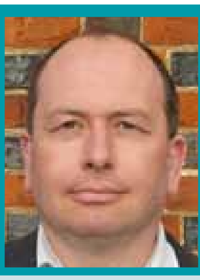
Diabesity Digest

Diabesity Digest summarises recent key papers published in the area of coexistent diabetes and obesity – diabesity. To compile the digest a PubMed search was performed for the 3 months ending February 2014 using a range of search terms relating to type 2 diabetes, obesity and diabesity. Articles have been chosen on the basis of their potential interest to healthcare professionals involved in the care of people with diabesity. The articles were rated according to readability, applicability to practice, and originality.



The need to screen both lean and obese individuals for metabolic abnormalities

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Daniel Lambert weighed 56 stone, yet he was considered to be the fittest specimen of humanity, right up to his death at age 33 in The Waggon and Horses pub in Stamford in 1809. “It was impossible to behold his excessive corpulence without being astonished that he was not suffocated by such an accumulation of fat” (Haslam and Haslam, 2009). Perhaps some undiagnosed underlying condition was the cause of his premature demise?

The obesity paradox suggests that some individuals with heart failure or renal disease are somehow protected against mortality by their excess weight (Curtis et al, 2005), in the same way that an obese Victorian solicitor would consider that his expensive diet and lifestyle awarded him protection against cholera and tuberculosis.

Aung et al’s (2014; summarised alongside) data adds to the “fit but fat” debate, suggesting that metabolically healthy obese people have an increased risk of cardiovascular (CV) disease and diabetes, but so do metabolically unhealthy lean individuals. Their work builds on past findings that, while ≤30% of obese individuals may be metabolically healthy (Blüher, 2012; Hamer and Stamatakis, 2012), some 6.2% of women and 4.6% of men of normal weight have ≥3 features of the metabolic syndrome (Park et al, 2003).

These findings suggest that the “fat but fit” phenotype is, in a significant proportion of individuals, only a transient phenomenon prior to the emergence of illness – as in Daniel Lambert’s case. Thus, Aung et al do not suggest that obese individuals might be spared treatment, but rather that non-obese people who are metabolically unfit should be managed as if they were obese. For this reason, population-level screening for metabolic dysregulation is crucial.

I agree with Aung et al that screening for, and management of, metabolic disturbances should be routine in clinical practice. Despite this, some so-called “experts” in the UK have resisted calls for screening, placing hundreds of thousands of people at risk of avoidable vascular damage. After all, raised blood pressure and lipids are generally asymptomatic, as, very often, is diabetes.

Reasons for failure to introduce screening programmes in the UK have included not wanting to stigmatise people by labelling them as “diabetic”, or that the NHS can not afford to provide care for the 850 000 people with undiagnosed diabetes (Diabetes UK, 2012). It is unsurprising then that as many as 40% of people already have established microvascular complications at the time of diabetes diagnosis (Spijkerman et al, 2003). We can do more for these patients than allow them to remain unscreened and suffering unnecessary vascular damage. ■

Blüher M (2012) Are there still healthy obese patients? *Curr Opin Endocrinol Diabetes Obes* **19**: 341–6
Curtis JP, Selter JG, Wang Y et al (2005) The obesity paradox: body mass index and outcomes in patients with heart failure. *Arch Intern Med* **165**: 55–61
Diabetes UK (2012) *Warning About The One In 70 People Who Have Undiagnosed Type 2 Diabetes*. Diabetes UK, London. Available at: http://bit.ly/1ndlAgi (accessed 22.05.14)
Hamer M, Stamatakis E (2012) Metabolically healthy obesity and risk of all-cause and cardiovascular disease mortality. *J Clin Endocrinol Metab* **97**: 2482–8
Haslam DW, Haslam F (2009) *Fat, Gluttony and Sloth*. Liverpool University Press, Liverpool
Park YW, Zhu S, Palaniappan L et al (2003) The metabolic syndrome: prevalence and associated risk factor findings in the US population from the Third National Health and Nutrition Examination Survey, 1988–1994. *Arch Intern Med* **163**: 427–36
Spijkerman AM, Dekker JM, Nijpels G et al (2003) Microvascular complications at time of diagnosis of type 2 diabetes are similar among diabetic patients detected by targeted screening and patients newly diagnosed in general practice: the hoorn screening study. *Diabetes Care* **26**: 2604–8

J Clin Endocrinol Metab

Risk of type 2 diabetes and CVD in metabolically unhealthy normal-weight and metabolically healthy obese individuals

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

1. The authors examined the risk of both cardiovascular disease (CVD) and type 2 diabetes among metabolically healthy obese (MHO; BMI ≥30 kg/m^2 with ≤1 metabolic abnormality) and metabolically unhealthy normal weight (MUH-NW; BMI <25 kg/m^2 with ≥2 metabolic abnormalities) individuals.
2. Prospective data were sourced from the San Antonio Heart Study – a population-based study of Mexican Americans and non-Hispanic whites with a median follow-up of 7.4 years (age, 25–64 years).
3. Cases of incident diabetes and CVD were assessed in 2814 and 3700 participants, respectively.
4. Logistic regression models showed BMI to be associated with incident diabetes (odds ratio × 1 standard deviation [SD], 1.7 [95% confidence interval (CI), 1.5–2.0]) and CVD (odds ratio × 1SD, 1.3 [95% CI, 1.1–1.6]).
5. Both MUH-NW and MHO individuals had an increased diabetes risk (odds ratio × 1SD, 2.5 [95% CI, 1.1–5.6] and 3.9 [95% CI, 2.0 –7.4], respectively) and incident CVD was also increased (odds ratio × 1SD, 2.9 [95% CI 1.3– 6.4] and 3.9 [95% CI 1.9 –7.8], respectively).
6. The authors concluded that screening for obesity and other metabolic abnormalities should be routinely performed in clinical practice.

Aung K, Lorenzo C, Hinojosa MA, Haffner SM (2014) Risk of developing diabetes and cardiovascular disease in metabolically unhealthy normal-weight and metabolically healthy obese individuals. *J Clin Endocrinol Metab* **99**: 462–8

Diabetic Medicine

Changes in diet and cardiovascular risk factors following diabetes diagnosis: ADDITION-Cambridge trial cohort 1-year results

Readability ✓✓✓

Applicability to practice ✓✓✓

Originality ✓✓

1. Dietary changes in individuals with diabetes may be valuable. However the lack of measurement of diet in previous trials makes quantification of the contribution that dietary change can make to cardiovascular risk reduction in this population difficult.
2. As part of the in the ADDITION (Anglo-Danish-Dutch Study of Intensive Treatment In People with Screen-Detected Diabetes in Primary Care)-Cambridge trial, change in self-reported diet, plasma vitamin C, cardiovascular disease risk factors and modelled cardiovascular disease risk were assessed at baseline (*n*=867) and 1 year (*n*=736).
3. Multivariable linear regression was used to quantify the associations.
4. Participants reported significant reductions in energy, fat and sodium intake that were equivalent to an average-sized chocolate bar per day during the study period.
5. Fruit, vegetable and fibre intake, and plasma vitamin C levels, increased from baseline.
6. Increased vegetable intake was associated with an increase in BMI and waist circumference.
7. Reductions in fat, energy and sodium intake were associated with reductions in HbA_{1c}, waist circumference and total cholesterol/modelled cardiovascular disease risk, respectively.
8. Improvements in dietary behaviour in this population were associated with small reductions in cardiovascular disease risk and may have a role to play in the reduction of cardiovascular disease risk following diagnosis of diabetes.

Savory LA, Griffin SJ, Williams KM et al (2014) Changes in diet, cardiovascular risk factors and modelled cardiovascular risk following diagnosis of diabetes: 1-year results from the ADDITION-Cambridge trial cohort. *Diabet Med* **31**: 148–55

Diabetes Obes Metab

Two diets achieve different HbA_{1c} and diabetes medication effects despite similar weight loss

Readability ✓

Applicability to practice ✓✓✓

Originality ✓✓✓

1. A subset of participants (*n*=46) with type 2 diabetes from a weight-loss study (*n*=146) undertaken at Veterans Affairs clinics in the US were included in the present analysis.
2. Participants were randomised to a 48-week, low-carbohydrate diet (LCD; *n*=22) or a low-fat diet plus the weight-loss drug, orlistat (LFD+O; *n*=24).
3. Mean BMI at baseline was 39.5 kg/m² (standard deviation [SD], 6.5) and HbA_{1c} was 7.6% (SD, 1.3; 59.6 mmol/mol).
4. Although reductions in BMI were achieved with both interventions (LCD –2.4 kg/m² vs LFD+O –2.7 kg/m²; *P*=0.7), LCD led to a significantly greater improvement in HbA_{1c} than LFD+O (–0.7% vs +0.2%; *P*=0.045].
5. Those participants who received the LCD also achieved a greater reduction in the amount of blood-glucose-lowering drugs used (70.6% of LCD vs 30.4% LFD+O participants decreased their medication effect score [based on medication potency and total daily dose] by ≥50%; *P*=0.01).
6. A LCD led to a greater reduction in HbA_{1c} and greater reductions in antidiabetes medications than was achieved with LFD+O. This was achieved despite similar weight loss in both groups. Thus, lowering dietary carbohydrate intake provided benefits for glycaemic control beyond the effects of weight loss.

Mayer SB, Jeffreys AS, Olsen MK et al (2014) Two diets with different haemoglobin A1c and antiglycaemic medication effects despite similar weight loss in type 2 diabetes. *Diabetes Obes Metab* **16**: 90–3

"Lowering dietary carbohydrate intake provided benefits for glycaemic control beyond the effects of weight loss."

Diabetic Medicine

GD predicts childhood overweight independent of maternal obesity

Readability ✓✓✓

Applicability to practice ✓✓

Originality ✓✓✓

1. Data from 7355 mother–child dyads on gestational diabetes (GD) and confounding factors were obtained at school entry health examination.
2. The prevalence of overweight was 21% in children of mothers with GD and 10.4% in children of healthy mothers.
3. Adjustment for maternal BMI and other potential confounders yielded an odds ratio of 1.81 (95% confidence interval [CI], 1.23–2.65) and 2.80 (95% CI, 1.58-4.99) for the impact of GD on childhood overweight and obesity, respectively.
4. The increased risk of overweight in offspring of mothers with GD cannot be explained by maternal BMI alone.

Nehring I, Chmitorz A, Reulen H et al (2013) Gestational diabetes predicts the risk of childhood overweight and abdominal circumference independent of maternal obesity. *Diabet Med* **30**: 1449–56

Diabetes Care

Adiponectin and bariatric surgery: Associations with diabetes and cardiovascular disease

Readability ✓✓

Applicability to practice ✓

Originality ✓✓✓

1. The aim of this study was to analyse the associations between systemic levels of adiponectin and diabetes, myocardial infarction or stroke in a severely obesity population.
2. Serum concentrations of adiponectin in 3299 participants of the prospective, controlled Swedish Obese Subjects Study (bariatric surgery group, *n*=1570; control group [usual care], *n*=1729; follow-up, 10–13 years).
3. Baseline adiponectin and 2-year changes were associated with incident diabetes and myocardial infarction in the control group, but not in the surgery group. Baseline adiponectin did not predict treatment benefit of bariatric surgery.

Herder C, Peltonen M, Svensson PA et al (2014) Adiponectin and Bariatric Surgery: Associations With Diabetes and Cardiovascular Disease in the Swedish Obese Subjects Study. *Diabetes Care* **37**: 1401–9