

New NICE guidance: Changes in practice for multidisciplinary teams. Part 2: Type 2 diabetes in children and young people

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Article points

1. The recently published National Paediatric Diabetes Audit reported that there are currently 543 young people with type 2 diabetes in England and Wales.
2. The NICE guidance that was published in August last year outlines some specific guidance for children and young people with type 2 diabetes, including dietary advice, monitoring of weight and medication.
3. There is also specific advice on how to avoid complications, particularly cardiovascular complications, such as hypertension and dyslipidaemia.

Key words

- Children and young people
- NICE guidelines
- Type 2 diabetes

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As a consequence of the obesity epidemic that we are facing in the UK and across the world, type 2 diabetes is increasingly becoming more common in children and young people of all ethnicities. While the majority of paediatric diabetes cases will be type 1 diabetes, paediatric multidisciplinary teams are seeing more type 2 diabetes in young people. As a result, the NICE guidance published in August last year includes specific guidance on this topic. This article highlights some of the key recommendations outlined in the guidance, including advice on monitoring of weight, medication and avoidance of complications.

This is the second article on the recently published NICE NG18 guideline, *Diabetes (Type 1 and Type 2) in Children and Young People: Diagnosis and Management*. In this article the management of type 2 diabetes will be explored, as this is the first NICE guideline for type 2 diabetes in this age group. The subtle differences to the type 1 guidelines will be highlighted, paying attention to the key management points.

Over 95% of the 27 682 children and young people in the National Paediatric Diabetes Audit (NPDA) 2014/2015 have type 1 diabetes, but there were just over 543 young people recorded to have type 2 diabetes (Royal College of Paediatrics and Child Health, 2016). Depending on the local demographics, many clinics will have only a few children and young people with type 2 diabetes. However, as the number of cases of childhood obesity increase, it may be that we see a rise in the cases of type 2 diabetes in this age group.

Diagnosis

The guideline recommends that when diagnosing diabetes in a child or young person, assume type 1 diabetes unless there are strong indications of type 2 diabetes.

The possibility of type 2 diabetes in children and young people should be considered in the following situations (NICE, 2015a):

- A strong family history of type 2 diabetes.
- Obesity at presentation.
- Black or Asian family origin.
- No insulin requirement, or have an insulin requirement of less than 0.5 units/kg body weight/day after the partial remission phase.
- Evidence of insulin resistance (for example, acanthosis nigricans).

It is often our colleagues in community growth and nutrition clinics who will identify individuals with a potential diagnosis of type 2 diabetes through their own screening. A new recommendation is not to measure C-peptide and/or diabetes-specific autoantibody titres at initial presentation to distinguish type 1 diabetes from type 2 diabetes. It is now recommended that this should be done at a later date, if required. This is because such tests showed no evidence of distinguishing between the different types of diabetes on diagnosis.

Dietary recommendations

The NICE guidance recommends promoting

healthy eating and encourages at least 5 portions of fruit and vegetables per day. The benefits of physical activity and weight loss should be discussed sensitively at each and every contact, taking into account social and cultural considerations (NICE, 2015a).

There are strong links to the NICE guideline *Obesity: Identification, assessment and management*, which suggests that the whole family should be encouraged to make lifestyle changes (NICE, 2014). The primary aim is to enable healthy weight loss and prevent excessive weight gain. Healthcare professionals should also familiarise themselves with the NICE guidance *Preventing excess weight gain* (NG7; NICE, 2015b), which is referenced within the main document.

Healthcare teams should also look at what facilities are available locally in primary care to tackle childhood obesity and refer the young person to these services. These services can often provide tailored exercise and lifestyle education for the whole family.

Monitoring of weight/height and body mass index

Children and young people should have their weight and height recorded at each clinic visit, while respecting their privacy. Their body mass index (BMI) should be calculated and plotted on appropriate growth charts and these should be monitored closely as significant changes could indicate poor diabetes control.

Medication

There is very little guidance on medication for type 2 diabetes, with standard-release metformin recommended from diagnosis. Standard-release metformin can be poorly tolerated and some individuals can benefit from switching to a modified-release formulation. The dose should be titrated slowly and always taken with food. It is worth noting that the tablets are quite large. The recent NPDA suggested that there were a number of children between the ages of 5 and 9 years old, and more still in the age group 10–14 years old with type 2 diabetes. Children of this age may struggle to swallow these tablets. Therefore, some children may require a liquid or powder formulation (Paediatric Formulary Committee, 2016). The

guideline development group for NG18 advised that research should be undertaken looking at the long-term comparative clinical and cost effectiveness of different metformin preparations (NICE, 2015a).

Unlike adult guidance, there is no indication of how to intensify treatment if this monotherapy is inadequate. This is probably because there are currently no studies or data available for the guideline group to review. Therefore, advice should be sought from colleagues working in adult diabetes with regards to difficult cases. The only licensed option for young people would be insulin combination therapy (Zeitler et al, 2014).

HbA_{1c} Targets

The ideal HbA_{1c} target for young people with type 2 diabetes is the same as that for type 1 diabetes (48 mmol/mol [6.5%]), with the requirement to individualise targets taking into account lifestyle, comorbidities and daily activities.

Patient education

Education in type 2 diabetes is focused around diet, physical activity and reasons for glucose control. The young people and their families should receive written information on their medication and should be advised on monitoring for possible side effects. There is a greater emphasis on providing information about complications, especially cardiovascular complications and dyslipidaemia. As with all people with diabetes, they should be warned about the dangers of smoking and helped to quit if they have started smoking. Management of concurrent illness should be discussed, including testing of blood glucose and ketones at this time and when to make contact with diabetes team. Immunisations should be given as indicated in the Department of Health's *Green Book* (Department of Health, 2016) and they should have routine eye and dental checks.

Monitoring for complications.

All young people with type 2 diabetes should be screened for hypertension and dyslipidaemia from diagnosis and also screened for diabetic retinopathy and nephropathy from 12 years old. The healthcare professional should consider referral for ophthalmic screening earlier than 12 years, if there has been suboptimal diabetes control.

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1. Healthcare teams should also look at what facilities are available locally in primary care to tackle childhood obesity and refer the young person to these services. These services can often provide tailored exercise and lifestyle education for the whole family.
2. Body mass index should be calculated and plotted on appropriate growth charts and these should be monitored closely as significant changes could indicate poor diabetes control.
3. Education in type 2 diabetes is focused around diet, physical activity and reasons for glucose control. The young people and their families should receive written information on their medication and should be advised on monitoring for possible side effects. There is a greater emphasis on providing information about complications, especially cardiovascular complications and dyslipidaemia.

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1. Hypertension can be treated with angiotensin converting enzyme (ACE) inhibitors, although major congenital malformations have been reported with first trimester exposure to ACE inhibitors in non-diabetic women, so counselling is required in sexually active girls about this risk.
2. Dyslipidaemia should be monitored for by measuring total cholesterol, high-density lipoprotein (HDL) cholesterol, non-HDL cholesterol and triglyceride concentrations.
3. The challenge for the multidisciplinary team looking after children and young people with diabetes is that as they have so few patients with type 2 diabetes, there is a lack of resources or expertise in its management.

There is specific advice about the use of appropriately sized cuffs for blood pressure monitoring and repeating measurements in the 95th percentile by performing 24-hour blood pressure monitoring before diagnosing hypertension. Hypertension can be treated with angiotensin converting enzyme (ACE) inhibitors, although major congenital malformations have been reported with first trimester exposure to ACE inhibitors in non-diabetic women, so counselling is required in sexually active girls about this risk (Zeitler et al, 2014).

Dyslipidaemia should be monitored for by measuring total cholesterol, high-density lipoprotein (HDL) cholesterol, non-HDL cholesterol and triglyceride concentrations. This should be confirmed with a repeat sample, which could be fasting or non fasting. Treatment, other than lifestyle changes, are not discussed, although Zeitler et al (2014) have stated that statin therapy has been shown to be as safe and effective in children as in adults, and should be the first pharmacologic intervention. However, the use of statins in sexually active adolescent females must be very carefully considered and the risks explicitly discussed, as these drugs are not approved in pregnancy (Zeitler et al, 2014).

Surgery

There is no specific guidance for type 2 diabetes management during surgery, other than the requirement for written protocols and that the surgery is carried out in dedicated paediatric facilities, with healthcare professionals who manage children and young people with diabetes. In elective surgery, metformin should be discontinued at least 24 hours before the procedure. In emergency surgery and when metformin is stopped less than 24 hours before, optimal hydration should be ensured to prevent risk of lactic acidosis. The main concern regarding metformin therapy during surgery relates to this rare complication. Metformin has a long biological half-life (17–31 hours), hence the need to stop it at least 24 hours prior to surgery (Association of Children’s Diabetes Clinicians, 2013).

Psychological issues

The guidance about psychological support and screening is the same as that for type 1 diabetes,

with an emphasis on timely interventions and access to mental health practitioners. Screening for anxiety and depression should be performed when necessary, especially in those with poor control. There is no mention in the guidance of eating disorders in relation to type 2 diabetes, but healthcare teams should be aware that these can co-exist. The American Diabetes Association (ADA) suggests that binge eating disorder (also known as compulsive overeating) is characterised primarily by periods of uncontrolled, impulsive or continuous eating beyond the point of feeling comfortably full. While there is no purging, there may be sporadic fasts or repetitive diets and often feelings of shame or self-hatred after a binge (ADA, 2014).

Conclusion

The challenge for the multidisciplinary team looking after children and young people with diabetes is that as they have so few patients with type 2 diabetes, there is a lack of resources or expertise in its management. These young people are at considerable risk of long-term complications, especially cardiovascular problems. We should draw on the vast experience of our adult colleagues in our transitional clinics to discuss such cases in order to achieve optimal control, not only of blood glucose, but also hypertension and dyslipidaemia. ■

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