

Specialist diabetes clinics: A multidisciplinary approach to managing coexistent type 2 diabetes and obesity

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Citation: Rajeswaran C, Pardeshi P, Srinivasan B (2012) Specialist diabetes clinics: A multidisciplinary approach to managing coexistent type 2 diabetes and obesity. *Diabetes in Practice* 1: 34–7

Article points

1. The common presentation of coexistent type 2 diabetes (T2D) and obesity is popularly known as “diabetesity”.
2. Diabetesity presents healthcare professionals with a complex challenge, requiring an integrated and coordinated approach that addresses both conditions in a unified manner.
3. The authors set up a specialist, dedicated, multidisciplinary diabetesity clinic to manage the growing prevalence of diabetesity in their locality.
4. The clinic supports both physiological and psychological issues of diabetesity through diet, lifestyle and pharmacological interventions, with the aim of simultaneously optimising glycaemic control and weight management.

Key words

- Diabetesity
- Multidisciplinary team
- Obesity
- Type 2 diabetes

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The term “diabetesity” describes the strong link between coexistent type 2 diabetes (T2D) and obesity. Obesity is a known risk factor for the development of T2D, and yet, many therapeutic options for managing T2D are associated with weight gain, therefore exacerbating weight-related complications in an already overweight population. This close interrelationship has led to diabetesity now emerging as a speciality in its own right within diabetes care. The aetiology and management of diabetesity is complex, and draws on many aspects of conventional health care. Thus, a multidisciplinary approach that focuses on managing both conditions in a unified manner has an increasing role to play in addressing this growing public health challenge. The authors discuss the intricacies and benefits of providing a specialist multidisciplinary diabetesity clinic and describe the service currently provided at their hospital.

The prevalence of type 2 diabetes (T2D) is rapidly increasing worldwide, and can largely be attributed to the concurrent increase in obesity (Zimmet et al, 2001). Around 80% of people with T2D are obese (Bloomgarden, 2000), and a BMI of 35 kg/m² has been found to increase the risk of developing T2D by 93-fold in women and by 42-fold in men (Jung, 1997). Both conditions are established cardiovascular (CV) risk factors (*Box 1*) associated with increased morbidity and mortality (Haslam and James, 2005; Diabetes UK, 2010).

Obesity and T2D have multiple causes and multiple treatment options. Weight management is critical for limiting the development of glucose intolerance and progression from a state of impaired glucose tolerance to diabetes, as well as for optimal management in those who go on to develop T2D. However, a number of current diabetes therapies promote weight gain in an already overweight population (Mitry and Hamdy, 2009). This complexity means that an integrated and coordinated approach, using a dedicated multidisciplinary team focusing on managing both T2D and obesity in a unified manner, is required.

In this article the authors describe the provision of a specialist multidisciplinary diabetesity clinic at their hospital, aimed at helping people with coexistent T2D and obesity manage both conditions simultaneously.

The specialist diabetesity service in Mid Yorkshire Hospitals NHS Trust

The dedicated specialist diabetesity service was initiated in Mid Yorkshire Hospitals NHS Trust in 2007 to address the growing prevalence of people with diabetesity in the locality. The aim of the service is to manage the complex healthcare needs of people with diabetesity and to address both conditions in a unified way, simultaneously optimising glycaemic control and weight management.

Most clinicians will agree that a multidisciplinary one-stop clinic approach improves patient adherence, thereby simultaneously optimising glycaemic control and weight management. This leads to cost savings in terms of pharmacotherapy usage and healthcare professionals' time.

The service brings together a multidisciplinary team (MDT) to address the combined and complex

needs of people with diabetes, and includes a consultant, diabetes specialist nurse, clinical psychologist, specialist dietitian, physiotherapist, occupational therapist, moving and handling specialist, and a coordinator. With this combined expertise, the service is able to address all aspects of T2D and obesity in a way that optimises the management of both conditions.

Referral to the service

The number of referrals to the diabetes service are increasing every year. It is therefore essential to ensure that robust yet inclusive referral criteria are in place to best serve those in need. At the authors' institution, people are accepted into the diabetes service if they have T2D with an HbA_{1c} level of >64 mmol/mol (>8%) and a BMI >27.5 kg/m².

Following referral, individuals undergo initial assessment by the consultant. These measure a range of biometric and psychological parameters, aimed at evaluating the individual's status with regard to their diabetes and obesity. *Box 2* outlines the full scope of these initial assessments.

Initial investigations required on referral

A number of initial investigations are required to give an understanding of the health status of individuals referred to the service. Initial investigations requested include baseline kidney and liver function tests, full blood count and HbA_{1c} level. Endocrine abnormality is an established cause of weight gain in around 10% of people attending the diabetes clinic, and is assessed by using blood tests looking for thyroid dysfunction. If indicated, tests for hypogonadism and hypercortisolism are organised. Sleep patterns and daytime sleepiness are also assessed using the Epworth Sleepiness Scale (Johns, 1991); if the score is ≥10, patients are referred for sleep study to rule out obstructive sleep apnoea. Patients are also asked to complete food, blood glucose and hunger pattern diaries and to bring them to each appointment. An extended glucose tolerance test is undertaken if reactive hypoglycaemia is suspected.

MDT approach to diabetes

Each member of the MDT provides specialist support. The diabetes specialist nurse plays a vital role within a successful diabetes service and provides specialist expertise in delivering nurse-

Box 1. Common health problems associated with obesity (Bray, 1985).

- Cardiovascular
 - Hypertension
 - Dyslipidaemia
 - Coronary heart disease
 - Cerebrovascular disease
 - Deep vein thrombosis
 - Varicose veins
- Endocrine
 - Type 2 diabetes
 - Insulin resistance
 - Polycystic ovary syndrome
 - Amenorrhoea/infertility
 - Hirsutism
 - Breast cancer
- Respiratory
 - Breathlessness
 - Obstructive sleep apnoea
 - Sleep-related hypoventilation
- Gastrointestinal
 - Gastro-oesophageal reflux disease
 - Gallstones
 - Hiatus hernia
 - Fatty liver and non-alcoholic steatohepatitis
 - Colon cancer
- Musculoskeletal
 - Immobility
 - Osteoarthritis
 - Back pain
- Genitourinary
 - Stress incontinence
 - Endometrial cancer
- Psychological
 - Depression/low self-esteem
 - Binge eating disorder, night eating syndrome

led clinics to ensure: appropriate and supported pharmacotherapy initiation; monitoring and evaluation of treatment plans; management of people with diabetes, before and after bariatric surgery; audit; and protocol, guideline and service development. The diabetes specialist nurse also evaluates the patient's blood glucose, food and hunger pattern diary during each visit. This collaborative approach enables the healthcare professional and patient to set specific and appropriate goals in relation to glycaemic control and weight management (Radimer et al, 1990).

The specialist dietitian has an important role in offering behavioural therapy and advice on very-low-calorie diets to aid weight loss. Education is also provided regarding carbohydrate and its effect on blood glucose levels.

The consultant and the diabetes specialist nurse work closely with the clinical psychologist. Patients

Page points

1. The service brings together a multidisciplinary team of healthcare professionals to address the combined and complex needs of people with diabetes, and includes a consultant, diabetes specialist nurse, clinical psychologist, specialist dietitian, physiotherapist, occupational therapist, moving and handling specialist, and a coordinator.
2. Following referral, individuals undergo initial assessment by the consultant. These measure a range of biometric and psychological parameters, aimed at evaluating the individual's status with regard to their diabetes and obesity.
3. A number of initial investigations are required to give a detailed understanding of the physiological health status of individuals referred to the service. Initial investigations requested include baseline kidney and liver function tests, full blood count and HbA_{1c} level.

Page points

1. Patients are encouraged and trained to identify the differences between cravings and hunger and to use this understanding to modify their food intake.
2. Working alongside the diabetes specialist nurse, the physiotherapist encourages dose alteration for insulin and oral antidiabetes drugs, based on physical activity and blood glucose levels.
3. Multiple therapeutic options are available for treating diabetes, a number of which promote weight gain – such as insulin, sulphonylureas, thiazolidinediones and glinides – thereby exacerbating underlying weight problems and adversely affecting cardiovascular risk.
4. By reducing insulin dose appropriately, in conjunction with an integrated approach using diet and exercise, weight gain with insulin therapy can be minimised.

Box 2. Key components of an initial patient assessment following referral to the diabetes service.

- A full medical and social history, including childhood, menstrual, family, personal, drug and previous weight-loss history.
- Full-body composition analysis, including height, weight, BMI, basal metabolic rate, body fat percentage and muscle mass.
- Assessment of glycaemic excursions – this evaluates the effect of food on blood glucose levels and the extent to which the levels differ pre- and post-meal. The effect of physical activity on glucose levels is also assessed.
- Hunger patterns – this assesses when the patient feels hungry. This pattern can then be used to identify the cause of that hunger, which can then be further classified into physical and psychological/hedonic hunger. During the assessment it is important to try to establish whether there is mismatch between the individual's blood glucose level and hunger pattern.
- Assessment of sleep deprivation. Sleep study is requested in people with significantly high Epworth Sleepiness Scale scores (Johns, 1991). It is widely accepted that a score of >10 indicates a higher risk.
- History of erectile dysfunction is taken and relevant investigations requested. Obesity is associated with low testosterone levels in men, and significant numbers of obese men with type 2 diabetes have a biochemical picture of hypogonadotropic hypogonadism (Kapoor et al, 2004).
- Psychological wellbeing is assessed in relation to weight management. History is elicited to determine if there was a life-changing event that could have contributed to weight gain. These events may have been triggers to use food as a comfort or security (Seng et al, 2004).
- Assessment of the individual's perception of their body weight. Do they see their body weight as problematic? What do they feel the cause of their increased body weight to be?
- Assessment of motivation. What is the person's motivation to manage their weight? What would be better if weight was reduced? If a person is motivated it is more likely that a successful outcome will be achieved both in terms of weight loss and glycaemic control.
- Assessment of mobility is undertaken and the effect of obesity on mobility is evaluated. Can this be improved by weight loss? It is thought that obesity is the cause of such mechanical disorder rather than a metabolic effect (National Heart Forum, 2007).
- A detailed drug history is taken to establish if any medications are contributing to diabetes or obesity (e.g. norethisterone, pizotifen, sodium valproate).

identified as likely to benefit from psychological support after basic cognitive behaviour therapies are referred to the psychology service. Patients are encouraged and trained to identify the differences between cravings and hunger and to use this understanding to modify their food intake.

The physiotherapist provides an exercise programme tailored to each person's ability and comorbidities. Working alongside the diabetes specialist nurse, the physiotherapist encourages dose alteration for insulin and oral antidiabetes drugs, based on physical activity and blood glucose levels.

Clinical management of diabetes

Weight reduction is fundamental for managing obese people with T2D (*Box 3*). Members of the MDT work together in addressing not only weight and glycaemic control but also obesity- and diabetes-related complications (Department of Health, 2001; Kentz and Bailey, 2005). Interventions are holistic and tailored to the specific circumstances of each person; after initial assessment, investigation and treatment of

underlying endocrine abnormalities, focus is then shifted to identifying hunger patterns and assessing any underlying psychological issues.

Pharmacotherapy

Multiple therapeutic options are available for treating diabetes, a number of which promote weight gain – such as insulin, sulphonylureas, thiazolidinediones and glinides (Mitri and Hamdy, 2009) – thereby exacerbating underlying weight problems and adversely affecting CV risk (Russel-Jones and Khan, 2006). Insulin-induced weight gain in particular is caused by conservation of calories previously renally excreted, combined with patients often increasing their calorie intake to defend against hypoglycaemia. However, by reducing insulin dose appropriately, in conjunction with an integrated approach using diet and exercise, weight gain with insulin therapy can be minimised (Russel-Jones and Khan, 2006).

Individualising pharmacological interventions is therefore key, with a view to optimising glycaemic control while simultaneously addressing weight

management issues. To this end, a number of new drug therapies are available for the treatment of T2D that are either considered weight-neutral (dipeptidyl-peptidase-4 [DPP-4] inhibitors) or associated with weight loss (glucagon-like peptide-1 [GLP-1] receptor agonists) (Mitri and Hamdy, 2009; NICE, 2009). Patients should be supported by the healthcare professional in the use of such medicines (Phelan and Wadden, 2002) and advised on side-effects. In addition, it is important to stress to patients that these drugs are merely a tool to be used in conjunction with lifestyle and dietary modification.

Support and self-management

The diabetes specialist nurse and patient work in partnership to promote self-management. Patients are encouraged to identify their hunger patterns and support is then provided to understand and reset these. A useful tool is motivational interviewing, which is a person-centred, semi-directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence (Silverman, 1998; Miller and Rollnick, 2002).

Self-management is a vital concept within the diabetes clinic. Patients are encouraged to attend the Expert Patients Programme and DESMOND (Diabetes Education and Self Management for Ongoing and Newly Diagnosed) programme, which are available locally. These offer patients information and the skills to effectively manage their condition (Diabetes UK and DH, 2005).

Coping strategies during stress and techniques for distraction should also be discussed to deal with cravings, which commonly last for about 30 minutes in duration (Kohsaka and Bass, 2007). This method can help in reducing portion size and comfort eating.

Conclusion

The complex aetiological interrelationship between obesity and T2D makes a strong case for a unified clinic under the management of a multidisciplinary healthcare professional team. Such an approach places the person with coexistent T2D and obesity at the centre of their care, treating both conditions simultaneously, rather than two conditions in isolation. In order to deliver such a service, there needs to be a collaborative effort across traditional organisational divides. ■

Box 3. Benefits associated with a 10% body weight reduction (Jung, 1997).

- Mortality – Decrease (>20%) in total mortality
– Decrease (>30%) in diabetes-related deaths
– Decrease (>40%) in obesity-related cancers
- Blood pressure – Reduction of 10 mmHg (systolic)
– Reduction of 20 mmHg (diastolic)
- Diabetes – Reduction (30–50%) in fasting glucose level
– Reduction (50%) in risk of developing diabetes
– Decrease (15%) in HbA_{1c} level
- Lipids – Decrease (10%) in total cholesterol
– Decrease (15%) in LDL-cholesterol
– Decrease (30%) in triglycerides
– Increase (8%) in HDL-cholesterol

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- Bloomgarden ZT (2000) American Diabetes Association Annual Meeting, 1999: diabetes and obesity. *Diabetes Care* **23**: 118–24
- Bray GA (1985) Complications of obesity. *Ann Intern Med* **103** (6 Pt 2): 1052–62
- Department of Health (2001) *National Service Framework for Diabetes: Standards*. DH, London
- Diabetes UK (2010) *Diabetes in the UK 2010: Key Statistics on Diabetes*. Diabetes UK, London
- Diabetes UK, Department of Health (2005) *Structured Patient Education in Diabetes: Report from the Patient Education Working Group*. Diabetes UK and DH, London
- Haslam DW, James WP (2005) Obesity. *Lancet* **366**: 1197–209
- Johns MW (1991) A new method for measuring daytime sleepiness: the Epworth sleepiness scale. *Sleep* **14**: 540–5
- Jung R (1997) Obesity as a disease. *Br Med Bull* **53**: 307–21
- Kapoor D, Goodwin E, Channer KS, Jones T (2004) Testosterone replacement therapy improves insulin resistance, glycaemic control, visceral adiposity and hypercholesterolaemia in hypogonadal men with type 2 diabetes. *Eur J Endocrinol* **154**: 899–906
- Kentz A, Bailey C (2005) *Type 2 Diabetes in Practice*. 2nd edn. Royal Society of Medicine Press, London
- Kohsaka A, Bass J (2007) A sense of time: how molecular clocks organize metabolism. *Trends Endocrinol Metab* **18**: 4–11
- Miller WR, Rollnick S (2002) *Motivational Interviewing: Preparing People to Change*. 2nd edn. Guilford Press, NY, USA
- Mitri J, Hamdy O (2009) Diabetes medications and body weight. *Expert Opin Drug Saf* **8**: 573–84
- National Heart Forum (2007) *Lightening the Load: Tackling Overweight and Obesity*. NHF, London
- NICE (2009) *Type 2 Diabetes: Newer Agents*. NICE, London
- Phelan S, Wadden TA (2002) Combining behavioral and pharmacological treatments for obesity. *Obes Res* **10**: 560–74
- Radimer KL, Olson CM, Campbell CC (1990) Development of indicators to assess hunger. *J Nutr* **120**: 1544
- Russell-Jones D, Khan R (2006) Insulin-associated weight gain in diabetes – causes, effects and coping strategies. *Diabetes Obes Metab* **9**: 799–812
- Seng JS, Low LK, Sparbel KJ, Killion C (2004) Abuse-related post-traumatic stress during the childbearing year. *J Adv Nurs* **46**: 604–13
- Silverman J (1998) *Skills for Communicating With Patients*. Radcliffe Medical Press, Oxon
- Zimmet P, Alberti KG, Shaw J et al (2001) Global and societal implications of the diabetes epidemic. *Nature* **414**: 782–7