

Don't Throw Out the Baby With the Bathwater

A Commentary On Very-Low-Calorie Diets

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Over the past few years, very-low-calorie diets (VLCDs) have received national attention. The country watched as Oprah Winfrey lost weight on this diet regimen. Based, in part, on her success, participation in commercial VLCD programs skyrocketed. However, when the weight was regained—again before a TV-viewing audience of millions—the popularity of these programs suffered.

It seems to be the time to step back from the television and to scientifically appraise the role of VLCDs. Do they have a place in the treatment of obesity? What are the pros and cons of such regimens? The goal of this commentary is to present one person's opinion on these diets and hopefully to stimulate thinking and research about the issues raised.

WHAT ARE VLCDs? — VLCDs are defined as diets of <800 kcal/day (1). These diets were developed to achieve maximum weight loss while preserving lean body mass. To accomplish this, VLCDs provide a daily intake of 1.0–1.5 g protein/kg ideal body wt. VLCDs are typically used for periods of ~12 wk, followed by structured refeeding.

VLCDs are most commonly consumed as liquid formulas, which include 100% of the RDA for amino acids, essential fatty acids, vitamins, minerals, and trace elements. However, these diets can also be administered in a food version, where patients consume only lean meat, fish, and fowl. With this format, patients must include appropriate vitamin and mineral supplements in their regimen, but weight losses on the food and liquid version appear similar (2).

VLCDs are usually recommended for patients who are >30% above ideal body weight, since thinner patients experience greater loss of lean body mass when treated with VLCDs (1). Moreover, a history of liver, renal, or cerebrovascular disease, insulin-dependent diabetes, or recent myocardial infarction contraindicates the use of VLCDs (1).

WHAT ARE THE ADVANTAGES OF USING THESE DIETS? — The major advantage to VLCDs is that they work—i.e., they achieve their goal of producing maximal short-term weight losses. On average, patients on VLCDs lose 20 kg in 12 wk. Men lose more

than women and heavier patients lose more than lighter patients. However, it appears that a large percentage of patients achieve significant weight loss on VLCDs. In a recent study that we conducted with VLCDs, 89% of patients treated with VLCDs lost ≥10% of their initial body weight compared with only 56% of patients on a 1000- to 1200-kcal diet.

In clinical programs that use VLCDs, attrition rates are very high (3,4); however, among those who remain in the program, weight losses are again excellent. For example, Hovell et al. (4) reported that 56% of patients dropped out of a 16- to 26-wk VLCD program, but among those who completed treatment, men lost 28.6 kg and women lost 24 kg.

In contrast to the early liquid diets of the 1970s that were associated with numerous deaths, current VLCDs appear to be relatively safe. These diets have been used by >20 million people worldwide with no reports of major hazard (5). Although recent evidence suggests that VLCDs may be associated with the development of gallstones (6,7), the frequency of this problem and whether it relates to VLCDs or to weight loss remains unclear. Several studies have found no evidence of cardiac abnormalities for up to 12 wk on VLCDs (8,9); there is also no evidence that VLCDs produce permanent decreases in resting metabolic rate (10) or a loss of lean body mass (11,12) that exceeds what would be expected from the magnitude of weight loss achieved.

Another advantage of VLCDs is that these diets are easy for patients to follow. Patients report decreased levels of hunger on these diets (13), and in one controlled study (14) actually reported lower levels of hunger and less preoccupation with food than subjects consuming a 1000- to 1200-kcal/day diet. There have been no reports of untoward psychological responses to these diets. Patients on VLCD alone report no change in depressive symptom-

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atology, whereas those on VLCDs used in combination with behavior therapy report improvements in mood state that are comparable to the improvements seen with behavior therapy alone (13–15).

Finally, these diets produce marked improvements in blood pressure, serum lipids, and glycemic control. Kirschner et al. (3), reporting on the results of a commercial weight-loss program, noted that 41% of patients entering the program had blood pressure >140/90 mmHg, and half of these were on medication. Consequent to weight loss, 71% of these patients had normalized their blood pressure and were able to discontinue medication. Among those with fasting hypertriglyceridemia (>170 mg/dl), 77% had normal values after weight loss, and in those with hypercholesterolemia (>250 mg/dl), 73% returned to normal. Non-insulin-dependent diabetic patients experience dramatic reduction in glycemic control often within 10 days of starting these diets (16–18), and a recent study (19) reported long-term benefits of VLCDs for obese non-insulin-dependent diabetic patients. Moreover, triglycerides and cholesterol decrease and high-density lipoprotein cholesterol levels increase in non-insulin-dependent diabetic subjects after VLCDs (20). It is not known whether VLCDs produce more (or less) improvement in these risk factors than other regimens if weight losses are equated; however, VLCDs clearly produce significant weight loss, and weight loss improves cardiovascular heart disease risk factors.

WHAT ARE THE DISADVANTAGES OF VLCDs?

As I read the literature, there is one major concern about these diets: patients do not maintain the weight they have lost. Several randomized studies have shown that VLCDs used as a treatment in and of themselves produce rapid weight loss, but the weight is

then regained (15,21). However, better results have been obtained when VLCDs are used as a component of a behavior therapy program (15,21,22). It is these combination regimens that I believe deserve our continued attention and will be the focus of the remainder of this commentary.

Three randomized controlled trials have compared behavioral weight-loss programs that used balanced low-calorie regimens (1000–1500 kcal/day) versus behavioral programs that included a period (8–12 wk) of VLCDs. In the earliest of these studies, Wadden and Stunkard (15) found that the use of the VLCD increased weight losses at the end of the 20-wk program (19.3 kg in VLCD plus behavior therapy vs. 14.3 kg in behavior therapy with balanced low-calorie regimen). Both groups regained weight over the year of follow-up, with no significant differences in the amount regained. At 1-yr follow-up, patients treated with behavior therapy and a balanced diet maintained a loss of 9.5 kg, whereas patients treated with behavior therapy plus a VLCD maintained a loss of 12.9 kg; this difference between treatments was not statistically significant. Likewise, there were no significant differences between treatment at 3 or 5 yr follow-up (23).

Miura et al. (21) studied Japanese patients and found that the combination of behavior therapy plus VLCD produced significantly better weight losses at the end of the 20-wk program and at 2-year follow-up. Patients in both the behavior therapy alone and the behavior therapy plus VLCD groups had close to perfect maintenance of weight loss over the 2 yr of follow-up. Thus, both the studies by Miura et al. (21) and Wadden and Stunkard (15) found no difference in the maintenance of weight loss after a 1000- to 1500-kcal/day diet versus a VLCD when both were used in the context of a behavior therapy program.

Wing et al. (19) made the same comparison in obese non-insulin-de-

pendent diabetic patients. The combination of VLCD plus behavior therapy improved short-term weight loss compared with behavior therapy alone. However, in the Wing et al. study, the weight regained in the year after VLCD was significantly greater than the weight regained after behavior therapy; consequently, at 1-yr follow-up there were no significant differences between treatments.

These studies leave several key questions unanswered. First, it is not clear whether there is actually faster weight regain after behavioral programs with VLCDs than after behavioral programs with balanced low-calorie regimens (1000–1500 kcal/day), and if so, whether this increased rate of regain is due merely to the larger initial weight losses produced by VLCD or to some other aspect of the VLCD (e.g., the speed of the initial weight loss). To answer this, we urgently need data that compares the weight regain of patients who lose equal amounts of weight on different types of regimens (VLCDs vs. 1000- to 1500-kcal/day diets). Such data will answer the important question of whether it is VLCD-produced weight loss that is poorly maintained, or whether it is any and all weight loss that is poorly maintained.

Secondly, we need information about whether a period of dramatic weight loss and regain is better or worse for patients than moderate weight loss. Recent data on weight cycling raises concerns about periods of weight loss followed by regain for all cause and cardiovascular heart disease mortality (24,25). However, these studies have not specifically focused on overweight patients, nor on voluntary weight loss, making it difficult to know the relevance of these data to the overweight patient (26).

BALANCING THE PROS AND CONS OF VLCDs — The important thing about VLCDs is they actually do

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