Nutrition and diabetes: global challenges for children and parents

Sheridan Waldron

Many children around the world are starving or undernourished. In contrast, obesity and type 2 diabetes in children are major problems in many countries. These contradicting nutritional crises strongly affect the way we care for children with diabetes and their families. Recent international guidelines on the care of children with type 1 diabetes and type 2 diabetes recognize that effective nutritional management and the adoption of a healthy lifestyle can improve diabetes outcomes. Emphasis is placed on good glycaemic control to prevent blindness, kidney failure and early death – often associated with heart disease. In this article, the author describes the specific nutritional challenges in diabetes management that are unique to each country, region, family and child, and calls for individualized approaches to optimize care.

Children and young people face a lifetime of diabetes. In the ideal world, dietary management and lifestyle advice must aim to maintain quality of life as well as considering blood glucose control. Tragically, however, many children with type 1 diabetes die because they are misdiagnosed or diagnosed late and insulin is unavailable. In Mozambique, a person with type 1 diabetes is likely to die within one year of diagnosis. This situation creates little need for long-term dietary advice.

In contrast, in the developed world, the nutritional care of childhood type 1 diabetes is changing rapidly with the introduction of multiple insulin injections and pump therapy. These changes require an increased intensity of nutrition education, similar to the Diabetes Control and Complications Trial (DCCT)[1], and the use of carbohydrate counting to facilitate insulin adjustment.[2]

The global rise of obesity has contributed to the emergence of type 2 diabetes in childhood, a serious condition demanding a different nutritional approach. The changes in society that have created this situation are complex, and for many countries childhood obesity is a major public health problem that has alerted governments to introduce drastic measures (see the article by Francine Kaufman in this issue). Successful interventions must include lifestyle modification with decreased energy intake and increased physical

activity. Such changes in behaviour are fraught with difficulty.

Dietary recommendations

Dietary recommendations are well-established for children and adults with diabetes.[3,4] Dietary targets are clearly focused on carbohydrate management to optimize blood glucose control, reduce complications, and improve dietary elements that may prevent heart disease.[3] Some children with type 1 diabetes can achieve dietary targets but many other children find them difficult to achieve for a variety of reasons.[5]

Factors influencing eating habits

Local eating habits are based on complex and dynamic social systems. Differences in food intake occur for many reasons, such as economics, food legislation, food availability, local agriculture, urbanization, mechanization, advertising, culture, religion, customs, food preference, myths, peer pressure, educational levels, and others.

A recent survey that was sent to dietitians and diabetes educators in 36 countries showed wide variations in the recommendations.[6] For carbohydrate, recommendations varied from 40% of total energy in the Netherlands to 70% in Bangladesh. The high carbohydrate intake in developing countries is important and is due to the high cost of protein-rich foods.

High intakes of fats, sugar, processed foods and unhealthy snacks and convenience foods were reported in the developed world, along with large portion sizes. While developing countries may have less access to processed food, they have rapidly changing food patterns that are often associated with advertising, such as increases in fizzy, sugary drinks (also linked to the emergence of rapid tooth decay).

In addition to poor availability of food, many common myths surrounding diabetes and eating habits worsen the situation, such as severe restriction of fruits and starchy vegetables.

Table 1: Simple dietary modifications with practical targets
Eat a variety of foods at each meal and throughout the day.
Spread the consumption of carbohydrates throughout the day – portions of starchy carbohydrate at each meal and snack (if necessary), eg rice, potatoes, noodles, pasta, bread, pulses (peas, beans, lentils).
Use local low-cost sources of protein, eg pulses, fish, lean meat, and eggs if available.
Eat a variety of fruit and vegetables every day – ideally five servings per day.
Reduce sugar and sugar-sweetened foods, especially fizzy drinks, sweets or cakes, condensed milk.
Reduce fat, especially animal fats and fatty foods by cooking with less fat, cutting fat from fatty meat before preparation, reducing pastry, cakes and biscuits; use low fat dairy products.
Use vegetable oils with unsaturated fats, eg olive oil or sunflower oil.
Reduce sodium/salt intake.
Reduce snacks and fast foods that are high in calories, fat, salt and sugar. Replace these with low-sugar alternatives, such as cereals, nuts and fruit.

Complementary therapies may further add to the complexity for example, using bitter gourd as medicinal food.[7] (For more on complementary therapies, see *Diabetes Voice* 2006, issue 3.)

So, food availability and affordability is a problem for many; for others, food abundance is the villain.[6] Therefore, any advice and education for families must be sensitive to local food habits, customs and myths. Education should start by improving individual aspects of the diet as illustrated in Table 1, these simple guidelines should improve glycaemic control and protect against heart disease.

> **Dietary goals need to be negotiated with the child and family.**

Educational tools

A variety of practical education tools are available to improve knowledge and promote dietary change. An example is the International Diabetes Federation *Diabetes Education Modules*.[7] Approaches range from simple nutritional education to more sophisticated forms of carbohydrate management. It is imperative that the tools are chosen carefully to suit the needs of individual children (taking into account age and maturity) and families, especially as children are in a state of continual change. As children develop and grow, education needs to be repeated and adapted. It is not always possible for children and families to accomplish all aspects of a healthy diet. Therefore, achievable dietary goals need to be negotiated with the child and family.

Nutritional targets should include increasing consumption of fruit and vegetables.

Major dietary challenge

Type 1 diabetes

In the developing world, there is a need to educate parents about the nutritional importance of regular low-cost local starchy carbohydrate to balance insulin whenever available, and promote affordable sources of protein, unsaturated fats and fruit and vegetables.

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In the developed world, education needs to be carefully selected for each child and family. However, the use of rapid- and long-acting analogues has provided an opportunity to improve nutrition education with focused attention given to carbohydrate management (amount and type) and the adjustment of insulin. This type of approach requires repeated family-centred education to stabilize glycaemic control, and maintain the emphasis on healthy food options, whilst supporting and maintaining good quality of life. Further evaluation of educational interventions is needed in different cultures to establish effective programmes.

Obesity and type 2 diabetes

Adult and childhood obesity is due to over-nutrition relative to energy expenditure, and is an ever-increasing global problem of immense proportions. Children who develop type 2 diabetes in association with obesity usually have family histories of both obesity and diabetes. Obesity prevention and treatment programmes must be directed at whole families. These can be used for both type 1 diabetes and type 2 diabetes and need to include effective strategies that promote behaviour change. Evidence suggests that family-based weight management approaches that target parents and emphasize healthy home environments are more likely to be successful than emphasizing only weight reduction.

The home environment is where children learn and practise dietary and physical activity behaviours.

Targets should include increasing fruit and vegetable consumption, substituting water for sweetened beverages, encouraging healthy low-calorie snacks, controlling portion sizes, making more healthy food choices away from home, increasing physical activity and decreasing sedentary behaviour. Families are a critical target for interventions because the home environment is where children learn and practise dietary and physical activity behaviours.[8] It is essential for children to observe parental modelling – food selection, eating behaviour, and food preparation practices. Also, parents make foods available in both the home and outside the home.

Support and communication

A sensitive and supportive but educational relationship with the child and family/carers is essential for dietary change. Dietary advisors must develop open, trusting, respectful and non-judgemental relationships. Knowledge alone does not change eating habits, so behavioural approaches to education, using motivational techniques are more likely to be successful.[7] Evidence also suggests that if parents play an active role in the care of diabetes, all outcomes improve.

Future directions

Further research is required into effective educational interventions that achieve and maintain good glycaemic control and healthy lifestyles. Global changes in lifestyles, especially in eating and physical activity are urgently needed. Healthier foods should be consumed, physical activity must increase and sedentary pursuits need to be reduced to prevent the disastrous consequences of obesity and diabetes. Effective interventions that make and sustain these changes in both children with type 1 diabetes and those with type 2 diabetes are particularly important to reduce complications in these already vulnerable groups.

Sheridan Waldron

Sheridan Waldron is a diabetes specialist dietitian at the Dorset County Hospital, Dorchester, UK. She is a member of the IDF Consultative Section on Diabetes Education.

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