

Editorial

Pediatric and adolescent multidisciplinary diabetes team care

The article by Goss et al. (1) in this issue of the journal highlights what many of us in the field of pediatric and adolescent diabetes – even adult diabetes – think we have known for some time. A multidisciplinary team approach where all the professional team members practice with the *same* philosophy of care and in which *targeted* improvement of glycemia occurs must include improved self blood glucose monitoring and education on how to use such monitoring results. It must also include attention to identify the philosophy of care and treatment goals in addition to specific and dedicated attention to psychosocial factors (2). Family cohesion, depression and substance abuse, self-esteem, and behavioral issues as well as learning styles – and even the existence of a coordinated educational process – can be positive or negative factors when living with a chronic disease such as diabetes mellitus. These psychosocial factors could also include personal or societal financial barriers such as those discussed in the rural Australian setting in this paper. There may also be financial or other barriers in inner cities around the world where poverty, levels of family education, or even neighborhood safety issues interfere with getting to clinic, being able to read and communicate with health care providers, or having access to physical activity. Other barriers to health care include disorganization of care, the lack of a cohesive treatment philosophy, or lack of any targeted glycemia goal at all. In some parts of the world, in rich and poor countries alike, the lack of resources for basic monitoring or even insulin are the barriers to be overcome. In others where specific financial or institutional resources are not lacking, inattention to family issues, alcohol or drug use, attention-deficit disorders or learning differences as well as concomitant co-morbidities such as other illnesses like celiac disease may constitute barriers to improved glycemia.

Goss et al. are to be congratulated for defining a problem in rural Australia and creating their own solution. It just goes to show what dedication can achieve when coupled with interest in becoming knowledgeable and self-taught. The results are even more impressive because they did not start with an

already trained pediatric or adolescent diabetologist but ‘just’ an interested pediatrician consultant. But this is not ‘just’ a consultant, this is a physician who learned the key concepts about controlling glucose levels with the only dogma being the importance of involving patients and families, involving a team of professionals and offering these services in a manner that would facilitate cooperation and improvement. Unifying this approach to treatment in order to improve education (3) and glycemic outcome was a goal they identified and this is verified in the reports of the Hvidore ongoing study (4). Although the Hvidore centers continue to show significant center-to-center differences in outcome (5), analysis of why this may be so, and why there has been no significant improvement in A1c levels over time has been somewhat controversial. Even when such centers were identified as being average (the yellow centers) but not ‘the best’ (the green centers) or ‘significantly worse’ than others (the red centers), most of us would expect there to be great internal or external pressure to improve upon an individual center’s A1c results for the general benefit of patients or out of sheer competitiveness. But this has not been the case with the Hvidore center cohort.

In this rural Australian cohort, the authors correctly identified a problem of poor care provision, identified some possible explanations, and sought to make process corrections to ameliorate the problem. They succeeded! This was by no means a perfect solution for them because the A1c levels still remained too high. But, they did achieve significantly lower A1c levels than when they first started, and significantly improved A1c year by year over the 4-yr time span of their report. Quality of life improved. Patient satisfaction improved. Ease of access to all disciplines of educators – medical, nursing, dietary, and psychosocial – also improved and actually was utilized by the vast majority of the patients and their families. Further scientific studies could occur if other researchers were to utilize this same approach and might include validated studies of self-efficacy (6), family cohesion (7) and functioning, and additional quality of life measures (8) besides their own quality

Editorial

of life scale. The authors are absolutely correct that their reported improvement has broad implications for short-term and long-term reduction not only in cost of care but also in all the well-known complications associated with type 1 diabetes mellitus in children and adolescents (9–14).

To assemble a dedicated team that talks and works together may sound easy. It took those of us involved with writing the protocols for the now famous Diabetes Control and Complications Trial (DCCT) a year to define our tasks. When the DCCT ‘proved’ conclusively the benefit of targets for glycemia, we valued even more greatly the dedication of our excellent teams (15). In some cases, the physicians were the main movers in helping patients succeed in reaching DCCT goals. In many other cases, the nurse educators or dietitians were the key to these successes. In most centers, the team approach clearly identified different aspects of care that previously had been taken for granted or not recognized, but patients and their families spoke of the benefits of the team approach that was so important compared to just seeing an individual doctor or nurse – and this comment occurred in all the DCCT centers. Another key benefit of the DCCT was its ability to demonstrate that more frequent – and more consistent – care was also extremely helpful. One of the questions I had when reading this report from Australia was whether there would be any discussions on or possibility to improve glycemic control further, not only with more pump treatment but simply by more frequent care, e.g., team visits every month or every 6 wk rather than quarterly visits for those who were not achieving their defined goals. In our own team practice at NEDEC (New England Diabetes and Endocrinology Center), we offer much more frequent follow-up than the other centers around us (2). Our own A1c results are similar to those of Professor Harry Dorchy in Brussels (16), and we believe that such targeted, individualized care, along with more frequent consultations with all our staff, has resulted in low (7%) A1c values without added severe or frequent hypoglycemia, even within a single-center large patient population of more than 500 subjects. There are many other examples around the world. Philosophy of care, identifying optimal glycemic targets for the individual, working through an empowerment strategy to try to reach such targets safely and without excessive hypoglycemia, can involve multidose insulin regimens, more frequent blood glucose monitoring, teaching about insulin pumps and also about greater flexibility of food and insulin without strict dogmas defining what must be done. Rather, the goals at NEDEC and at so many other successful centers (e.g., the green Hvidovre centers) maximize flexibility while simultaneously defining steps of improvement. In reading about our Australian colleagues in their

report, I would expect there will be continued lowering of A1c values with their insulin pump program and with their unified and impressive multidisciplinary team approach to such care provision.

After the DCCT was concluded and those of us involved had to decipher some of the DCCT conclusions, I struggled with what the DCCT message was going to be. As I lectured about diabetes around the USA and Canada, and also in eastern Europe, Latin America, the Middle East, Africa, and Asia, the similarities and the problems were much more alike, although there were always individual and unique differences to overcome either in health care systems, supplies, finances, or even societal issues. The obvious need for improvement in A1c levels and lowering of overall glycemia was the important point to be conveyed to my audiences – to challenge them to establish their own goals and to figure out how they might move toward achieving them with their patients. The critically important decreases in retinopathy, nephropathy, and neuropathy were also extremely valuable because they were proved in prospective and randomized fashion. Since then, the follow-up DCCT-EDIC (Epidemiology of Diabetes Intervention and Complication) (11–13) studies have added cardiovascular improvement to the list. Other studies from other centers (15) have confirmed that excess hypoglycemia is not automatically to be expected with improved glucose control. Even when there was more severe hypoglycemia, not a desired outcome, improving glycemia and lowering A1c values was shown to be significantly more important for psychosocial and mental functioning as well (17, 18). In many other studies, improved A1c was also documented with much less severe hypoglycemia than had been reported in the DCCT centers. Dorchy (16), Pinelli (19), de Beaufort (20) and our own team at NEDEC all have reported successful lowering of A1c values in children and adolescents with type 1 diabetes mellitus utilizing multiple daily injections (MDI) and continuous subcutaneous insulin infusion (CSII) – despite having different insulin strategies and different timing/types of meals. All have the common goal of maximizing education, empowering the patient and his or her family toward optimizing such goals but doing so safely (21). Now the task of the international pediatric diabetes community will be to replicate these results in other centers and not to rest until the lowering of A1c results can be accomplished through adaptation of such multidisciplinary, coordinated, and same philosophy care. Quite a challenge!

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