

Rising obesity means more diabetes

The science of diabetes and the care of patients with the disease were discussed at a recent meeting. Irene Gummerson reports

Obesity contributes to rising diabetes rates and is more marked in developing countries, stated Naveed Sattar, professor of metabolic medicine, Glasgow. Some groups, for example, South Asians, are highly sensitive to weight gain. At present, women in the UK are the most obese in Europe (and this is deprivation-linked) and men in the UK the second most obese (after Malta). Type 2 diabetes is also appearing in obese children and young people.

Subcutaneous fat is metabolically healthy. However a large waist is linked to an increase in insulin resistance with increasing levels of visceral and muscle fat. A decrease in fat in the diet and an increase in physical activity can help. Limiting energy dense food, saturated fats, refined sugar, and increasing fruit, vegetables and fibre are recommended.

"What is provided is what is eaten, so what is provided must change," Professor Sattar said, showing pictures of fast food outlets, chocolates and burgers. "Most people do not want to be overweight. One third to a half who are obese will not lose weight by any medical method. So prevention is a priority. The government must facilitate healthier choices," he concluded.

The role of lifestyle, drugs and surgery in managing obesity was outlined by John Wilding, senior lecturer in medicine at the University of Liverpool.



Men in the UK are the second most obese in Europe, after Malta

"You don't necessarily have to normalise weight to have a benefit," he said. For example, a 90kg person with a body mass index of 31 has an excess weight of 21kg. If that person were to lose 5 per cent of his weight (equivalent to 21 per cent of the excess weight) he would have lost about 40 per cent

of excess abdominal fat, as well as improving blood pressure and lipids levels.

A modest weight loss is the best goal in most patients, said Professor Wilding. The hard part is the year-on-year maintenance. More than 10 per cent of patients in respected studies achieved a 5 per cent loss, and few achieved a 10 per cent loss. Very low calorie diets result in significant losses but after five years patients seem to regain the weight (and more). He said that conventional diets lead to better results at the five-year point.

Some drugs (eg, beta-blockers and depot contraceptives) can make losing weight more difficult. Touching on obesity pharmacotherapy, Professor Wilding said that orlistat was effective and that side effects were not a major problem with sibutramine. Metformin was used first line (if tolerated) in the overweight or obese to treat their diabetes. When he prescribed rimonabant, about half his patients could achieve a 5 per cent weight loss. The recently launched exenatide could help attain a weight reduction of 5kg, but the dipeptidyl peptidase IV inhibitors (not yet launched in UK) were weight neutral.

There have been successes using surgery (adjustable band or gastric bypass) in those with morbid obesity (BMI > 40). Laparoscopic surgery helped to reduce morbidity and mortality. He said it was possible to normalise glycaemia with bariatric surgery.

Managing gastroparesis in people with diabetes

Stephen Thomas, consultant in diabetes and endocrinology at Guy's and St Thomas' Hospital, London, defined gastroparesis as "a symptomatic, chronic disorder of the stomach characterised by delayed gastric emptying in the absence of mechanical obstruction". Symptoms include dyspepsia, epigastric pain (in 90 per cent of cases), nausea (93 per cent), vomiting (68 per cent), early satiety (86 per cent), post-prandial fullness, anorexia, erratic glycaemic control, recurrent diabetic keto-acidosis and hypoglycaemia. There is delayed gastric emptying in 30 to 55 per cent of patients with type 1 diabetes and in 30 per cent of patients with type 2. Solids are delayed twice as long as liquids.

Normal gastric emptying reflects a co-ordinated effort between different regions of the stomach and the duodenum as well as extrinsic modulation by central nervous system and distal gut factors.

Migrating motor complexes act as "house-keeper" to all this activity. These are waves that sweep through the intestines in a regular cycle during fasting state ("rumbling stom-

ach"). Migrating motor complexes originate in the stomach every 75 to 90 minutes between meals. They transport bacteria from the small to the large intestine and are regulated by motilin released in the stomach as a response to vagal stimulation.

Abnormalities encountered in diabetes include:

- Altered gastric electrical activity
- Decreased tone, motility, contraction in different parts of the stomach, duodenum and small intestine
- Altered visceral awareness
- High levels of glucagon
- Altered incretins or ghrelin

Predictors of delayed gastric emptying (both solids and liquids) in diabetes are ab-

dominal bloating or fullness and female sex (80 per cent of cases).

Medicines that delay gastric emptying include narcotics, tricyclic antidepressants, calcium channel blockers and proton pump inhibitors. Metoclopramide (prokinetic, antiemetic) accelerates gastric emptying in the short term but should not be used for more than one month. Domperidone (prokinetic, antiemetic) does not cross the blood-brain barrier. It may act by improving gastric electrical dysrhythmias rather than promoting more rapid gastric emptying. It increases both solid and liquid emptying.

Erythromycin, a motilin receptor agonist and a powerful prokinetic agent, intravenously or orally stimulates fasting and post-prandial stomach contractile activity, said Mr Thomas.

The intravenous administration of 250mg of erythromycin normalised the prolonged gastric emptying times for both solids and liquids.

Cisapride can decrease symptoms of gastroparesis for a year. It lost its product licence

some years ago due to fatal cardiac arrhythmias, but some specialists still use it, he explained.

Anti-emetics could also help, said Mr Thomas. Prochlorperazine's side effects include sedation and extrapyramidal effects. Cyclizine and hyoscine slow gastric emptying. Ginger reduces hyperglycaemia-induced gastric dysrhythmia and nausea.

The effect of diet on gastroparesis was explained by Maria Leveridge, senior dietitian at Peterborough Primary Care Trust. She told the meeting that when people with gastroparesis adopted a low fat, low fibre, low alcohol diet, this generally helped the condition, as did not smoking and not drinking carbonated beverages.

Fat stimulates the release of cholecystokinin, she said, which delays gastric emptying, sometimes doubling the amount of time food stays in the stomach. Patients on low fat diets show improvements over time and maintain it. However, being associated with weight loss, it does not suit patients with a low BMI. It may be useful to spread fat ingestion evenly through the day (four to five times).

Viscous (soluble) fibre has been associated with prolonged gastric emptying; whereas fermentable (insoluble) fibre improves bowel health by promoting bowel movement, reducing transit time and increasing stool weight. Ms Leveridge said that she had found that a low fibre diet may or may not help

people with gastroparesis. Some patients find that high fibre gives them colicky pains. Some translate "low fibre" to "no fibre", and restrict all fibre.

Practical advice includes:

- Limiting portion size of foods high in soluble fibre, eg, oats, fruit and vegetables, and pasta, to improve gastric emptying
- Eating small, frequent meals
- Resting after a meal
- Staying upright, perhaps taking a walk after a meal

Ms Leveridge concluded that gastroparesis is a complicated condition that needs a multidisciplinary approach.

How to help diabetic muslims cope with Ramadan fasting

The Koran exempts people with diabetes mellitus from fasting at Ramadan, because fasting can increase the risk of complications, said Mohammed Hassanein, consultant in diabetes and endocrinology, Glan Clwyd Hospital. However, many people fast in spite of medical risks. He recommends:

- First discussing risks with health care professionals
- Undergoing pre-Ramadan assessment and receiving structured education in relation to physical activity, meal planning, glucose monitoring, dose and timing of medication
- Adjusting injectable and oral diabetes therapy up to two months before Ramadan
- Avoiding excessive reduction in insulin dosage to prevent hypoglycaemia (may increase risk of hyperglycaemia and diabetic ketoacidosis)
- Avoiding ingestion of large amounts of foods rich in carbohydrate and fat
- Increasing fluid intake during non-fasting hours, and taking the pre-dawn meal as late as possible before the start of the day fast
- Maintaining normal levels of physical activity, avoiding excessive amounts

Mr Hussanein suggested avoiding fasting on "sick days" and emphasised that all patients must always and immediately end their fast if:

- They suffer hypoglycaemia (blood glucose lower than 3.5mmol/L)
- Their blood glucose goes below 3.9mmol/L in the first few hours after the start of the fast, especially if insulin, a sulfonylurea or a meglitinide has been taken before dawn
- Their blood glucose reaches 16.7 mmol/L or above

Implications of recent clinical trials

David Matthews, chairman of the Oxford Centre for Diabetes, Endocrinology and Metabolism, discussed the DREAM (diabetes reduction assessment with ramipril and rosiglitazone medication) trial.

He said that it asked a fundamental question: would ramipril and rosiglitazone prevent the onset of diabetes in those at risk with impaired fasting glucose (IFG) or impaired glucose tolerance (IGT)?

This was a reasonable question, he said, since the HOPE study had shown a possible reduction, and thiazolidinediones (troglitazone) had shown a good effect in the DPP/Tripod study, although troglitazone has been withdrawn.

"Ramipril had no demonstrable effect on the transition from IFG/IGT to diabetes, although it reduced BP," stated Professor Matthews. But for rosiglitazone, the conclusion of the trial was that a dose of 8mg daily reduces new diabetes by more than 60 per cent in people with IFG or IGT, but, Professor Matthews argued, "only because we define diabetes by prevailing glucose and not by a pathological process. So, would anything that reduces glucose get rid of diabetes? It

does not reverse the underlying process," he emphasised. It caused a 3 per cent weight gain and 0.5 per cent rate of heart failure in a group that had no significant risk of heart failure.

"Would we change clinical practice on the basis of these results," Professor Matthews asked. "Lowering glucose is probably beneficial but the cost of intervention was high, at about £600 per patient per year, while effectiveness was debatable. The side effects were not trivial, and other approaches (for example, lifestyle and metformin) were safe."

He proposed an alternative view: "For every £600,000 spent each year on 1,000 people with rosiglitazone for about three years (total £1.8m), 144 cases of diabetes would be "prevented", with an excess of about four cases of congestive cardiac failure. But the effect is only while taking rosiglitazone, so the commitment is open-ended; 856 people will be taking the tablets for no gain (except in weight loss) over this period."

He concluded that the cost of using rosiglitazone was too high, both financially and in terms of heart failure.

Ways of communication in a digital age

Alistair Emslie-Smith, chairman of the Scottish Care Information Diabetes Collaboration (SCI-DC) Steering Group said that the purpose of SCI-DC is to deliver the IT milestones of the Scottish Diabetes Framework. The principal concept is the creation of a single, shared electronic record which can be assessed by all providing care to the patient. SCI-DC is live or in pilot at all Scottish health boards. About 180,000 patients are currently on the system, which is on standby to link to community pharmacies.

With the patient's details on the screen, clicking on a clinical area leads to the appropriate page in a "clinical handbook". A foot care assessment tool, suggests when a patient

should be referred to a podiatrist, etc. The clinician can ask the system questions. SCI-DC can provide anonymised data and a register of people who have given their consent to be involved in trials. Smart card technology is being trialed and 3D-images are being developed using graphics and radiography at Dundee University. New developments, such as using mobile telephones to send specific messages to patients, are being considered.

An A4 patient-held summary record can be printed off that contains a patient's biomedical details, eg, HbA_{1c} and cholesterol status. It includes agreed goals and timescales, as well as graphs showing the patient's progress in reaching these goals.