

Diabetes

A 21st century epidemic

A report from the 2nd National Conference of the National Diabetes Forum, held on 17 June 2010 at the Hilton Birmingham Metropole, Birmingham. The gold sponsor of the event was Novo Nordisk. This meeting report was generated independently by the publisher and conference speakers, with whom editorial control rests.

“The joint effect of diabetes and obesity is an epidemic likely to be one of the most important challenges for the global public health community in the 21st century”, said conference Chair Anthony Barnett, Professor of Medicine and Honorary Consultant Physician, Heart of England NHS Foundation Trust. He explained how this event aimed to act as an interactive forum to explore the outcomes of recent trials, emerging treatments and global implications of obesity and type 2 diabetes (T2D), and threw the term “diabetes” open to debate.

Diabetes – is this the 21st century epidemic? *David Haslam (GP and Chair, National Obesity Forum, Hertfordshire)*

“With nearly two-thirds of men and half of women worldwide overweight, obesity is no laughing matter”, said Professor Haslam. He began by introducing the National Obesity Forum and defining the term “diabetes” as a “popular term for the common clinical association of T2D and obesity”.

Sims et al (1973) showed that men with no family history of diabetes who were forced to gain weight experienced impaired glucose tolerance and reversible rises in fasting concentrations of insulin, glucose and triglycerides, commented Professor Haslam, who went on to explain that the term “diabetes” – originally coined by Sims et al – refers to non-obese, non-diabetic individuals.

Professor Haslam went on to discuss the relationship between T2D and BMI and stressed the importance of prevention and early screening, rather than cure, of T2D. He explained how the integrated management of obesity and T2D, including lifestyle intervention and clinical therapy, will ultimately be more effective than separate treatment strategies.

This conference aimed to promote a unified approach in the management of obesity, type 2 diabetes and associated complications among healthcare professionals managing people with these conditions. This meeting report summarises the existing knowledge of the integrated management of diabetes, presented at the the National Diabetes Forum’s second annual conference.

Is there an interplay between hormones, sleep and diabetes?

Shabrad Taheri (Senior Lecturer in Diabetes and Endocrinology, Heart of England NHS Foundation Trust, Birmingham)

Dr Taheri presented the results of several international population studies across various age groups that demonstrated insulin resistance and abnormalities in metabolic hormones in sleep-deprived people.

“The connection between short sleep duration and obesity, metabolic syndrome and diabetes has been seen in very large population studies across all age groups, even in children as young as 5 years old”, he said.

In a study by von Kries et al (2002), 5.4% of 5- and 6-year-old children who slept ≤ 10 hours per night were found to be obese compared with just 2.1% of children who slept for ≥ 11 hours.

Dr Taheri went on to discuss the effect of two opposing metabolic hormones, leptin and ghrelin, in the regulation of appetite. He presented the results of the Wisconsin Sleep Cohort study in which sleep habit and appetite- and energy expenditure-related hormone data were obtained from 1000 adults (Taheri et al, 2004). “Results confirmed that short sleep duration is associated with increased body weight”, he said. “Lack of sleep affects leptin and ghrelin; with sleep loss, low leptin and high ghrelin can give powerful dual signals that the body has an energy deficit, thus increasing food intake.”

Dr Taheri concluded that manipulating sleep as an adjunct to lifestyle intervention and clinical therapy may be a novel approach to addressing the current obesity pandemic.

Diabetes in primary care – the way forward *Matthew Capehorn (Clinical Director, National Obesity Forum, and Clinical Manager, Rotherham Institute for Obesity)*

Dr Capehorn opened by discussing health problems associated with obesity, and reported that “by 2050, total direct and indirect costs of obesity may increase to £49.9 billion” (Government Office for Science, 2007).

Dr Capehorn went on to discuss the BMI classifications of obesity, the android and gynoid patterns of body fat distribution, the link between excess visceral fat and T2D and the correct technique to measure waist circumference. He stressed the different calculation criteria in children and adults and the importance of correct weighing and measuring of children.

Dr Capehorn presented the NHS Rotherham Model of Healthy Weight Commissioning Framework, a comprehensive care pathway from prevention to intensive treatment. Tier 1 identifies overweight individuals through primary activity, who are then enrolled onto 10-week weight-management services (Tier 2). If goals are not met, individuals are referred to a multidisciplinary specialist obesity service (Tier 3); if no improvements are seen, specialist obesity services for adults and residential camps for children (Tier 4) are provided.

Dr Capehorn then introduced the Rotherham Institute for Obesity (RIO), a Tier 3 specialist obesity service that focuses on one-to-one and group educational sessions, dietetic advice, talking therapies, physical activity, pharmacotherapy and individual assessment of eligibility for higher tiers of intervention.

Dietetic advice in diabetes – different from that in obesity?

Mary O’Kane (Clinical Specialist Dietician, Leeds General Infirmary)

“The main treatment for diabetes is weight loss,” said Mary, “which improves insulin sensitivity, glycaemic control and lipid profiles. But people who are obese and have diabetes often lack the motivation to lose weight as they find it harder to shed the pounds in the first place and subsequently keep the weight off”.

The first goal in a weight-loss programme for obese people with T2D is keeping body weight steady. Once this has been achieved, minor weight loss followed by weight maintenance should be aimed for, she explained.

Mary went on to discuss the results of various studies on a range of dietary and lifestyle interventions including calorie-controlled diets, formula diets, low glycaemic index diets, very low-calorie diets, behavioural therapy and increased physical activity.

“Very-low and low-calorie diets combined with behavioural therapy have been found to be the most effective weight loss strategies in obese people with T2D,” she said, “but it is difficult to maintain these lifestyle changes long term”. She explained that the skills required to maintain weight loss are very different to those used to achieve initial weight loss, and ongoing support is required to achieve long-term maintenance.

Setting up a diabetes clinic – how is it different from a diabetes clinic?

Chinnadorai Rajeswaran (Consultant Endocrinologist, Mid-Yorkshire NHS Trust)

“Weight gain is almost unavoidable in people with T2D on insulin, and can contribute to patient frustration, negatively impact their compliance and increase cardiovascular risk and insulin resistance”, said Dr Rajeswaran. “While trying to optimise glycaemic control, increase in body weight should be avoided”, he added.

Dr Rajeswaran explained that people with T2D should remain on metformin while switching to insulin therapy to reduce weight gain and recommended a long-acting (basal) insulin if fasting plasma glucose is elevated and a rapid-acting (prandial or bolus) insulin if post-prandial plasma glucose (PPG) is elevated.

“As patients get closer to HbA_{1c} target levels, PPG becomes the most significant contributing factor and appropriate changes to insulin regimen and dose should be made”, he said.

Dr Rajeswaran suggested the use of glucagon-like peptide-1 (GLP-1) receptor agonists following failure of a combination of oral antidiabetes agents to achieve glycaemic control. “Basal–bolus regimens should not be considered a gold standard for optimal glycaemic control in people with T2D”, he said.

Dr Rajeswaran concluded by stressing the importance of a holistic management approach in a diabetes clinic in terms of glycaemic control, body weight and hunger patterns, psychological issues and underlying endocrine abnormalities.

Therapy by non-psychologists in diabetes – is it effective?

Richard Aubrey (Clinical Psychologist, Mid-Yorkshire NHS Trust)

Dr Aubrey opened by inviting delegates to explore and assess their consultations and approach to treatment for people with diabetes.

“Patients enter a consultation in one of three states: engaged, defensive or anxious”, he said. “An effective consultation is tailored to suit the state of the patient to properly engage and generate effective clinical intervention.”

Dr Aubrey stressed the importance of correctly identifying the state of the individual on entering the consultation prior to intervention and, by role-play of case examples, demonstrated the different treatment approaches to induce engagement in the three patient states.

“It is crucial that the individual is engaged if there is to be any chance of effective clinical intervention”, he said. “The person must hold the desire to change; the desire should not be held by the healthcare practitioner alone”.

Motion for debate: “Type 2 diabetes is an operable gastrointestinal disease”

Professor Jonathan Pinkney (Consultant Physician, Peninsula College of Medicine and Dentistry, and Honorary Consultant, Plymouth Hospitals NHS Trust) and Roger Ackroyd (Consultant Surgeon, Royal Hallamshire Hospital, Sheffield)

Professor Pinkney opened the debate by defining diabetes as “a condition that results from interactions between the environment and some 30 susceptibility genes”.

“Diabetes is neither operable nor a gastrointestinal disease”, he said. “In all probability, T2D is not ‘curable’ through surgery. While bariatric surgery has a beneficial effect on blood glucose levels in

the short term, it has far less impact on other important CV risk mechanisms, and its long-term impact has been poorly evaluated compared with the drugs used to treat T2D. Most people with T2D will always be managed with medical therapies.”

Dr Ackroyd argued that in recent years, various forms of obesity surgery, such as Roux-en-Y gastric bypass, biliopancreatic diversion and duodenal switch, have resulted in excellent resolution of T2D, with up to 96% improvement with gastric bypass and up to 100% improvement with more radical surgery.

“The mechanism of action is largely unknown”, he said, “but it is possibly related to exclusion of the duodenum from the foodstream and associated hormonal effects. Even in non-obese subjects, the first-line treatment for T2D will be surgical within the next 5–10 years, and if it isn’t, it should be!”

Designer drugs for diabetes

Clifford Bailey (Professor of Clinical Science, School of Life and Health Sciences, Aston University, Birmingham)

“The frequent co-existence of T2D and obesity, and their close pathogenic interrelationship, favours the development of therapeutic options that control HbA_{1c}, support beta-cell function and counter insulin resistance while not inducing weight gain, or even promoting weight loss”, said Professor Bailey.

He went on to discuss various currently available antidiabetes treatments that are associated with weight loss, including GLP-1 receptor agonists, pramlintide and sodium-glucose co-transporter 2 inhibitors. He introduced a class of peroxisome proliferator-activated receptor modulators, which do not cause weight gain, currently under investigation, and enhancers of silent information regulator-2 proteins, which have demonstrated blood glucose- and weight-lowering effects in a range of preclinical models (Milne et al, 2007).

Professor Bailey concluded that “a combinatorial epidemic requires combination therapy. Although there is no magic ‘designer’ bullet, several blood glucose-lowering drugs can simultaneously assist weight loss, and some weight-loss drugs may assist blood glucose control”. ■

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