Ketogenic diet for weight loss

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Clinical question

Is the ketogenic diet effective for weight loss?

Bottom line

Ketogenic diets can help patients lose about 2 kg more than low-fat diets do at 1 year, but higher-quality studies show no difference. Weight loss peaks at about 5 months but is often not sustained. Individual weight change can vary from losing 30 kg to gaining 10 kg with any diet.

Evidence

- In a systematic review of 13 RCTs of ketogenic versus low-fat diets (N=1577, 61% women, BMI 30 to 43 kg/m^2), those on ketogenic diets lost 0.9 kg more than those on low-fat diets at 12 to 24 months (statistically different).[1]
  -There were statistically significant but likely clinically meaningless changes in surrogate markers.
  -The dropout rate was 13% to 84% across studies.
- A systematic review of 11 RCTs (N=1369, 71% women, BMI 30 to 36 kg/m^2) found at 6 to 24 months[2] that the ketogenic diet group lost 2.2 kg more than the low-fat diet group (statistically different but results were inconsistent). Higher-quality studies showed no difference.
  -Surrogate marker changes were similar to those above.[1,2]
- Other systematic reviews (5 to 24 RCTs) were confounded by low-carbohydrate diets that were likely not ketogenic. Results ranged from no difference[3-5] to a 3.6-kg loss.[6-8]
- No systematic reviews or RCTs examined mortality or cardiovascular disease.[2]
- An RCT (N=609) found weight loss at 1 year for low-carbohydrate diets (<20 g/d to start) of 6.0 kg compared with 5.3 kg for low-fat diets (not statistically different).[9]
  -Patient genotypes (favouring 1 diet type) had no effect.
  -Weight change varied from losing 30 kg to gaining 10 kg in either group.

Context

- A typical Canadian diet contains 48% carbohydrates, 32% fat, and 17% protein.[10]
- Most ketogenic diets start with carbohydrate restriction of less than 20 to 50 g/d (10% of energy intake) for about 2 months before slow reintroduction.[1,11]
- Weight loss peaks at about 5 months, then weight is slowly regained.[12]
- Ketogenic diets tend to decrease caloric intake.[9,12]
- Observational data suggest long-term low carbohydrate intake might be associated with increased mortality.[13]

Implementation

Ketogenic diets imply minimizing carbohydrate intake and maximizing protein intake to induce ketosis.[12] Adverse effects are common, including constipation (33%), halitosis (30%), muscle cramps (28%) (numbers needed to harm of 3 to 4 compared with low-fat diets), headache, diarrhea, weakness, and rash (numbers needed to harm of 5 to 7).[14] Urine ketone monitoring is advocated in the lay press, but it is not consistently reported in RCTs and its benefit is unknown.

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Competing interests
None declared

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