

FOCUS ON VERY LOW ENERGY DIETS

IN TYPE 2 DIABETES

The prospect of putting Type 2 diabetes into remission with a very low energy diet has sparked interest among healthcare professionals and the general public. A new paper looks at the current evidence base for the low energy approach

Obesity is a major risk factor for Type 2 diabetes and substantial weight loss can reduce the risk of developing the condition, even when that weight is regained. Weight reduction can also put Type 2 diabetes into remission. Thus, weight loss is an obvious part of the strategy for Type 2 prevention and treatment.

Current guidelines for obesity treatment focus upon gradual weight loss, achieved by changing dietary habits and increasing exercise. This conventional approach achieves less weight loss than bariatric surgery, weight loss medication and more drastic reduction in calorie intake. Very low energy diets (VLEDs – fewer than 800 calories per day) can lead to substantial weight loss in those without Type 2 diabetes and have fewer side effects and complications than bariatric surgery. It is not known, however, whether VLEDs are as effective among those

with Type 2 diabetes as among the general population.

Obese people with Type 2 diabetes do tend to find it harder to lose weight in obesity treatment than those without the condition. But a recent trial showed an exception for a community-based 12-week VLED where such individuals managed to lose almost as much weight as people without Type 2 diabetes. Also, a weight loss of 15–20 per cent has been shown to normalise pancreatic function and thus put Type 2 diabetes into remission.

If this work is to be built on, then it is worth exploring the acceptability of VLEDs as a starting point. Thus far, little is known about this aspect of the low energy approach, as previous reviews included only a small number of studies or had too broad a focus. In this new review, researchers at Newcastle University looked at controlled trials using VLEDs in overweight or obese people with Type 2 diabetes from the

point of view of efficacy, glycaemic control, weight loss and acceptability. The findings could help optimise this type of intervention in the future.

VLED evidence

The researchers looked for published and unpublished randomised controlled trials (RCTs) and non-randomised controlled trials (non-RCTs) of the efficacy and acceptability of VLEDs in overweight or obese individuals with Type 2 diabetes. The outcomes were: weight loss, fasting blood glucose (FBG), adherence, attrition rates, adverse effects and change to medication. The researchers employed standard search, data extraction and assessment criteria to perform meta-analyses on the RCTs and non-RCTs. The search turned up 4,735 records, of which 113 were selected for more detailed assessment. From these, nine were finally selected for full analysis. These comprised four RCTs and five

“A weight loss of 15-20 per cent has been shown to normalise pancreatic function and thus put Type 2 diabetes into remission”

non-RCTs, covering a total of 346 participants aged between 40 and 70 years, with body mass index ranging between 30 and 51 kg/m².

Three of the studies compared different VLED delivery modes with additional intervention components. These were: VLED compared with VLED with an evening meal; VLED compared with VLED plus exercise; different modes of intermittent VLED compared with restricted diet behaviour therapy. The other studies compared VLEDs with other interventions (low energy diet, gastric surgery, intensive diet/exercise). The length of the VLED varied from 20 days to 24 weeks.

Weight loss on VLEDs

1 VLED vs standard care. Two studies gave enough details on weight loss to allow three and six month meta-analysis. At three months, those on VLED had lost a (non-significant) median of 7.38kg compared with controls. At six months, weight loss did reach significance at a median of 8.48kg.

2 VLED vs low energy diet. There

were two studies showing that significant weight loss was achieved by those on the VLED diet compared with those on a low energy diet at both three and six months (median loss 6.57kg and 5.74kg respectively).

3 VLED vs gastric bypass. Short-term data from two studies showed a non-significant difference in weight change between the two arms.

4 Different intensities of VLED. One study compared full meal replacement VLED with VLED including an evening meal. There were no differences in weight loss (median 1.6kg) at three months. Another compared VLED with VLED plus exercise. Here there was a significant difference at three months, favouring the latter group.

Blood glucose

1 VLED vs standard care. In one study, there were no significant differences in FBG at one, three, six and 12 months (with median decreases ranging from 5.1mmol/l to 1.2mmol/l).

2 VLED vs low energy diet. In one study, there were no significant

differences in FBG beyond four months between the two arms. At two years, glycaemic control returned to baseline in both arms.

3 VLED vs gastric bypass. Two studies showed a significant difference in FBG in favour of VLED at three weeks but this was not sustained at three months.

Attrition & other issues

Information on the number of participants lost to follow-up (which could reflect on acceptability of the intervention) was available in two studies comparing VLED with standard care, in two comparing VLED with lower energy diet and in two comparing VLED with gastric bypass. Attrition rates did not differ between any of the groups in these studies.

Significant reductions in depression and anxiety were found in the VLED and low energy diet – both with behaviour therapy – studies. VLED and VLED plus exercise were found to improve physical functioning, physical ability, energy, health and activity.

Five of nine studies reported adverse

Nutritionally balanced soups and shakes are a form of VLED

“Overall findings of this study suggest that VLEDs do lead to considerable weight loss”



effects of treatment, including headaches, hunger and fatigue, which were not significantly different between the intervention and control arms. One study reported on cost-effectiveness, finding significant prescription savings among people on VLEDs.

Discussion

The overall findings of this study suggest that VLEDs do lead to considerable weight loss. There is also a dose-response relationship between weight loss and improved glycaemic control. However, there remains uncertainty about the underlying mechanisms. There is also a lack of evidence on the long-term efficacy of VLEDs. The meta-analyses done here are based on only a very small number of studies and small sample sizes.

This paper found VLEDs to be as acceptable as other weight loss approaches, but with the caveat that

there was limited reporting of adverse effects in the studies available.

Adherence to a VLED is crucial to get maximum benefit from it. Greater initial weight loss does help weight maintenance long term, if there is an effective maintenance programme in place. There is no evidence that rapid weight loss via VLED is associated with more rapid weight gain than more gradual weight loss, so the loss should be a sustainable one. But more studies with long-term follow-up are needed to explore the link between rapid or gradual weight loss and weight regain. There is also a need for more research into the impact of different weight loss methods upon Type 2 diabetes outcomes.

The low attrition rates suggest that either the individuals involved were highly motivated or that adherence to a VLED is not as demanding as previously thought (or both). It should also be borne in mind that attrition rates may not be

the best indicator of the acceptability of a weight loss method.

The authors conclude that more high-quality studies are needed to see whether the VLED approach can be more widely applied for Type 2 diabetes primary care and public health. In particular, participants' experience should be explored to identify the barriers or facilitators to successful weight loss.

i This is a digested version of **Rehackova L, Arnott B, Araujo-Soares V et al (2016). Efficacy and acceptability of very low energy diets in overweight and obese people with Type 2 diabetes mellitus: a systematic review with meta-analyses. *Diabetic Medicine* 33 (5); 580–591. To download the article, go to: <http://onlinelibrary.wiley.com/doi/10.1111/dme.13005/pdf>**

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