

Diabetesity Digest

Diabetesity Digest summarises recent key papers published in the area of coexistent diabetes and obesity – diabetesity. To compile the digest a PubMed search was performed for the 3 months ending December 2011 using a range of search terms relating to type 2 diabetes, obesity and diabetesity. Articles have been chosen on the basis of their potential interest to healthcare professionals involved in the care of people with diabetesity. The articles were rated according to readability, applicability to practice, and originality.



Think about OSA: It could help improve glycaemic control and quality of life

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The article by Pillai et al (2011; summarised alongside) explores the common problem of obstructive sleep apnoea (OSA) and raises a number of questions of immense clinical, and potentially practice-changing, importance.

The observational, cross-sectional study follows 52 consecutive, high-risk people in a diabetes and obesity unit, and neatly links together the three conditions, with glycaemic control deteriorating with increasing severity of OSA.

On the surface, this isn't particularly surprising as obesity underpins the other two conditions, in particular neck circumference in the case of OSA. However, the discussion section reviews articles by Babu et al (2005) and Coughlin et al (2007) which suggest that HbA_{1c} reductions can be brought about by continuous positive airway pressure (CPAP) therapy. In some ways, however, even this is unremarkable, as energy levels increase and physical activity improves after treatment. Or is it remarkable? Someone on CPAP will no longer sleep through their meals, and will have more opportunity to disobey the energy balance equation by eating in front of the TV instead of sleeping.

The article suggests both a direct and an indirect mechanism of CPAP reducing HbA_{1c} levels and that lifestyle is probably enhanced. But actually that's neither here nor there, because the main purpose of the article is to highlight OSA to a blindfolded audience. Only 15% of cases are ever diagnosed with only a 1.5% chance of the condition being picked up at consultation (De Silva, 2009). QOF provides no help as screening for it in obese people or those with diabetes isn't incentivised, and people who often know very well that they have OSA won't present for fear of losing their driving license.

So the main message is "think about OSA". Managing it will improve a person's quality of life, and might help control their diabetes, as well as blood pressure and risk of stroke. OSA is simple to screen for, and managing it can be life-changing for the individual. Diabetesity, and even the metabolic syndrome, mean a great deal more than sugar and weight. ■

Babu A, Herdegen J, Fogelfeld L (2005) Type 2 diabetes, glycemic control, and continuous positive airway pressure in obstructive sleep apnea. *Arch Intern Med* 165: 447-52

Coughlin SR, Mawdsley L, Mugarza JA et al (2007) Cardiovascular and metabolic effects of CPAP in obese males with OSA. *Eur Respir J* 29: 720-7

De Silva B (2009) Obesity and obstructive sleep apnoea (OSA). Presentation at: *National Obesity Forum 2009 Annual National Conference*, 5-6 October, London

Diabetes Technology and Therapeutics

Increased sleep apnoea severity worsens glycaemic control in people with T2D

Readability ✓✓✓
Applicability to practice ✓✓✓
Originality ✓✓✓✓

1. The effect of obstructive sleep apnoea (OSA) severity on glycaemic control in T2D is unclear.
2. This observational cross-sectional study therefore assessed the association between OSA severity and HbA_{1c} level in 52 consecutive people with T2D attending a joint diabetes-obesity clinic between January 2008 and February 2010.
3. Fifty-eight percent of participants had OSA; increased OSA severity was significantly associated with increased HbA_{1c} levels ($P < 0.014$ for linear trend), after adjusting for age, gender, BMI, diabetes duration and insulin dose.
4. HbA_{1c} increases plateaued at moderate to severe OSA levels. Mean HbA_{1c} levels in each OSA category were: 70.71 mmol/mol (8.62%) for none, 78.79 mmol/mol (9.36%) for mild, and 92.45 mmol/mol (10.61%) for moderate, and 84.81 mmol/mol (9.91%) for severe OSA.
5. No significant associations were observed between OSA severity and liver transaminase level or BMI, or between HbA_{1c} level and Epworth score.
6. The authors concluded that increased severity of OSA is independently associated with worsening glycaemic control in people with T2D.

Pillai A, Warren G, Gunathilake W, Idris I (2011) Effects of sleep apnoea severity on glycaemic control in patients with type 2 diabetes prior to continuous positive airway pressure treatment. *Diabetes Technol Ther* 13: 945-9

Journal of Endocrinology and Metabolism

Weight-beneficial therapies should be considered in people with T2D

Readability ✓✓✓✓
 Applicability to practice ✓✓✓✓
 Originality ✓

1. The authors undertook a literature review of PubMed to examine the impact of "weight-friendly" T2D therapies and to suggest strategies to reduce weight gain.
2. The evidence was found to confirm the weight-lowering effects of metformin, glucagon-like peptide-1 (GLP-1) receptor agonists and

amylin analogues, and the weight-neutral effects of dipeptidyl-peptidase-4 (DPP-4) inhibitors.

3. The following treatment choices were recommended: long-acting GLP-1 receptor agonists, DPP-4 inhibitors, bile acid sequestrants, amylin analogues, and basal insulin for people with elevated fasting plasma glucose levels; and short- or long-acting GLP-1 receptor agonists, amylin analogues, DPP-4 inhibitors, acarbose, and bile acid sequestrants for those with elevated postprandial glucose levels.
4. The authors concluded that weight-beneficial agents should be considered in people (particularly obese people) with T2D who fail to achieve optimal glycemic control on metformin.

Meneghini LF, Orozco-Beltran D, Khunti K et al (2011) Weight beneficial treatments for type 2 diabetes. *J Clin Endocrinol Metab* 96: 3337–53

Diabetes Care

Maternal health linked to offspring obesity and fasting glucose levels

Readability ✓✓
 Applicability to practice ✓✓
 Originality ✓✓✓✓

1. This study assessed the effect of maternal diabetes status on offspring outcomes at adolescence.
2. After analysis of obstetric data ($n=2563-4198$ for different outcomes), and offspring outcomes at a mean age of 15.5 years, gestational diabetes (GD), existing diabetes (ED) and glycosuria were associated with higher offspring BMI and fat mass, although this effect was attenuated after adjustments.
3. ED and GD were associated with higher offspring fasting glucose levels.
4. There was little evidence for an association between ED or GD with offspring blood pressure, lipids or C-reactive protein.
5. It was concluded that ED, GD and glycosuria were associated with higher offspring fasting glucose and insulin levels, but not with a wider range of cardiometabolic risk factors.

Patel S, Fraser A, Davey Smith G et al (2011) Associations of gestational diabetes, existing diabetes, and glycosuria with offspring obesity and cardiometabolic outcomes. *Diabetes Care* 35: 63–71

Diabetes Technology and Therapeutics

Bypass liner improves glycaemic control in obese people with T2D

Readability ✓✓✓✓
 Applicability to practice ✓✓
 Originality ✓✓✓✓

1. The authors evaluated the effect of a duodenal-jejunal bypass liner (DJBL) on metabolic parameters in 22 people with T2D (mean BMI, 44.8 ± 7.4 kg/m²).
2. A total of 13 people completed the 52-week study. Using last observation carried forward (LOCF), significant mean reductions were observed in body weight (–35.5%), fasting blood glucose (–30.3 mg/dL [–1.68 mmol/L]), fasting insulin (–7.3 μ U/mL) and HbA_{1c} levels (–23 mmol/mol [–2.1%]).
3. By week 52, 16 of the 22 people (LOCF) had an HbA_{1c} level of <53 mmol/mol (7.0%) compared with one at baseline.
4. The authors concluded that DJBL improved glycaemic control in this cohort of obese people with T2D.

de Moura EG, Martins BC, Lopes GS et al (2012) Metabolic improvements in obese type 2 diabetes subjects implanted for 1 year with an endoscopically deployed duodenal-jejunal bypass liner. *Diabetes Technol Ther* 14: 183–9

Current Medical Research & Opinion

Exenatide twice-daily is clinically effective in a real-world setting

Readability ✓✓✓✓
 Applicability to practice ✓✓✓✓
 Originality ✓✓✓✓

1. This USA-based prospective, multicentre, observational study was designed to assess the effectiveness of the glucagon-like peptide-1 (GLP-1) receptor agonist exenatide (administered twice daily) in a real-world clinical practice setting.
2. A total of 452 people (60% female; mean age, 55 ± 11 years; T2D duration, 9 ± 8 years; HbA_{1c} level, 64 ± 18.6 mmol/mol [$8.0 \pm 1.7\%$]; BMI of 38.2 ± 7.4 kg/m²) were included in the assessment and followed for 12 months.
3. The primary study endpoint was achieving or maintaining an HbA_{1c} level of ≤ 53 mmol/mol ($\leq 7.0\%$), or a reduction of 5.5 mmol/mol (0.5%) from baseline.
4. Secondary endpoints comprised percentage change from baseline levels in lipid markers, BMI, weight and quality of life (QOL; assessed using the Impact of Weight on Quality of Life [IWQOL]-Lite questionnaire).
5. A total of 118 participants had HbA_{1c} measurements available at 12 months, 76.3% of whom achieved the HbA_{1c} target level ($P < 0.0001$); in those with available clinical measurements, a significant improvement was also observed in weight, BMI and QOL.
6. This is the first observational study to prospectively assess the effectiveness of twice-daily exenatide for up to a 1-year period in a real-world, primary care setting.
7. Despite a high discontinuation rate, it was concluded that these results support the clinical effectiveness of twice-daily exenatide observed in previous trials.

Bergental RM, Garrison LP Jr, Miller LA et al (2011) Exenatide BID Observational Study (ExOS): results for primary and secondary endpoints of a prospective research study to evaluate the clinical effectiveness of exenatide BID use in patients with type 2 diabetes in a real-world setting. *Curr Med Res Opin* 27: 2335–42

“Increased severity of obstructive sleep apnoea is independently associated with worsening glycaemic control in people with type 2 diabetes.”