

NICE guidance on the management of type 2 diabetes: Implications for paediatric practice

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In 2002, NICE published five guidelines dealing with various aspects of care for people with type 2 diabetes. This year, an updated version of these guidelines was published. While the update's Guideline Development Group do not exclude the application of these new guidelines to children, they note that, due to the volume of work involved, they were unable to specifically address the paediatric literature. The Guideline Development Group suggest that when applying the guidelines to children and young people, healthcare professionals need to use their clinical judgment and refer to the *British National Formulary for Children* (Paediatric Formulary Committee, 2008). With this in mind, herein the author reviews the key recommendations of the NICE guidelines and discusses their implications in relation to the management and care of children and young people with type 2 diabetes.

Over 90% of people with diabetes have type 2 diabetes, with the prevalence of the condition in the UK increasing alongside the prevalence of obesity and decreasing physical activity (National Collaborating Centre for Chronic Diseases [NCCCC], 2008). In 2002, the number of children reported to have type 2 diabetes was small (only 102; Diabetes UK et al, 2004); however, this was a 36% increase on the previous year's figure. More recently, the *National Diabetes Audit* for 2004–2005 found that the number of children with type 2 diabetes, although still small – accounting for only 1% of all types of diabetes in the young – is increasing (Information Centre

for Health and Social Care [ICHSC], 2005). The largest group of young people with type 2 diabetes are between 12 and 15 years of age (54%), followed by the 16–24 (36%) and 5–11 (9%) age groups. Owen and Hattersley (2001) found that, in countries with a high prevalence of type 2 diabetes, such as the USA and Japan, there has been a 10-fold increase in adolescents with the condition since the 1980s, and that all countries have seen an increase in the prevalence among those aged 16–45 years.

The *National Diabetes Audit* for 2004–2005 (ICHSC, 2005) addressed the discrepancies that exist among rates of type 2 diabetes in various ethnic populations. The audit found

Article points

1. The application of the updated NICE type 2 guidelines to children has not been excluded by the Guideline Development Group.
2. When applying the NICE guidelines to children, healthcare professionals need to use their clinical judgement, bearing in mind the limited but growing evidence of the importance of early intervention and treatment.
3. Implementation of the guidelines needs to take into account the specific needs of children and young people with type 2 diabetes, including restriction of some of the treatment options available in those under 18 years of age.

Key words

- Type 2 diabetes
- Children
- NICE guidelines

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1. The increased prevalence of type 2 diabetes among young people, mainly of Asian origin, can be seen both nationally and locally and presents new challenges for paediatric nurses.
2. The recommendations offered by the NICE guidelines are not new with regard to the importance placed on delivering structured, evidence-based education conveyed by a trained educator.

more children in Black (5%) and Asian (9%) populations had type 2 diabetes than in the Europoid population (<1%). Ehtisham et al (2000) first published case reports of children with type 2 diabetes in the UK and found overweight Asian girls to be over-represented. This increased prevalence of type 2 diabetes among young people, mainly of Asian origin, can be seen both nationally and locally and presents new challenges for paediatric nurses. Due to early onset, children and young people with type 2 diabetes generally experience a longer duration of the condition than adults, and are thus at increased risk of complications and require careful management (Owen and Hattersley, 2001).

Earlier this year, the NCCCC published the NICE guidelines on the management of type 2 diabetes (NCCCC, 2008). These guidelines are an amalgamation and update of five previous guidelines dealing with different aspects of the management of type 2 diabetes,

published in 2002.

In the document, the Guideline Development Group note that the application of these guidelines to children has not been excluded but, due to the volume of work involved, they were unable to specifically address the paediatric literature. The Guideline Development Group advise healthcare professionals to use their clinical judgement when managing and treating children with type 2 diabetes, and refer to the *British National Formulary for Children* (Paediatric Formulary Committee, 2008). The guidelines include five key recommendations (see *Box 1*) that cover education, monitoring and treatment options, as well as the management of complications associated with type 2 diabetes.

This article examines the NICE recommendations for type 2 diabetes with reference to the implications for children and young people.

Box 1. Five key recommendations on the treatment and management of type 2 diabetes. (NCCCC, 2008).

- Offer structured education to every person and/or carer at diagnosis with annual reinforcement and review. Inform people that structured education is an integral part of diabetes care.
- Provide individualised and ongoing nutritional advice from a healthcare professional with specific expertise and competencies in nutrition.
- When setting targets for glycated haemoglobin: involve the person in decisions about their individual target; encourage maintenance of the target unless side effects impair their quality of life; offer therapy (lifestyle and medication) to help achieve and maintain the target set; inform the person that any reduction in HbA_{1c} towards the agreed target is advantageous to future health; and avoid pursuing highly intensive management to levels of less than 6.5%
- Offer self-monitoring to a person with newly diagnosed type 2 diabetes only as part of their self-management education. Discuss its purpose and agree how it should be interpreted and acted upon.
- When starting insulin therapy, use a structured programme employing active insulin dose titration that encompasses: structured education, telephone support, frequent self-monitoring, dose titration to target, dietary understanding, management of hypoglycaemia, management of acute changes in glucose control, and support from an appropriately trained and experienced healthcare professional.

Structured education

The recommendations offered by the NICE guidelines are not new with regard to the importance placed on delivering structured, evidence-based education conveyed by a trained educator. A number of previous guidelines stressed the importance of education in the management of diabetes (see NICE, 2004; Patient Education Working Group, 2005; Swift and International Society for Pediatric and Adolescent Diabetes, 2007). It is further recommended that education programmes meet cultural, linguistic, cognitive and literacy needs within the community they are delivered. Added to this, when looking at the paediatric population, information needs to be age-appropriate and tailored to address the whole family (Swift and International Society for Pediatric and Adolescent Diabetes, 2007).

A report published by the Department of Health (DH; Patient Education Working Group, 2005) noted that, for children and adolescents, many centres have education programmes but few of these are structured, use formal curricula or provide training for

educators in paediatric diabetes. The Guideline Development Group also found that health beliefs among adults in the Black and Asian populations were leading them to be less likely to see diabetes as a chronic condition, or one that is threatening to health.

In the author's experience, for Asian girls with type 2 diabetes, cultural barriers create a particular problem when educating their families about their condition. While English may be the young person's first language, other key members of the family may not speak English. Yet it is these family members who are essential in supporting the lifestyle changes and medication regimens required to manage type 2 diabetes in the young person. The challenge for paediatric diabetes teams, therefore, is to ensure that not only age-appropriate information on type 2 diabetes is available for the young person in question, but also that a structured education programme, accessible to the whole family, is available – which may include the use of an interpreter.

Nutritional advice

Nutrition management and education is one of the cornerstones of diabetes care (Aslander-van Vliet et al, 2007). Recommendations for this key NICE intervention recognise the need for advice sensitive to the individual's needs, culture and beliefs, with an emphasis on a healthy and balanced diet with the aim of achieving and maintaining a healthy body weight. However, for children and young people, nutritional guidance must recognise the need for sufficient and appropriate energy intake required for growth and puberty (Aslander-van Vliet et al, 2007). For some children, keeping weight steady rather than losing weight is the ideal, with healthcare professionals keeping a close eye on height and weight centiles appropriate for the age group.

This recommendation also highlights the importance of lifestyle changes in conjunction with dietary advice, such as increasing physical activity levels. The importance of exercise, along with healthy eating, in reducing the risks associated with obesity is

also highlighted in other guidelines addressing paediatric diabetes (NICE, 2004; Aslander-van Vliet, 2007). The challenge for healthcare professionals here is how to encourage young people to spend less time in front of video games or the television, and spend more time walking or engaging in sports such as swimming, as advised by NICE guidance on obesity (NICE, 2006).

In the author's experience, increasing levels of physical activity is particularly hard for Asian girls, for whom it may be culturally inappropriate to be out alone or participating in mixed-gender activities. An initiative was developed at our diabetes clinic in Birmingham that facilitated Asian girls with type 2 diabetes attending a gym with other girls of the same cultural background. Unfortunately, of the eight girls in our care at the time, only one took up the programme. However, with the number of Asian girls being diagnosed with type 2 diabetes growing, it is this type of initiative which may prove useful. It is important to remember that any small increase in physical activity can help to reduce the risk of diabetic complications, and increase general good health. Thus, encouraging children with type 2 diabetes to walk to the local shops or get off the bus to school one stop early will have beneficial effects.

Family members are also crucial in supporting young people with diabetes to manage both dietary and lifestyle changes (NICE, 2006). A report from the DH (2007a) also highlights the importance of schools in encouraging children with diabetes to take up sports, with the aim of increasing physical activity within and beyond the school curriculum. Closer links between healthcare professionals and schools need to be considered when supporting young people and their families in managing type 2 diabetes.

Self-monitoring and setting targets for control

In many respects, the NICE recommendations with regards to setting individual targets

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1. Paediatric diabetes teams need to ensure that not only age-appropriate information on type 2 diabetes is available for the young person in question, but also that a structured education programme, accessible to the whole family, is available.
2. For children and young people, nutritional guidance must recognise the need for sufficient and appropriate energy intake required for growth and puberty. For some children, keeping weight steady rather than losing weight is the ideal.
3. Any small increase in physical activity can help to reduce the risk of diabetic complications, and increase general good health.
4. Closer links between healthcare professionals and schools need to be considered when supporting young people and their families in managing type 2 diabetes.

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1. It is important to remember that therapy is rarely stable with the changing treatment needs of the growing child, particularly with psychological and hormonal changes experienced during adolescence.
2. In view of the increased risk of complications in young people with type 2 diabetes, healthcare professionals need to ensure that blood glucose targets are monitored more regularly than recommended, even when control appears stable.
3. Medication adherence is where families can be of great support to a young person with diabetes.
4. Some recommended therapies can lead to weight gain, something which young girls in particular dislike and that can lead to non-adherence.

to maintain or improve HbA_{1c} levels, while taking into account quality of life, reflect those in the NICE guidelines for children and young people with type 1 diabetes (NICE, 2004). There are some differences between the documents in recommendations on how frequently HbA_{1c} levels are measured, and the appropriateness of self-monitoring of blood glucose.

In the paediatric diabetes setting, targets for control and blood glucose monitoring are essential in achieving good glycaemic control and so helping to prevent the acute and chronic complications of the condition. (Rewers et al, 2007). When following the NICE type 2 diabetes guidelines, it is important to remember that therapy is rarely stable with the changing treatment needs of the growing child, particularly with psychological and hormonal changes experienced during adolescence (Rewers et al, 2007).

In view of the increased risk of complications in young people with type 2 diabetes, early intervention and achievement of treatment targets is of particular importance (Pinhas-Hamiel and Zeitler, 2007). Implications for paediatric practice, therefore, are to ensure that blood glucose targets, once set, are monitored more regularly than recommended – even when control appears stable. NICE recommends self-monitoring of blood glucose from the time of diagnosis in adults, with healthcare professionals assessing technique and interpretation of results. Both self-monitoring of blood glucose by the young person with diabetes and regular monitoring of glycaemic control (HbA_{1c}) by the healthcare professional are essential in the management of type 2 diabetes.

Treatment options

The treatment options recommended by the NICE guidelines were researched by the Guideline Development Group using only data currently available for adults with type 2 diabetes. Some of the treatment recommendations are applicable to the

paediatric diabetes setting, while others are less suitable. Of the treatment options recommended in the NICE guidelines, it is important to note that many are not licensed for use in those under 18 years of age.

As the majority of young people with type 2 diabetes are overweight or obese at diagnosis (Owen and Hattersley, 2001), first-line treatment tends to be metformin. Unfortunately, in our diabetes clinic we have experienced problems with the acceptance of metformin by young people, mainly because of the gastrointestinal side effects, but also as the result of the recipients forgetting to take the tablets. The gastrointestinal side effects of metformin can be reduced by starting the young person on a small dose and gradually increasing it to a therapeutic level. Medication adherence is where families can be of great support to a young person with diabetes, especially in helping them to remember to take tablets. It is also important to be aware of the need to monitor liver and renal function when metformin is being used in young people.

Some recommended therapies (e.g. the sulphonylureas, insulin) can lead to weight gain, something which young girls in particular dislike and that can lead to non-adherence (Aslander-van Vliet, 2007). However, there is evidence that indicates continuing metformin with insulin reduces weight gain (NCCCC, 2008), which has also been seen in paediatric practice (Owen and Hattersley, 2001).

More intensive treatment options are also considered within the NICE guidelines if basal or premixed insulin regimens fail to offer adequate control. When considering the lifestyle issues of any adolescent, basal-bolus regimens fit in far better with the varied routines that they encounter in school and other social settings. Additionally, our experience shows that this regimen is preferred by young Asian people with type 2 diabetes as it allows for late evening meals that families often prefer, particularly during religious festivals such as Ramadan where fasting can influence adherence.

Complications

Because of the high risk of micro- and macrovascular complications in people with type 2 diabetes, monitoring and treatment for these complications are recommended from the time of diagnosis. Early intervention is especially important in young people with type 2 diabetes so as to reduce the risk of early-onset diabetic complications (Owen and Hattersley, 2001).

Monitoring for complications in the paediatric population is only recommended from 12 years of age, and monitoring of lipid levels is not recommended at all (Rewers et al, 2007). However, while most young people with type 2 diabetes are at least 12 years of age, annual monitoring for complications, including lipid levels, is essential for all young people with the condition, and should be carried out from the time of diagnosis.

It is suggested that young people with type 2 diabetes should commence treatment with agents such as angiotensin-converting enzyme inhibitors and statins, as early as possible to slow the progression toward renal complications (Owen and Hattersley, 2001; Pinhas-Hamiel and Zeitler, 2007). It is also important to note when treating younger women that some of these drugs are contra-indicated during pregnancy.

Conclusion

In reviewing the NICE guidelines for the management of type 2 diabetes, several issues need consideration when applying these recommendations to the paediatric population. Because of the high risk of diabetic complications in this group, management priorities need to include the monitoring and early treatment of weight, blood pressure, lipids and microalbuminuria. Further, the inclusion of families and schools in supporting young people with type 2 diabetes is an essential part of helping them to manage their medication regimen and the lifestyle changes necessary to reduce the risk of diabetic complications (NICE, 2006; Aslander-van Vliet et al, 2007; DH, 2007b).

The challenge for healthcare professionals is

to be aware of the particular needs of young people with type 2 diabetes, and to tailor education and support programmes to be age-appropriate, and culturally and linguistically sensitive so as to best address both the young person and their family. ■

Aslander-van Vliet E, Smart C, Waldron S (2007) ISPAD Clinical Practice Consensus Guidelines: Nutritional management in childhood and adolescent diabetes. *Pediatric Diabetes* 8: 323–39

Department of Health (2007a) *Improving Diabetes Services: The NSF Four Years On*. Department of Health, London

Department of Health (2007b) *Making Every Young Person with Diabetes Matter*. Department of Health, London

Diabetes UK, Royal College of Nursing, Royal College of Paediatrics, Child Health and British Society for Paediatric Endocrinology and Diabetes (2004) *The National Paediatric Diabetes Audit: Results from audit year 2002*. Diabetes UK, London

Ehtisham S, Barrett TG, Shaw NJ (2000) Type 2 diabetes mellitus in UK children – an emerging problem. *Diabetic Medicine* 17: 867–71

Information Centre for Health and Social Care (2006) *National Diabetes Audit: Report for the audit period 2004–2005*. The Information Centre for Health and Social Care, Leeds

National Collaborating Centre for Chronic Conditions. (2008) *Type 2 Diabetes: National Clinical Guideline for Management in Primary and Secondary Care (update)*. Royal College of Physicians, London

NICE (2004) *Type 1 Diabetes: Diagnosis and Management of Type 1 Diabetes in Children and Young People*. NICE, London

NICE (2006) *Obesity: Guidance on the Prevention, Identification, Assessment and Management of Overweight and Obesity in Adults and Children*. NICE, London

Owen K, Hattersley AT (2001) The young patient with Type 2 diabetes: A diagnostic and therapeutic challenge. *Modern Diabetes Management* 2: 10–4

Paediatric Formulary Committee (2008) *British National Formulary for Children*. Paediatric Formulary Committee, London

Patient Education Working Group (2005) *Structured Patient Education in Diabetes: Report from the Patient Education Working Group*. Department of Health, London

Pinas-Hamiel O, Zeitler P (2007) Acute and chronic complications of type 2 diabetes mellitus in children and adolescents. *Lancet* 369: 1823–31

Rewers M, Pihoker C, Donaghue K, Hahas R, Swift P, Klingensmith GJ (2007) ISPAD Clinical Practice Consensus Guidelines: Assessment and monitoring of glycaemic control in children and adolescents with diabetes. *Pediatric Diabetes* 8: 408–18

Swift PG, International Society for Pediatric and Adolescent Diabetes (2007) ISPAD clinical practice consensus guidelines 2006–2007. *Pediatric Diabetes* 8: 103–9

Page points

1. Annual monitoring for diabetic complications among young people with type 2 diabetes is essential and should be carried out from the time of diagnosis.
2. Management priorities for young people with type 2 diabetes need to include the monitoring and early treatment of weight, blood pressure, lipids and microalbuminuria.
3. The inclusion of families and schools in supporting young people with type 2 diabetes is an essential part of helping them to manage their medication regimen and the lifestyle changes necessary to reduce the risk of diabetic complications.
4. Healthcare professionals need to be aware of the particular needs of young people with type 2 diabetes, and tailor education and support programmes so as to best address both the young person and their family.