National Diabetes Institute Malaysia
Diabetes Asia 2010 Conference October 6th to 10th 2010 Kuching, Sarawak, Malaysia

Abstracts

Sleep Apnoea, Obesity and Diabetes – Mechanisms and Treatment

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Sleep apnoea affects 26% of people with type 2 diabetes mellitus in the United Kingdom and has an even higher prevalence in the USA where 86% of obese people with diabetes who are seeking help with their weight are affected. Causing interrupted sleep, severe snoring and high blood pressure during sleep and increased risk of stroke, daytime sleepiness and falling asleep while driving, sleep apnoea can be diagnosed by undertaking recording of respiratory movement, blood oxygen tension, eye movements, blood pressure and snoring during a sleep study. Diagnosed and classified by the number of interruptions to air flow in the respiratory tract standard treatment, after exclusion of specific structural abnormalities in the upper airway, is with positive pressure ventilation using a nasal or face-mask. This standard treatment (CPAP) is effective in many cases but is not tolerated by all patients. Reduction of body weight has been known to improve symptoms of sleep apnoea for some years but only in 2009 were the results from randomised controlled trials published. Johansson et al (2009) showed that a formula very low-calorie diet for seven weeks followed by two weeks of a 1200kcal/d diet in preparation for maintenance reduced average body weight by 18.7kg and improved measures of sleep apnoea severity in 26 out of 30 subjects to the extent that 5 of the 26 were technically 'cured'. Johansson et al recently announced that results of a one year maintenance study following weight loss with VLCD showed that most of the sleep apnoea symptom benefit was maintained for one year. Any obese individual with type 2 diabetes and obstructive sleep apnoea should be offered effective weight loss. The symptomatic benefit is highly motivating and this may well drive determination to maintain the weight loss.

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

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VLCD and formula LCD for diabetes - where are we now?

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Most patients with type 2 diabetes mellitus are overweight, insulin resistant and on a one-way path towards cardiovascular, eye and renal complications. Effective reduction of dietary energy intake can reduce body weight, fat, insulin resistance, and cardiovascular risk factors. At the appropriate stage in the natural history of diabetes, effective weight loss (15kg in Europeans) and weight maintenance may dramatically alter the course of the disease. Most recent scientific evidence for weight reduction in patients with type 2 diabetes reports effects of surgical treatments, where gut hormone changes may confound the simple effects of reduced dietary energy absorption.

While there is still a need for good quality randomised controlled trials in diabetes there is no doubt that a compliant patient following a very low-calorie diet (VLCD) can lose weight. Recently reported studies in men with moderate and severe sleep apnoea show that compliance can be good and clinical benefit worthwhile (Johansson K et al 2009) – it must be remembered that a proportion (25% in the UK) of people with type 2 diabetes have sleep apnoea.

Almost all older patients with type 2 diabetes have some degree of osteoarthritis which impairs mobility and therefore undermines compliance during a weight loss programme. Formula LCD and VLCD have been shown to cause effective weight loss and increased mobility in this difficult group (Riecke BF et al 2010, Christensen R et al 2010). Nutritional status may be improved by use of formula product and improved vitamin D status may have beneficial effects on muscle strength as well as bone and vascular tissue (Christensen P et al 2010).

Translation into routine practice has already begun in Scotland in the north of the UK in a feasibility study where most participants (with BMI >40) in a primary care setting lost 20kg in 8 to 12 weeks.

Weight loss of this order of magnitude improves mobility, metabolic and psychological state, may reduce medication costs and ultimately social-care costs, and the programmes are not hugely expensive to deliver. Health care providers would do well to watch this area for potential savings through effective weight loss.

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- Christensen R, Leeds AR, Lohmander S, Christensen P, Riecke BF, Sørensen TJ, Gudbergsen H, Aaboe J, Henriksen M, Boesen M, Astrup A, Bliddal H. **Efficancy of dieting or exercise vs control in obese osteoarthritis patients after a clinically significant weight loss: a pragmatic randomized controlled trial.** Obesity Reviews 2010; 11 (suppl 1): 248 (T3:PO.83).

- Riecke BF, Christensen R, Christensen P, Leeds AR, Boesen M, Lohmander LS, Astrup A, Bliddal H. **Comparing two low-energy diets for the treatment of knee osteoarthritis symptoms in obese patients: a pragmatic randomized clinical trial.** Osteoarthritis and Cartilage 2010; 10/1016/j.joca.

- 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 .

Declaration of Interests: A R Leeds is employed as medical director of Cambridge Weight Plan.

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Closing Remarks

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Very low-calorie and formula low-calorie diets have been available for more than 25 years. In clinical practice there is a 'therapeutic void' – there is nothing to offer the patient who needs to lose 10 to 30kg other than through use of bariatric surgery.

Weight losses of 10 to 30kg followed by weight maintenance of at least 10kg for one year are possible using formula diet with effective education followed by sufficient physical activity, adequate support and dietary control which may be facilitated by partial use of formula food products.

Weight loss of more than 10kg with medical benefit has been shown in men with moderate or severe sleep apnoea and in men and women with knee osteoarthritis and maintenance of more than 10kg for one year has been show in both sleep apnoea patients and people with knee osteoarthritis, with maintenance of health benefits in both cases. Lean tissue losses are less than expected and some measures of nutritional status improve. Earlier work in Diabetes and recent case studies suggest a clear potential in Type 2 diabetes mellitus.

These and other findings may revolutionise the care pathways for osteoarthritis, sleep apnoea, diabetes and some preoperative preparation needs. Health care costs may be reduced and quality of life may be improved for some patients by wider use of this relatively inexpensive approach.

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