 365 d), and participant characteristics. No study assessed diets ≤ 60 g/d in participants with a mean age > 53.1 years. The 43 RCTs showed no signif-

icant heterogeneity. Among the RCTs, no differences were shown between 7 lower-carbohydrate diets (132 participants) and 75 higher-carbohydrate diets (1122 participants) for weight change (mean weight decrease 3.6 [95% CI 1.2 to 6.0] vs 2.1 kg [CI 1.6 to 2.7], respectively) or lipid or fasting serum glucose levels.

CONCLUSIONS

In adults in the outpatient setting, lower-carbohydrate diets do not result in greater weight loss than higher-carbohydrate diets. More rigorous studies are needed to show the efficacy and safety of lower-carbohydrate diets.

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COMMENTARY

3 RCTs published after this extensive review found greater weight loss, without adverse effect, for low-carbohydrate diets over 6 months (1–3). At 1 year, comparative weight loss changes did not differ between groups (2). Even when the right diet and patient are aligned, adherence is still the key to long-term success for safe, effective, lasting weight loss. Thus, the key finding by Bravata and colleagues is lack of harm; no adverse effects were seen on fasting glucose, lipid, insulin, or blood pressure levels. Low-carbohydrate diets seem to be no more or less effective at safely attaining and maintaining weight loss than the “gold standard,” a traditional low-fat diet.

These 2 dietary approaches may be treating different types of obesity. Systemic disease is often seen as 1 entity and expected to respond similarly to like treatment in all persons. Yet, persons diagnosed with the “same” disease (e.g., those with diabetes) can respond differently to like treatment, possibly because varying individual genetic and psychosocial milieus affect disease presentation and treatment response.

Part of the genetic component is insulin resistance, the probable common pathway for “metabolic syndrome.” Physiologic effects of the glycemic index (4) provide some theoretical construct for low-carbohydrate diets and may be why people who successfully use low-carbo-

hydrate diets consume fewer calories (3). Scant evidence exists that low-carbohydrate diets advance weight loss through increased calorie use via ketogenesis. However, if low-carbohydrate diets safely modify insulin response so that the urge to consume calories decreases (4), it seems a rational alternative for suitable persons. If so, we still lack the means to determine in advance who might benefit.

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