Highlights from the Diabetes UK Professional Conference 2017

The Diabetes UK Professional Conference, held in Manchester in March, included an address from the chief executive Chris Askew followed by opening presentations from high-profile speakers on promoting physical activity in diabetes.

Felix David here reports on some of the conference’s highlights.

Promoting physical activity in type 1 diabetes

In people with type 1 diabetes (T1D) only a small minority – 37% according to the DPV database study1 – are defined as physically active. The common fear of hypoglycaemia as a result of exercise in T1D should not, however, deter clinicians from prescribing physical activity as a productive way to manage the condition.

In his presentation, Dr Ian Gallen of Reading University said that the DPV study1 showed that even ‘modest levels of physical activity are associated with reduced cardiovascular disease, obesity, renal disease and retinal disease’, and that physical activity ‘does not have independent protective (or harmful) effect on retinopathy’.

The results from the DPV database study1 showed that HbA1c levels decreased from 66.13mmol/mol to 62.15mmol/mol (p<0.0001) when compared between participants who were physically inactive and those who were physically active, while retinopathy dropped from 12.2% to 6.5% (p<0.0001) and microalbuminuria levels fell from 22.0% to 14.3% (p<0.0001). The results also showed a marked reduction in obesity between those who were physically active and those who were not (16% to 8%, respectively; p<0.0001).

The risk of hypoglycaemia, however, remains problematic. In the DPV study,1 severe hypoglycaemic events rose moderately from 22.18 events/100 PY to 22.60 events/100 PY between participants who were physically inactive and those who were physically active. The results showed that even ‘modest levels of physical activity are associated with reduced cardiovascular disease, obesity, renal disease and retinal disease’, and that physical activity ‘does not have independent protective (or harmful) effect on retinopathy’.

The risk of hypoglycaemia, however, remains problematic. In the DPV study,1 severe hypoglycaemic events rose moderately from 22.18 events/100 patient years (PY) to 22.60 events/100 PY between participants who were physically inactive and those who were physically active. This trend was more significant among 45–80 year olds when the difference was 26 events/100 PY vs 33 events/100 PY, respectively.

Other problems associated with T1D and physical exercise include: falling glucose rates during exercise, the risk of nocturnal hypoglycaemia, and excessive fatigue.

In light of the risks, Dr Gallen urged that we ‘need to move away from the idea of physical activity as predominantly gym work to something more moderate like walking, as any form of activity shows benefits’. Physical activity should therefore be prescribed like any form of treatment, with ‘possible side effects that should be monitored’.

Appropriate exercise targets need to be established between clinicians and patients, including advice on the type and timing of carbohydrate replacement, and advice on the changes in basal insulin dose after physical activity.

Further to this, numerous factors need to be considered – such as if the patient is on medication, drinks alcohol, is pregnant or menstruating, and if they have a thorough understanding of insulin pharmacokinetics – as each can affect insulin sensitivity and glycaemic patterns. Careful self-monitoring, however, can mitigate against the negative side effects that deter so many T1D patients from exercising.

Dr Gallen concluded his talk by reminding the audience that ‘modest increases in physical activity have big benefits’ that should be promoted, as treatment options had now progressed past the old approach of prescribing ‘a mini Mars Bar’ for balancing physical activity with T1D.

Emerging technologies for diabetes

In an overview of the emerging technologies for people with diabetes, Dr Nick Oliver from Imperial College London gave an update on the exciting advancements in flash glucose monitoring systems, closed-loop insulin systems, and fast-acting insulins that will help people with diabetes to manage their condition and maintain a healthy lifestyle.

Beginning with continuous glucose monitoring systems (CGMs), these new devices are gradually replacing the finger-prick method of monitoring that remains the norm today. Currently, NICE guideline NG17, published in August 2016, recommends that only adult patients with frequent hypoglycaemia, or with extreme fear of hypoglycaemia, should be considered for a CGM. However, Dr Oliver was clear that ‘the NHS is catching up with recommendations’ and that the next generation of CGM sensors will be ‘smaller, have improved accuracy, longer duration (10–14 days), and a reduced interference from paracetamol, ascorbic acid and uric acid’.

This year, the Eversense System has been licensed as the first fully implantable CGM, which is placed under the skin in a similar way to a contraceptive and emits continuous glucose data to a smartphone. However, more data are required on its clinical and cost effectiveness before it becomes available on the NHS.

Flash glucose monitoring systems, such as the Freestyle Libre, are currently available and automatically store glucose readings up to every minute, day and night. However, a study by Bolinder et al2 showed it did not result in a lower HbA1c, but it did decrease levels of hypoglycaemia.

Closed-loop insulin delivery has also seen advancements. A 2015 study by Thabit and colleagues3 showed that the Medtronic 670G System reduced HbA1c and exposure to hypoglycaemia in adult participants. The device automatically adjusts insulin delivery every 5 minutes based on glucose levels to keep within the pre-selected target range. Currently, the Medtronic 670G is available only in the United States, but Dr Oliver was clear that, though questions remain, ‘we are no doubt seeing progress’.

Another breakthrough has been the development of fast-acting insulins, notably Novo Nordisk’s Fiasp (faster-acting insulin aspart). Fiasp is a fast ‘on’ and fast ‘off’ insulin,
absorbed into the bloodstream 5–10 minutes after injection and reaching peak concentration in 25 minutes before rapidly disappearing. This rapid reaction can help reduce hypoglycaemic incidents and would ‘vastly improve things for people with type 1 diabetes who want to be able to grab a sandwich or enjoy an unexpected treat since they can take it at the same time as eating,’ said Dr Oliver.

Home engineered solutions – innovations in technology created by people with diabetes under the hashtag #wearenotwaiting – are also expanding the diabetes product market. Among other initiatives, the group is currently aiming to make artificial pancreas system technology widely available to people with T1D and is encouraging open access to more diabetes data.

In support of this initiative, Dr Oliver praised the movement as ‘driving innovation and it would be good to see them working with commerce more closely’.

Injectables: is there anything really new?

In a major summary on injectables in diabetes care, Dr David Levy of the London Diabetes Centre outlined that there had not been as much progress ‘as we had hoped’, and that a fall in HbA1c levels and instances of hypoglycaemia since 1993 are primarily due to care and system improvements and not to advances in insulin analogues.

The results of recent studies of long-acting analogues in types 1 and 2 diabetes showed that when insulin glargine was compared with neutral protamine Hagedorn (NPH) insulin and degludec there was no difference in HbA1c levels or hypoglycaemia. The only noticeable change was a slightly lower fasting rate (8.0mmol/L compared with the ambitious target of 3.9 to <5.0mmol/L) with degludec in TID patients. In fast-acting analogues, the results were similarly uninspiring. Insulin lispro did not produce any meaningful reduction in HbA1c levels and actually gave worse diurnal blood glucose when compared to human soluble insulin.

Dr Levy stressed that analogues ‘do not improve HbA1c or reduce overall hypoglycaemia’ in comparison to human solubles and, controversially, that the ‘definitions of hypoglycaemia in clinical trials urgently need harmonisation’ in order to avoid a performance bias that obscures objective analysis on the efficacy of some injectables.

However, the results were more promising in longitudinal studies of GLP-1 agonists. Exenatide produced higher weight loss and good glycaemic control when compared against weekly doses of basal glargine over three years, while 1.0mg of semaglutide resulted in a -4.9kg weight loss and a -1.4% mean HbA1c when compared against placebo. Liraglutide, however, produced little meaningful reduction in HbA1c or weight when compared with placebo over four years.

In concluding his presentation, Dr Levy was clear that we need to ‘champion technology that really works’, such as CGMs and insulin pumps. GLP-1 agonists ‘show reasonable or good durability of glycaemia and weight reduction’, but it is long-acting analogues, in particular, that ‘are not equipotent’ and should not be changed to ‘without good clinical reason’.

Should retinal screening begin at 12 years of age?

Visual impairment resulting from diabetic retinopathy is one of the most feared complications associated with diabetes. At the conference, Dr Rebecca Thomas presented new data from Diabetic Eye Screening Wales (DESW) demonstrating that the risk of diabetic retinopathy rapidly increases in children with diabetes after puberty (categorised as being above 13 years of age).

The early detection of background diabetic retinopathy ‘affords an opportunity to improve glycaemic control and the other putative risk factors, including blood pressure, to prevent progression to sight-threatening diabetic retinopathy,’ said Dr Thomas.

In the UK, screening for diabetic retinopathy is currently offered to all children with diabetes from the age of 12, which is then continued on an annual basis as recommended by the Royal College of Ophthalmologists. However, there remains some ambiguity as to the most appropriate age to begin diabetic retinopathy screening, with conflicting recommendations between different programmes/countries. For example, in Scandinavia and Finland, diabetic retinopathy screening begins when patients enter puberty, while the American Diabetes Association recommends screening once the child is 10 years old, or at three to five years after a diabetes diagnosis.

The DESW study involved 3391 children and adolescents with T1D, with results showing that background diabetic retinopathy was evident in ~10% of children aged <13 years, but that this figure rapidly increased to 71.2% between 13–18 years of age. Moderate diabetic retinopathy also saw a marked increase from childhood to adolescence, increasing from 2.3% in those aged 13–14 to 17.0% in those between 19–20 years of age.

The duration of diabetes was also a key factor. The study found no real difference in the rate of background diabetic retinopathy or referable diabetic retinopathy according to age at the onset of diabetes. However, the prevalence of moderate diabetic retinopathy began to increase after three to six years’ duration of diabetes, while the prevalence of referable diabetic retinopathy increased seven to 10 years after diabetes onset. Referable diabetic retinopathy was, however, rare in participants aged below 15 years.

In concluding her presentation, Dr Thomas said the results showed that the current UK guidelines ‘seem appropriate’, but that screening after 12 years of age – as suggested in other studies – was ‘too late’ to be effective at stalling the progression of diabetic retinopathy.

Felix David, Assistant Editor, *Practical Diabetes*

References