Outcomes of a local adolescent education programme in Northern Ireland

Rhonda Bleakly, Alison McKee

Article points

1. A local audit examined glycaemic control in adolescents and the effects of multiple daily injection therapy.
2. Diabetes UK (2005) advises that education is more efficient when conducted in a group.
3. The results following adolescent education sessions showed an overall improvement in HbA_{1c} levels and diabetes knowledge.

Key words

- Adolescents
- Education

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In Northern Ireland there are currently no paediatric diabetes structured education programmes available, and there is still much evidence of inequality in patient care and education (Diabetes UK, 2005). This article discusses the development and results of an education programme for adolescents with type 1 diabetes.

The UK has been reported to have poorer glycaemic control, higher rates of diabetes complications and impaired quality-of-life among young adults than the rest of Europe (Wills et al, 2003). In the past it was necessary to adhere to dietary restrictions and accept regular blood glucose testing and injections as part of daily routine to achieve optimal glycaemic control – structured education programmes can offer freedom from this rigid lifestyle.

Providing diabetes education to people with diabetes, parents and carers is acknowledged as an effective way of reducing both short- and long-term complications (Diabetes Control and Complications Trial [DCCT] Research Group, 1993; Knight et al, 2006; International Society for Paediatric and Adolescent Diabetes [ISPAD], 2007). For some people, however, adolescence continues to be a time of risk-taking behaviour, highlighting the importance of developing relationships between adolescents with diabetes and healthcare professionals.

DSNs play a key role in the attainment of improved adherence and health outcomes, highlighting partnership through education as a fundamental component of diabetes care (Bodenheimer et al, 2005).

Background

Throughout the UK, a small number of centres provide paediatric education programmes based on the adult DAFNE (Dose Adjustment for Normal Eating) programme (DAFNE Study Group, 2002), which has been shown to significantly improve glycaemic control and quality-of-life. This is sustained at 12 months with no increase in severe hypoglycaemia.

The success of the DAFNE programme prompted the diabetes team in Sheffield to develop KICk–OFF (Kids in Control of Food. Although initial results of the pilot study for KICk-OFF did not demonstrate improvement in HbA_{1c} levels following the course, parents and children have reported improved quality-of-life and greater child responsibility for a range of tasks (Waller et al, 2008).

In Ipswich, the family-centred structured education, FACTS (Families, Adolescents and

Children's Teamwork Study), has successfully been implemented into their routine clinic, which is both cost-effective and time-saving for staff (Wadham et al, 2005).

Currently in Northern Ireland there are no paediatric diabetes structured education programmes available, resulting in inequality of patient care and education (Diabetes UK, 2005). Recently there has been much interest in ongoing pilot studies of a carbohydrate and insulin adjustment programme developed locally for young people (Carbohydrate and Insulin Calculation [CHOICE] programme), which is based on the German Berger programme (Chaney, 2009).

Work has also been undertaken by the paediatric Managed Clinical Network in Northern Ireland to address the recommendations of the National Service Framework for diabetes (Department of Health, 2003) for provision of structured education suitable for all children and adolescents. This is welcome information for healthcare professionals involved in delivering diabetes education, and will address recommendations from NICE (2004) regarding the provision of education for young people with type 1 diabetes.

Rationale

A local audit carried out in 2007 examined glycaemic control in adolescents and the effect of multiple daily injection (MDI) therapy. The audit findings revealed that the adolescent group were not achieving recommended HbA_{1c} levels of 7.5% (58 mmol/mol; NICE, 2004). This was not surprising, as results from the Fourth National Paediatric Audit confirmed that over 80% of children in the UK are failing to achieve target HbA_{1c} levels (Diabetes UK, 2005; Edge et al, 2005). A similar study in Northern Ireland showed that only 20% of children achieved a target HbA_{1c} level of 7.5% (58 mmol/mol) or less (Cardwell et al, 2006).

Adolescence is characterised by rapid growth, hormonal changes, and a drive towards independence, during which patterns of health behaviour are established and these tend to be continued during adult life (Royal College of Paediatric and Child Health, 2003). Consequently, those who fail to develop positive health behaviours regarding diabetes management are putting themselves at risk and can have a reduced life expectancy (DCCT Research Group, 1993).

Recommendations from the DCCT (1993) and NICE (2004) are that all individuals with type 1 diabetes should receive intensive insulin therapy. However, MDI regimens alone may not necessarily improve glycaemic control (Holl et al, 2003). NICE (2004) recommend that structured education should be made available to everyone with diabetes, with education provided at diagnosis and on an ongoing basis. The programme offered should be suited to the age and social learning needs of the person with diabetes (ISPAD, 2007).

Due to advances in modern insulin therapy and NICE recommendations, some diabetes centres in Northern Ireland are commencing children on MDI regimens from diagnosis. In other centres, adolescents who have been on twice-daily insulin regimens have been changed to MDI regimens in an attempt to improve glycaemic control. Lack of adequate support for those on MDI may leave a deficit in knowledge and a lack of confidence to alter insulin dose. This may result in insulin doses remaining fixed if the adolescents are reluctant to make changes independently. If glycaemic control remains poor this may be perceived as a failure of MDI, when in fact inadequate education may be a contributing factor.

Often there are limitations to providing education and information about insulin regimens during routine clinic sessions as the clinic may be busy and adolescents may have insufficient time to ask questions or learn the skills required to optimise their glycaemic control. Group education programmes may provide a suitable alternative learning environment.

Programme development

Following attendance at the staff training on the BERTIE (Bournemouth Structured

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2. A local audit carried out in 2007 examined glycaemic control in adolescents and the effect of multiple daily injection therapy. The audit findings revealed that the adolescent group were not achieving recommended HbA_{1c} levels.

Page points

1. Following attendance at the staff training on the BERTIE (Bournemouth Structured Education) programme for adults with type 1 diabetes, the team adapted the programme for use with adolescents.
2. The target age group was 14–16 year olds with type 1 diabetes on multiple daily injection therapy or wishing to commence it.
3. The information from the focus group gave direction as to how the BERTIE programme could be adapted to meet the needs of the adolescents.

Education) programme (Everett et al, 2003) for adults with type 1 diabetes, the team adapted the programme for use with adolescents.

The adapted programme took place one day per week over 4 weeks. The study workbook used on the BERTIE programme provided excellent reference notes on the topics to be covered. However, some parts were not suited to the specific age group so the workbook was reduced to suit the needs of the target population.

In modifying any adult-based curriculum for use with a paediatric population, differences in learning styles between adults and children have to be considered, with a need to pitch the information to the cognitive ability of the individual (Higgs et al, 2005).

The target age group was 14- to 16-year-olds with type 1 diabetes on MDI therapy or wishing to commence MDI therapy. The diabetes clinic register was used to identify 15 adolescents meeting the criteria. Individuals with learning difficulties were excluded due to the mathematical nature of parts of the programme. These 15 adolescents and their parents were invited to attend a focus group that was held in the hospital paediatric department.

Focus group

The aim of the focus group was to provide an arena for the adolescents to help structure their own education sessions. Eight adolescents and four parents attended and received information regarding the proposed content of the education sessions. Ice-breaker tasks were used to introduce the group members before the group was divided. A variety of structured open-ended questions were used and views of parents were collected separately from the adolescents to give opportunity for the participants to express their views independently. The same questions were asked to both groups. The parent group was led by the paediatric DSN and the adolescent group was led by the dietitian.

The main findings included the choice of venue, suggested topics for discussion and suggested length of sessions, with all expressing a preference to meet outside the hospital setting. The adolescents did not feel it would be useful to have parents present for the sessions, and they did not want the sessions to interfere with their school or social activities. The adolescents were keen to learn through practical, informal sessions and parents agreed that the learning needed to be fun to maintain attendance.

In paediatric diabetes there is generally greater involvement of the family, who supervise and support, and the quality of health depends on the young person's understanding and compliance to their treatment, working in partnership with their parents (Rousseau, 2007). It was important, therefore, that parents were included in the focus group, received information on the proposed education sessions and gave their views on structuring the content.

Programme structure

The information from the focus group gave direction as to how the BERTIE programme could be adapted to meet the needs of the adolescents. The diabetes team agreed that the programme should be delivered after school in four 2-hour sessions at weekly intervals in the local leisure centre.

The eight adolescents who attended the focus group were invited to attend. Of these, five attended on four consecutive Wednesday evenings. The sessions involved a mixture of group discussions, reflection, and practical application (*Box 1*). Support materials used during the sessions included parts of the workbook produced for BERTIE, posters, flip-charts and monitoring diaries. Use of visual aids, behavioural learning and group discussion have been found to be more effective than didactic teaching methods presenting a substantial effect on the educational experience (Farrow, 2003).

A meal was taken together each evening, and this facilitated discussion of carbohydrate estimation in different foods. The young people brought packed lunch on two evenings, which gave opportunity to read

labels and identify healthy and unhealthy choices. Carbohydrate reference tables were provided by the dietitian.

The adolescents were asked to keep a record of their blood glucose levels, insulin dose and carbohydrate taken at each meal. These diaries were used as a basis for discussion each week. All sessions were led by the diabetes team, which consisted of a senior doctor, dietitian and DSN, with the exception of the exercise sessions, which were led by a trained instructor

Discussion

The learning needs of each individual were assessed through an initial multiple choice knowledge questionnaire adapted by the diabetes team, which included questions on carbohydrate foods, insulin action and hypoglycaemia treatment. An identical questionnaire at the end of the 4 weeks provided a tool to assess knowledge gained.

Evaluation of the knowledge questionnaires showed an overall improvement in diabetes knowledge, ability to carbohydrate count and adjust insulin. Feedback on the suitability of the venue and content of the sessions was also positive, although some found concepts of the carbohydrate counting and calculation of insulin to carbohydrate ratios difficult to grasp due to differences in mathematical ability.

Education programmes offered as part of intensified treatment interventions can result in improvements in metabolic control and reductions in complications (Loveman et al, 2003; Murphy et al, 2007). HbA_{1c} levels were recorded before the sessions and at intervals of 3, 6, 9 and 12 months. These were recorded during routine clinic visits. There was a small improvement in HbA_{1c} after 3 months for four of the adolescents, and a slight deterioration in one case (*Table 1*).

A social evening for the group was arranged after 3 months to assess retained knowledge and self-management skills. This session revealed that the young people sometimes found the carbohydrate-counting time-consuming, and did not always take the time to count accurately. Positively, the group were now regularly taking correction doses of insulin when glucose levels were high, and reported overall improvements in blood glucose measurements. In general, the improvement in glycaemic control was sustained at 6 and

Table 1. HbA_{1c} levels before and after the education programme.

		HbA_{1c} level % (mmol/mol)			
Patient	**Pre-education**	**3 months**	**6 months**	**9 months**	**12 months**
1	12.0 (108)	11.9 (107)	10.9 (96)	11.1 (98)	11.0 (97)
2	10.0 (86)	9.3 (78)	8.8 (73)	8.0 (64)	8.5 (69)
3	8.0 (64)	7.5 (58)	7.9 (63)	6.8 (51)	7.3 (56)
4	8.1 (65)	8.4 (68)	8.6 (70)	8.5 (69)	8.3 (67)
5	7.5 (58)	6.8 (51)	7.5 (58)	7.3 (56)	7.8 (62)

Box 1. Session outlines.

Session 1:
- Introductions of team and group
- Introduction to aims and objectives of sessions
- Pre-course questionnaire
- General physiology of diabetes
- Carbohydrate counting and food labels
- Weighing foods and portion estimation

Session 2:
- Discussion of diaries from previous week
- Practical session: group cook meal together
- Estimation of carbohydrate in meal
- Calculation of carbohydrate to insulin ratio
- Injection technique
- Insulin regimens and blood glucose monitoring

Session 3:
- Management of exercise
- Insulin adjustment and correction bolus
- Discussion of diaries from the previous week
- Hypoglycaemia
- Practical exercise session

Session 4:
- More exercise
- Hyperglycaemia
- Insulin adjustment for sick days
- Review of carbohydrate counting
- Take-away meal: pizza
- Post-course questionnaire
- Evaluation

Page points

1. Despite evidence regarding the value of structured education, it remains a fact that only the motivated individual will want to engage on this level.
2. Reluctance for group education may be due to a belief that it is like being back at school, being talked at, or that people used to individual education are simply loath to change.
3. Educational intervention is key to improving knowledge, self-care and ultimately glycaemic control.

9 months, with one exception. HbA_{1c} levels showed a very slight increase in two cases after 12 months. These results suggest that more regular contact with the diabetes team offers valuable support in achieving glycaemic control and maintains motivation.

Despite evidence regarding the value of structured education, it remains a fact that only the motivated individual will want to engage on this level (DAFNE Study Group, 2002; Everett et el, 2003; Sämann et al, 2005). Those who attended the programme were motivated and wanted to learn diabetes management skills but, as with other adolescent health issues, it would appear that those who require the most help are the most difficult to engage (Viner et al, 2003).

The programme was structured to give variety in learning styles and practice-based sessions, and the small attendance was slightly disappointing. Reluctance for group education may be due to a belief that it is like being back at school, being talked at, or that people used to individual education are simply loath to change. The Department of Health (2005), acknowledges that groups are not for everyone and that one-to-one support should still be provided.

As well as being cost-effective, group education also promotes sharing of knowledge and experience among participants by encouraging interaction and peer support, and improves relationships between people with diabetes and healthcare professionals. Diabetes UK (2005) advises that patient education is more efficient when conducted in groups, and suggests the period immediately after diagnosis as an optimal time for learning. Offering education at this time may increase uptake and attendance of future groups.

Conclusion

Educational intervention is key to improving knowledge, self-care and ultimately glycaemic control (ISPAD, 2007). Evaluation of the programme provided evidence of the programme's positive impact with regard to how the participants managed their diabetes. Increases in diabetes knowledge, as demonstrated in the post-course questionnaire and the slight improvements in HbA_{1c} levels, were encouraging; however, the small sample size of the group evaluated mean that it was not possible to generalise the results to the whole adolescent population.

To measure the effectiveness of this local initiative further studies are required, with results evaluated over a longer timeframe to confirm whether improvements are sustained and significant. Overall the team felt this was a useful experience, and based on the results and personal experiences it was possible to make suggestions for changing practice.

Among healthcare professionals, nurses are ideally placed to initiate and reinforce patient education, which must be considered a fundamental component that cannot be ignored due to lack of time or resources. According to Loveman et al (2003), whatever model of patient education chosen, it is important that staff provide a high-quality structured education programme that is clinically and economically effective and acceptable to people with type 1 diabetes. ■

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