A survival guide to the children's diabetes clinic

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Abstract

Over the last 10 years the model of optimal care for children with diabetes has undergone significant changes in the UK. These changes include the introduction of Best Practice Tariff (BPT), the adoption of electronic patient records for diabetes in many centres and other rapidly evolving technology. The changes hope to optimise and standardise care, however they also have had an important impact on the running of diabetes clinics. This review is intended to help prepare healthcare professionals for the complex demands of a modern paediatric diabetes clinic and should help with understanding the multiple facets.

Keywords continuous glucose monitoring system (CGMS); diabetes clinic or MDT clinic; diabetes control; glucose monitoring downloads; glycaemic control; insulin pump therapy; intensive insulin therapy; multiple daily insulin (MDI); paediatric diabetes; type 1 diabetes

Introduction

Diabetes is the second commonest chronic disease in childhood, affecting at least 25,000 children and young people (CYP) in the UK, with a prevalence of one in 500. Over 95% of children have type 1 diabetes, an autoimmune condition leading to destruction of the insulin producing beta cells in the pancreas. The remaining have type 2 diabetes, a complex non-immune disorder associated with insulin resistance, ethnicity, familial tendency, diet and obesity or other rare forms.

Diabetes incidence is increasing by 4% per year, particularly in the under fives; one of the more challenging groups to care for due to the small doses of insulin needed and erratic eating and exercise patterns.

The children's diabetes clinic

Organisation and delivery of services – who, how, where and when?

Children's diabetes clinics are held for CYP under the age of 19 years and are usually age banded as a minimum into a children's clinic and young person's service. The young person's (YP) clinics also focus on preparation for the transition to young adult services.

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BPT standards require CYP to be offered four multidisciplinary team (MDT) clinics per year. These clinics need to include as minimum a consultant or senior doctor specialised in diabetes care, the paediatric diabetes specialist nurse (PDSN) and a dietician. Other professionals may also be accessible, including psychologists and social or family support workers. It is very important for *all* healthcare professionals training in paediatric diabetes to develop effective interpersonal skills and communication strategies which optimise the performance of the MDT. This requires good understanding of the breadth of MDT member's roles.

The majority of MDT clinics are hospital based, due to issues with costs, venues, access to near patient testing of glycated haemoglobin (HbA1c) and facilities to download blood glucose (BG) meters, insulin pumps, and continuous glucose monitoring systems (CGMS) offsite. This is mandatory to enable comprehensive review and analysis of patient information.

The timing of any proposed clinics needs careful consideration particularly for older children; attending four MDT appointments per year, diabetes self-management education programmes, and nursing and diet reviews impact on school attendance. As YP focus on their studies for GCSEs, AS and A Levels this can lead to non-attendance, culminating in failure to access essential support and practical advice during a period of significant physical change and uncertainty. Disengagement around transition puts the YP at high risk of dropping out of diabetes care with subsequent complications. Consequently, some services offer MDT clinics extending into early evening.

Whilst MDT clinics are compulsory some services offer other supplementary clinics, including drop in services, specific clinics to support those with high HbA1c, and regular hospital PDSN visits, enabling frequent review between MDT clinics. Telemedicine-clinics, via telephone or skype, have been successful in supporting YP to improve their control, as have clinics held by dietitians and PDSNs at secondary schools. Less formality and frequent face to face contact can promote a more relaxed atmosphere for the YP, building trust, better engagement and successful collaboration.

The purpose of the MDT clinic

Why has this model evolved?

Multidisciplinary clinics allow a holistic patient approach whilst ensuring key care processes are completed. Screening for associated disorders (thyroid disease and coeliac disease) and identifying, monitoring and addressing short (hypoglycaemia, hyperglycaemia, DKA) and long term complications (growth failure, obesity, hypertension, microalbuminuria, hyperlipidaemia) are facilitated through MDT clinics including one formal annual review of care, health and complications. The annual review includes screening for microvascular complications (nephropathy, neuropathy and retinopathy). Height, weight, BMI and blood pressure are assessed at each visit.

Annual assessment of whether formal psychology input is required ensues at the MDT clinic, or annual PDSN review, utilising questionnaires such as Problem Areas in Diabetes (PAID) or paediatric quality of life inventory (PEDSQL).

Whilst it is essential to recap and review diabetes practices and habits at clinic visits, families and young people are

disillusioned if repeatedly asked the same questions by different doctors at each visit. Continuity is difficult to achieve as a specialty trainee, requiring you to invite patients back to specific clinics where you know you are attending.

Transition

Ready, steady, go

Preparing CYP for independence in diabetes care and transition to young adult care requires specific consideration, in line with the national service specification for transition. Explaining confidentiality, practicing seeing professionals alone for all or part of a consult and easy access and direction to appropriate resources e.g. smoking, driving, careers, drug use and diabetes, and sexual health are essential. Assessment of readiness for transition is integral to clinical care throughout. Clinic environment, and waiting area can create a relaxed atmosphere to foster peer to peer support. Throughout consults engaging young people in determining their goals and preferences for follow up can enhance motivation.

Professional roles in clinic

Sharing roles and responsibilities is the key to optimal care and use of resources

There is a degree of overlap in the roles of professionals in clinic and it is important that CYP and families can indicate the professionals they wish to see. Resourceful use of clinic time, and avoiding one professional trying to address all issues at once is key to good clinic flow. This is challenging, with limitation of rooms for professionals, and must be considered in the planning of services.

A senior diabetes nurse simply downloading devices is poor use of professional time. Having a support worker to do this frees up PDSNs to hold joint consultations with the doctor or dietitians. However the Diabetes Nurse downloading the meter or pump in a separate room together with the patient accords opportunity for confidential dialogue, leading to disclosure of issues a young person might not feel comfortable to raise with the consultant or in presence of their parents.

Psychology input in MDT clinic supports team members with challenging consults, and helps reluctant CYP to engage with psychology services. Demonstration and discussion of consultation skills, and psychology approaches to the disengaged is advantageous for trainees and established team members.

Approaching the consultation

Be interested: a broader appreciation of the child and family life will help you give the best advice

Key pieces of information are sought at each clinic. At the outset determine what the CYP and their carer would like to talk about and find out what's going on in their lives at the moment: have they just had exams, have they just won the local football league, are they dancing in a show, going off on holiday, or just returned? What are they doing in and outside school? This is the exciting part and enabling identification of important factors potentially affecting the control. It's difficult to put treatment and advice into context if you fail to ascertain current and recent significant events and changes. Appreciating their priorities, taking time to listen, and addressing their concerns improves rapport and promotes clinic attendance.

Current treatment

Insulin regime type should be reviewed. The majority of children in England use basal bolus insulin (57%) and in line with the NICE guidance CG18 commence at diagnosis. This involves one or two basal insulin injections per 24 hours and rapid insulin given, based on Insulin to carbohydrate (ICR) with meals, together with a correction dose based on the amount of reduction in BG achieved by giving one unit of insulin (ISF). Insulin pump therapy (23%) provides a continuous subcutaneous infusion (CSII) of rapid acting insulin delivered by a programmable pump with pump boluses pre-meals and for corrections. Few (4%) receive three times daily insulin, a mixture of rapid and intermediate insulin in the morning, a bolus of rapid insulin at evening meal and long acting insulin at bedtime. Up to 5% are on twice daily insulin, a pre-mixed insulin comprising rapid and intermediate insulin in a fixed percentage given before breakfast and evening meal. See Table 1 for insulin types and action profiles.

Multiple factors impact on diabetes control; understanding how they time insulin for meals and snacks, how they use corrections, how frequently they should, and choose to give insulin is important in providing advice and determining the appropriateness of their current regimen. It is not uncommon for recommended mealtime insulin adjustments to not be adhered to because the change makes the calculation more difficult. This is often a good time to talk about using a blood glucose (BG) meter with bolus advisor function.

Timing of insulin doses

A clear understanding of the timing of insulin dosing is essential

Whilst rapid analogue insulins were initially marketed as suitable for administration before, during or after meals, it is now clear that timing impacts on post-prandial glucose levels. Repeatedly high post-prandial levels will raise the HbA1c, and contribute to long term complications.

Giving insulin after eating makes optimal glycaemic control difficult

The more frequently insulin is given after eating, the greater the frequency and duration of post-prandial hyperglycaemia, due to the absorption lag time, present even with rapid insulin. It is recommended to give rapid insulin 10–15 minutes before meals. When insulin is given post-prandially the insulin levels peak in the blood stream late, which is obvious through sustained hyperglycaemia (Figure 1). Moreover, a portion of the glucose from carbohydrate in the food will have spilt over into the urine during post-prandial hyperglycaemia, as the renal threshold for glucose is exceeded. There is now excess insulin for the remaining available glucose leading to later hypoglycaemia and swinging glucose levels.

If it is not identified that the insulin is being administered inappropriately post-prandially an incorrect assumption is made that the mealtime ICR must lead to an inappropriately high insulin dose. The ICR is incorrectly adjusted to reduce mealtime insulin exacerbating post-prandial hyperglycaemia.