

Chapter 74

Very Low Calorie Diet (VLCD) in the Copenhagen Projects

There are many ways to use a good formula diet

F. QUADE

Department of Endocrinology, Hvidovre Hospital, University of Copenhagen, Denmark

For many years we have listened to the debate as to whether very low calorie diets (VLCDs) are risky or not, and for what purposes, if any, they should be used¹⁻⁴. During this period of time, evidence has been accumulating to convince the majority of clinicians – to whom I belong – that most modern versions of VLCD, i.e. the nutritionally complete formula diets, do in fact fulfil the conditions required for treatment of medical disorder: safety and effectiveness leading to an amelioration of morbidity. Indeed, when one considers the prevalence of obesity and the widespread use of VLCDs, there are statistical reasons for wondering why so few accidental mishaps have been reported.

The formula diet we prefer (Nupo[®], Oluf Mørk Ltd) covers all nutritional requirements. The daily ration yields 388 kcal (1.6 MJ), 56 g protein for women; and 446 kcal (1.9 MJ), 68 g protein for men. Over the years this preparation has been tested in our department on hundreds of obese patients in a number of controlled trials, with only few and clinically unimportant complaints of side effects.

In a randomized trial⁵ comparison was made between 27 patients who were operated on with a horizontal gastroplasty a.m. Gomez, and 30 patients treated with formula diet as sole source of nutrition, given for an unrestricted number of repeated periods, each of 2 months, only interrupted by 2 weeks on conventional low energy diet (Fig. 1). The immediate weight losses were equally good in the two groups. Untoward events were negligible in the VLCD group, whereas there were some – although not many and not serious – complications to surgery. However, after 5 years⁶ the success rate was significantly smaller in the VLCD group (17 %) than in the gastroplasty patients (30%). Success was defined as a body weight being maintained at a level of at least 10 kg below the initial overweight. Everybody agrees that the frequency of weight regain is the main problem in obesity treatment. However, this can hardly be blamed on VLCD more than on any other diet: all chronic disorders tend to recur when you stop treating them.

The experience with the above mentioned trial led to the next treatment modality⁷. It is composed of two steps: preoperative VLCD to achieve weight loss without risk, followed by gastroplasty to minimize relapse, and also to induce further weight loss. Only patients who reduced their initial excess weight by at least 40% qualified for surgery. The design has several advantages: the patients have proved themselves capable of dietary discipline – which is all-important after gastric restriction – and the operation is made easier, both for patient and surgeon. The surgical part of the study was a randomized comparison between horizontal gastroplasty a.m. Gomez and Mason's vertical banded gastroplasty. As it turned out, the latter was significantly superior in leading to a greater additional weight reduction. A recent Danish review concludes that horizontal gastroplasty should be abandoned and that

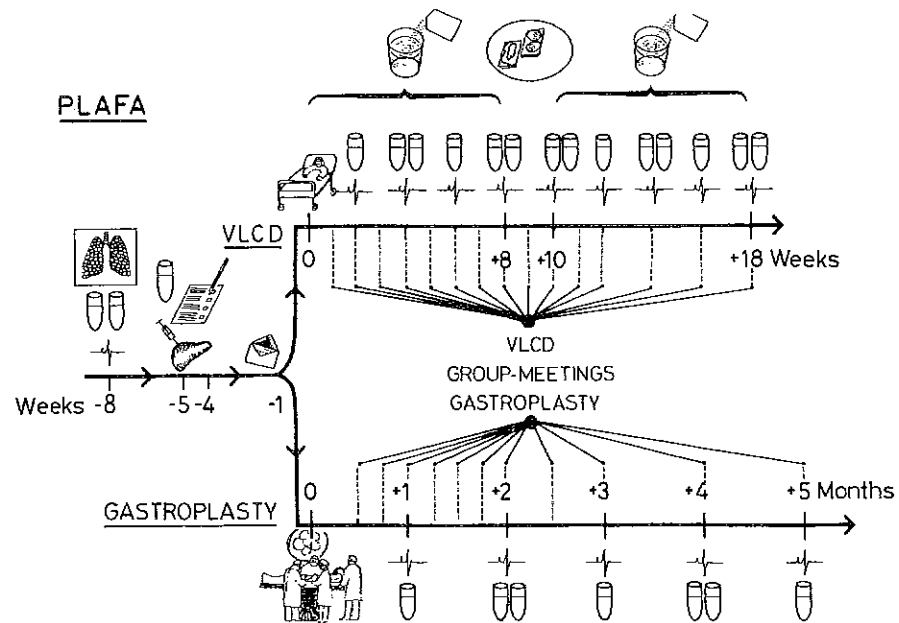


Fig. 1. Randomized trial comparing horizontal gastroplasty with very low calorie diet given for indefinitely repeated 8 weeks periods interrupted by 2 weeks of conventional low calorie diet. Flow chart for the first 5 months.

vertical banded gastroplasty is so far the best approach for long-term maintenance of weight loss. It is also pointed out that the physiological reasons for the mode of action of Mason's operation are incompletely understood: weight loss is not explained merely by factors such as pouch volume, emptying time and stoma diameter⁸.

Apart from its safety, the main advantages of VLCD for the very obese are the following: weight loss is rapid and therefore encouraging; the regime is simple and easy to understand; and in many patients there are surprisingly few complaints of hunger. In the patients who do complain of hunger after the first few days, we have in a randomized trial seen excellent results after having added 30 g of fibre to the daily ration of nutrition powder⁹. This trial also showed that the patients' feeling of constipation was relieved. All these factors contribute to a compliance which is far better than one might expect beforehand. Compliance is also improved by frequent controls and by treatment being conducted in groups. The latter principle saves resources and has obvious psychological advantages.

In a very obese person, normalization of weight, and even a clinically worthwhile weight loss, takes so long on a conventional diet that the patient is likely to give up at an early stage.

Also, there are large groups of patients with lesser degrees of obesity, for whom the time factor is important: we routinely use VLCD in situations where a speedy weight loss is needed to ameliorate the sequelae of obesity: hypertension, cardiac or pulmonary failure, diabetes etc. Another very important group suitable for VLCD are the numerous obese patients – many of them elderly – who are in need of surgery and should not wait too long for it – most often operations on osteoarthrotic hips and knees, and on external or internal herniations.

In this context one may mention another age group as candidates for VLCD: moderately overweight women who need plastic surgery for the burdensome condition of hypertrophic breasts.

The opponents of VLCD seem to imply that it is of no matter whether target weight is

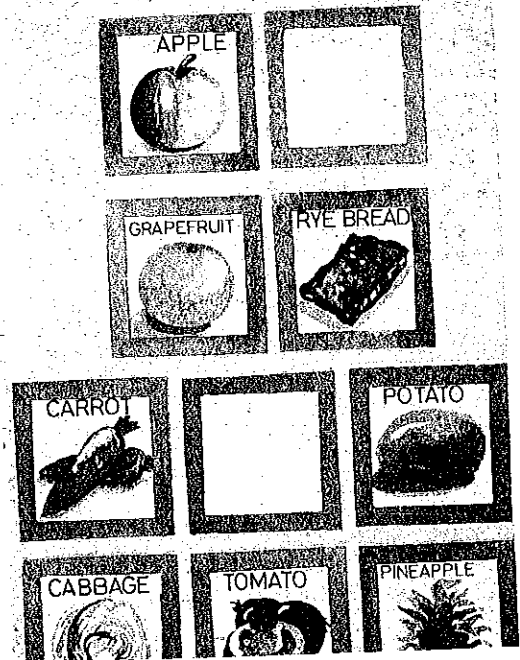
VISUALIZATION OF PORTION

(CUT OR HELPING)

62.5 Kcal/0.26 MJ



GREEN FIBRE UNITS
(62.5 Kcal)



"CAKES AND ALE" UNITS

RED

ONE ORDINARY PORTION = 2 UNITS



Fig. 2a, b, c. The "counter system": various ways of conceptualizing portions (units) of food and drink.

expected or arrived at after 12 weeks or after 12 months. Also, compliance is not necessarily better on low than on very low calorie diets.

Seldom, if ever, is a person excluded beforehand from VLCD because of a somatic abnormality. With regard to control: the economic costs for patient and community are low. We also feel that the fear of VLCD risks is exaggerated. We formerly monitored our VLCD patients very closely, often weekly. However, as through many years we saw no serious

adverse events at all, we have long ago loosened our control. We monitor the relevant laboratory parameters and ECG at the beginning of the treatment, and we only re-examine them if they are abnormal – most often in order to be able to tell the patient that her blood glucose and lipid profile are normalized or ameliorated.

Our only real concern is about potassium, and our policy on thiazides and loop diuretics is very strict. If they cannot be discontinued, we advise potassium supplementation and control of serum levels with individualized intervals. Also, obese diabetics treated with insulin or sulphonylurea must be under medical supervision during VLCD to avoid hypoglycaemia.

The concept and application of VLCD in the strict sense of the word, i.e. a nutritionally complete formula diet as sole source of nutrition, has been a major breakthrough in obesity treatment. As I have mentioned, there are a great number of situations where VLCD should be the therapy of first choice.

Up till now I have dealt only with the traditional and original use of formula diet, i.e. as sole source of nutrition. In the following I shall outline the merits of VLCD in quite another role, – a role that has received much less attention than it deserves. In my opinion, by far the most important application of VLCD has been our extended use of it as the mandatory basis in less energy-restricted diets, usually in the order of 1000-1100 kcal (4.2–4.6 MJ). By means of the so-called “counter system”, we provide dietetic education, verbal, written and in pictures: all food and drink is divided in fairly big (about 63 kcal, 263 kJ) units, visualised by pictures (“counters”) and recognizable by colour: blue for high protein content, green for high content of starch and fibre, and red for high content of sugar, fat or alcohol. On condition that the prescribed daily ration of formula diet is taken, it is justified to permit a free choice of additional food and drink, including less valuable items, as long as the energy allowance is small enough to induce weight loss. Renunciation of popular foods and beverages such as fats, cake, sweets, beer, wine and spirits is one major reason why many obese patients do not attempt to diet or, if they do, break the diet or withdraw from treatment.

In a randomized trial¹⁰ we have evaluated such an untraditional 1000 kcal (4.2 MJ) regimen, in which a fundament of our formula diet was obligatory, but the patients were totally free to manage their remaining energy budget of about 600 kcal (2.5 MJ). The control group were prescribed an isoenergetic conventional diet with its usual restrictions in popular ingredients. To make up for it, they were allowed an anorectic (diethylpropion up to 75 mg daily). After 12 weeks, weight losses were slightly better in the conventional group, but not significantly so. The striking finding was that the drop-out rate on conventional diet plus anorectic was significantly greater than in what we might call the “cakes and ale” group. We should also bear in mind that the “conventional” patients who dropped out can be assumed to have had poor weight losses. On an average, the freedom of the formula diet group was not mismanaged: the proportion of “cakes and ale” items of the total energy intake was in the order of 10%, admittedly with great individual variation (0–55%).

Over the years, numerous reassuring findings such as these have prompted us to use the pragmatic approach: a free – though small – energy budget combined with the safety net of VLCD, in the treatment of the multitude of obese patients whose motivation and compliance tend to be poor for a number of potent reasons: hedonic preferences, pressure from familial, social, professional and cultural environment. We have seen excellent weight losses in elderly patients with ingrained habits, in the very young, who often are not serious and consistent dieters, and also in the numerous males with upper body obesity, who are disinclined totally to give up their cherished preferences.

The mandatory VLCD basis also reduces the risks of private patient experimentation with periods of grossly insufficient regimens or of trying to remedy breaches of a conventional diet by eating less of its valuable items. In several trials we have started the treatment with VLCD for as long time as the patient will accept, which may be several months. After that VLCD is gradually supplemented with, and finally replaced by, ordinary food and drink. We

found that the longer the patients stick to the initial VLCD, the more weight will they lose in the end¹¹.

There are many obese patients who do not eat more sweets and fats than their normal weight and lean peers, and who do not consume more alcohol. Even for those obese persons who do, it is arguable whether a total prohibition is a realistic policy. All things being equal, it seems better to be of normal weight with questionable eating habits than to remain obese with the same habits. Many obese persons have a "normal" relationship to food and drink of hedonic and social value. Often, these items are not the reason for their obesity, and to deny them these enjoyments will be the same as to compromise the therapeutic results beforehand, by increasing the strain already imposed on the patient by the energy restriction in itself.

Still, it goes without saying that the freedom of nutrient choice should be accompanied by thorough dietetic instruction with the aim of ameliorating undesirable eating habits. The "counter system" is well suited for this purpose.

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