

Cambridge®

Weight Matters

Issue 6

A regular digest of obesity related news for health professionals

CAMBRIDGE
VLED CAN CURE
OR IMPROVE
SLEEP APNOEA



NEW SLEEP APNOEA RESEARCH Published from Stockholm

Swedish scientists at the Karolinska Institute in Stockholm (above) have shown that a Cambridge very low-energy diet (VLED) can improve, and even cure, some people who have moderate or severe sleep apnoea. The paper was published in the British Medical Journal (BMJ) in December 2009 and has generated interest in the need for introducing effective weight loss into the care pathway for people with sleep apnoea.

Obstructive sleep apnoea (OSA) is said to be present when the airflow through the mouth and nose stops for more than ten seconds at least 30 times during a seven-hour sleep. Sometimes, but not often, this can be due to problems in the part of the brain which controls breathing. In obstructive sleep apnoea it is caused by blockage of the airway by collapse, due to extra amounts of fat tissue next to the airway and failure of the muscles to hold the airway open. Some surveys suggest that one in four people with diabetes mellitus may have OSA, others that four out of five obese people with diabetes may be affected. There is uncertainty about the rate of OSA in the general population; perhaps one in 25 is affected, maybe more. Obstructive sleep apnoea can be a factor in causing raised blood

pressure. Those who have suffered from but survived a stroke, often give a history showing they had sleep apnoea before they had their stroke. Sleep apnoea is thus a condition which is best avoided.

Does sleep apnoea matter?

OSA causes snoring interrupted by pauses in breathing, choking and gasping during sleep, restless sleep, excessive daytime sleepiness and perhaps falling asleep at work or while driving a motor vehicle. Quality of life may be seriously impaired by general fatigue, poor concentration, irritability, forgetfulness, morning headaches, depression and sexual dysfunction.



Losing 10–20kg of body weight may enable some people to discontinue their use of CPAP.

Driving and sleep apnoea

Falling asleep while driving may result in serious injury or death to the driver and passengers, as well as those in other vehicles involved in the accident.

A driver, whether professional or not, who is overweight or obese and believes that he or she is affected by sleep apnoea should consult his or her medical practitioner and consult the regulations applicable in their country of residence. In the United Kingdom these may be seen at the DVLA website by visiting www.direct.gov.uk/en/Motoring/DriverLicensing/MedicalRulesForDrivers/DG_4022415. Employers of professional drivers have a duty of care to their employees and their passengers and should work with occupational physicians to detect and treat OSA.

What causes sleep apnoea?

Factors linked to OSA include variations in the shape and size of the upper airway, being overweight and obese and having a family history of OSA. Scientific studies have shown that in OSA the airway is narrowed and that there is more fat next to the airway in those who are overweight and obese. The muscles supporting the airway may be less good at holding the airway open, allowing it to collapse and obstruct.

Weight loss in mild Obstructive Sleep Apnoea

A recently published study reports a randomised controlled trial undertaken in Finland by Tuomilehto et al (2009) of a Very Low-Energy Diet with supervised lifestyle modification compared to routine counselling in 72 overweight patients with mild OSA. At the end of one year, the group treated initially with VLED (n=35) lost an average 10.7kg body weight, compared to a loss of 2.4kg in the routine counselling group (n=37). The number of apnoea-hypopnoea episodes was reduced significantly in the VLED group by four, compared to a slight rise in the routine counselling group. Other measures of severity of sleep apnoea were also improved significantly in the VLED group, compared to the routine counselling group.

A recently published study from the USA has shown that people with diabetes and sleep apnoea who lose more than 10kg with formula diet and who maintain that weight loss for one year, also maintain the improvement in sleep apnoea. (Foster et al 2009). What was lacking until December 2009 was good high quality research in the form of a randomised controlled trial of weight loss in people with moderate or severe sleep apnoea.

The latest research

Johansson and colleagues at the Karolinska Institute in Stockholm reported that sixty-three obese Swedish men with moderate and severe OSA were allocated to one of two groups. Thirty men followed a seven-week Cambridge VLED (554 kcal/d) followed by two weeks of rising dietary energy intake in preparation for a one year maintenance programme, and thirty-three men (the control group) received no treatment and followed their usual diet.

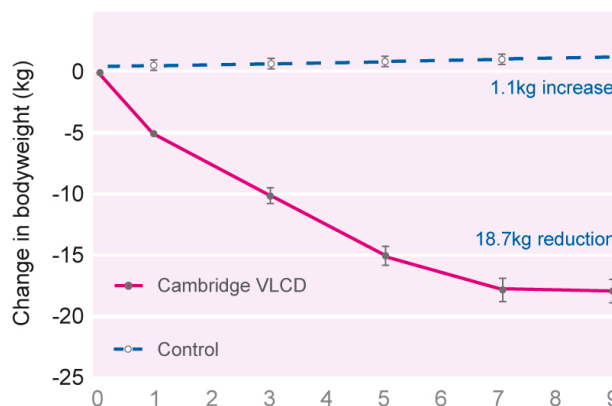


Figure 1. Change in body weight.

In the Cambridge VLED treated group:

- average weight loss was 18.7kg (average baseline weight was 113.4kg). Fig 1.
- there was a 3.8cm reduction in neck circumference (baseline was 45.1cm). Fig 2.
- a little over one quarter of body fat (30.1 percent at baseline) was lost by nine weeks. Fig 3.
- 22 out of 30 were not obese (BMI under 30) after nine weeks.
- five improved sufficiently to be classed as ‘cured’ of their OSA. Fig 4.
- 26 out of 30 saw improvement in their OSA. Fig 5.
- no one dropped out from the VLED treated group (in contrast, two subjects out of 33 dropped out from the control group).

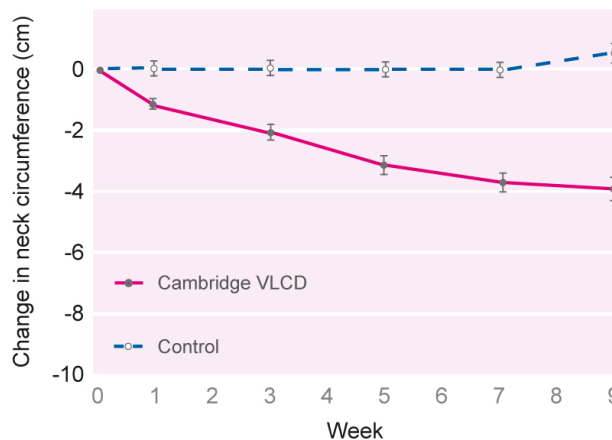


Figure 2. Change in neck circumference.

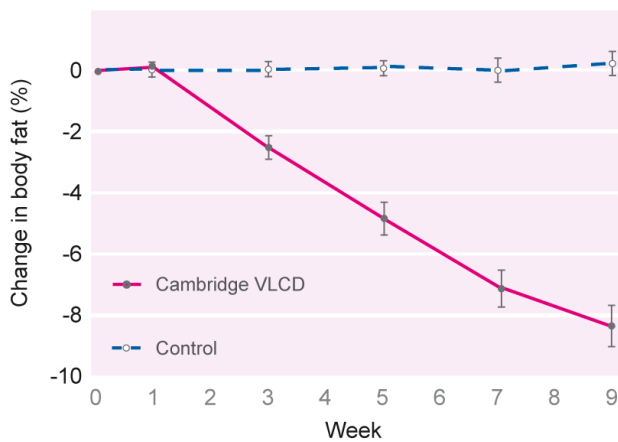


Figure 3. Change in body fat (%).

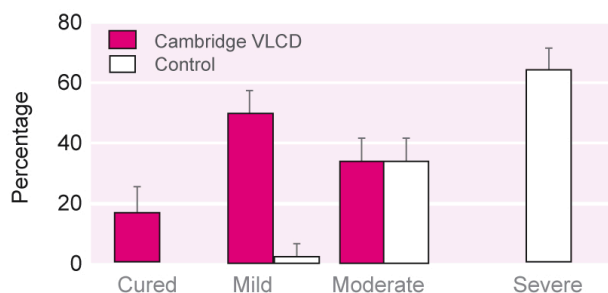


Figure 4. Proportion of patients with cured, mild, moderate and severe obstructive sleep apnoea at nine weeks.

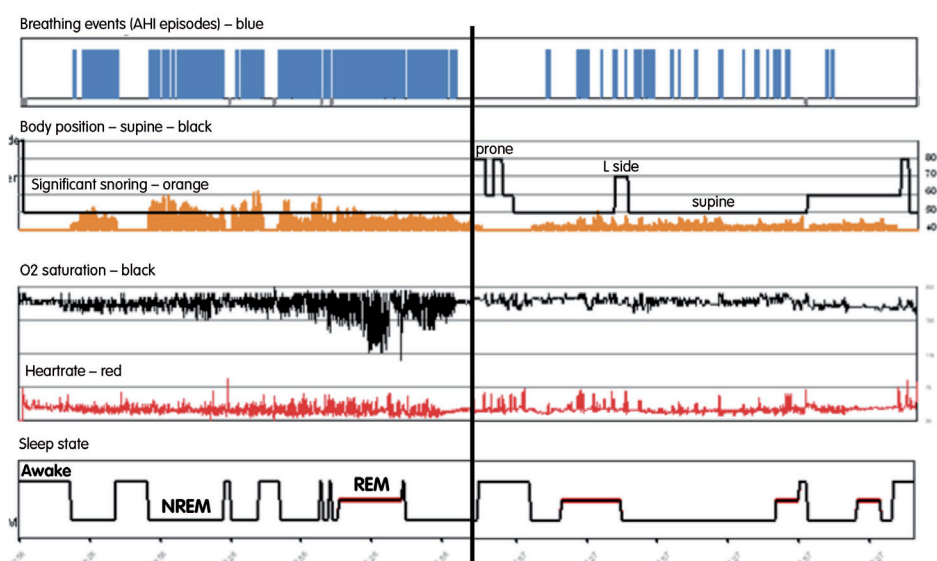
In the control group there was a small weight gain of 1.1kg (average) and very slight increases in neck circumference and body fat.

Four subjects saw improvement in their OSA, five deteriorated and 24 out of 33 stayed unchanged. The differences between the VLED group and the control group were highly significant. One example from this study is shown in figure 7, which illustrates a sleep study before and after weight loss. The reduction of apnoea-hypopnoea index (AHI) episodes and snoring is clearly visible and the 'normalisation' of the recordings of pulse rate and oxygen saturation following weight loss are clear.

Figure 6. Sleep studies recorded in a case of obstructive sleep apnoea in an obese man (initial weight 120kg, BMI 34) with baseline apnoea hypoapnoea index of 57/hour [baseline recording on the left and recording after weight loss on the right].

After a nine-week programme (seven weeks of VLED and two weeks of dietary stabilisation) he had lost 14kg and his AHI index was 3/hour. Significant snoring time had been reduced from 38 to 2 percent of time and the nadir oxygen concentration had been raised from 78 percent to 92 percent.

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This paper is important because:

- it is the first (and only) published randomised controlled trial of VLED in moderate and severe sleep apnoea.
- it provides high quality evidence that a relatively short period of VLED diet can result in effective weight loss and improve OSA in a majority of patients.

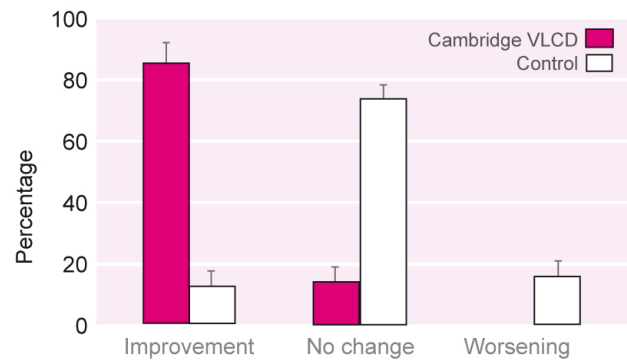


Figure 5. Proportion of patients with improved, maintained or worsened obstructive sleep apnoea after nine weeks. The solid columns show that more than 80 percent improved on Cambridge VLCD, whereas most control subjects were unchanged or deteriorated slightly.

The importance of weight maintenance

These results are very exciting but the question remains: can the weight loss and benefit to the OSA severity be maintained?

The Swedish research subjects are now following a one-year weight maintenance programme, results from which should be available late in 2010. In the meantime, the existing evidence suggests strongly that if the right maintenance programme is put in place, then the results at one year may well be very encouraging.

Anthony R Leeds, Medical Director
Cambridge Weight Plan, 2010

References:

Johansson K, Neovius M, Lagerros YT, Harlid R, Rossner S, Granath F, Hemmingsson E. Effect of a very low-energy diet on moderate and severe obstructive sleep apnoea in obese men: a randomised controlled trial. *BMJ* 2009; 339: b4609 doi 10.1136/bmj.b4609

Foster DG, Borradaile KE, Sanders MH, et al. Randomised study on the effect of weight loss in obstructive sleep apnoea among obese patients with type 2 diabetes. *Arch Int Med* 2009; 169 (17): 1619-1626

Tuomilehto HPI, Seppä JM, Partinen MM et al. Lifestyle intervention with weight reduction: first line treatment in mild obstructive sleep apnoea. *Am J Respir Crit Care Med* 2009; 179: 320-327.

Figures 1 to 5 are redrawn from Johansson K, et al. *BMJ* 2009; 339: b4609 doi 10.1136/bmj.b4609.



What is Cambridge Weight Plan?

Until recently known as the 'Cambridge Diet', the programme is synonymous in the minds of many healthcare practitioners with very low-energy diets (VLEDs).

Developed by Dr Alan Howard as a formula VLED, this does remain the greater part of its present day usage. However, about ten years ago it evolved into a more flexible series of dietary energy intake levels (1500, 1200, 1000, 810, 615, 415 kcal/d), allowing titration of energy intake against the client or patient's response.

This is interesting historically, because in the late nineteenth century a step-wise titration upwards of dietary energy was offered to people with diabetes, following a fast to clear

the urine of reducing sugars. Now, this remarkably precise titration process (precise because it includes formula food products rather than non-formula foods alone) can be applied with a step-wise reduction or increase of energy intake according to need.

Very low-energy diets give the most effective weight losses, but sometimes a part formula and part food diet can achieve remarkable weight loss. Dietary adherence tends to be less good at the higher energy intake levels and patients tend to

be more hungry, but nevertheless energy intake levels above 800kcal/d can give good results. The gradually accumulating scientific literature on the efficacy of VLEDs indicates that it is highly likely that the potential applications of VLEDs and part-food, part-formula food low-energy diets (LEDs above 800kcal/d) will be more widely appreciated. The 2000s may well be the decade of bariatric surgery, but the 2010s could be the decade of effective diets.

Contact us ...

If you would like to know more about Cambridge Weight Plan, please contact Teresa Collier, Medical Sales Manager, on **07584 503527**.

