

## Challenges of Therapy in Children with Diabetes

### *How to Treat Very Young Children*

There has been much debate about the development of complications due to diabetes that has its onset in the childhood years, with some arguing that these years don't count as much as when diabetes develops later on in life. Ragnar Hanas, MD, Uddevalla Hospital, Sweden, discussed the results of several studies indicating that intensive management at younger ages, while difficult, provides long-term benefit.

In one study, Olsen showed that while those whose diabetes onset occurs during the teenage years develop retinopathy sooner, the highest probability of complications is among those with earliest onset of diabetes [Olsen BS et al. *J Diabetes Complications* 2004]. Similar evidence of the importance of intensive management comes from older research that evaluated complications among those diagnosed with diabetes between 1922 and 1935 who were treated with strict diet and multiple daily (and through the night) injections versus those diagnosed from 1935 to 1945 when long- and intermediate-acting insulin had become available. After 15 years of diabetes, 9% of those diagnosed before 1935 developed retinopathy as compared to 61% diagnosed after 1935 [Johnson S. *Diabetes* 1960]. "This was an important message that was very much forgotten by the scientific community," Dr. Hanas explained.

For children less than 6 years of age, the American Diabetes Association glycemic control goals are HbA1c 7.5%-8.5% because of high risk for severe hypoglycemia that is associated with cognitive impairment. Most recently there have been concerns over the danger of impaired brain development with hyperglycemia.

Brain damage with diabetes has been a subject of controversy for some time. Christopher Ryan, MD, University of Pittsburgh School of Medicine, Pennsylvania, United States, presented a new hypothesis this year at the annual American Diabetes Association meeting. According to Dr. Ryan, hyperglycemia that occurs early in life negatively affects brain structure and development through demyelination of white matter, which makes the brain more vulnerable to subsequent injury (eg, hypoglycemia, head injury, alcoholism, other CNS conditions). Thus, according to Prof. Hanas, there is a window during which, with intensive management, we can provide these children with some protection against future injury.

Prof. Hanas next turned to the challenges of implementing intensive therapy while preserving quality of life for the child and family. He offered advice for clinicians: "It is our job to adjust the insulin doses to the child, not the other way around." Also, he urged families to continue with their ordinary activities as much as possible and to preserve "ordinary parent-child rules in the family."

Children need to be taught to rotate their injection sites to avoid lipohypertrophy, which can lead to decreased insulin absorption. When injection pain becomes problematic, use of indwelling catheters can ease discomfort and lead to improved glycemic control.

In Sweden, absolute indications for use of a pump include infants and small children in whom insulin administration in adequate doses is difficult, in children with feeding difficulties, and in those with needle phobia and recurrent severe hypoglycemia. Relative indications include high variability in plasma glucose, tendency toward ketosis and for general quality-of-life improvement.

*Highlights from the  
European Association  
for the Study of  
Diabetes Annual  
Meeting 2007*

Prof. Hanas concluded, “I think the best we can do for our young children is to give them as good a start as possible through helping them achieve a low HbA1c.”

*Psychological Aspects in Children and Adolescents with Diabetes*

There have been great advances in diabetes care over the years, with better drugs, better glucose testing and sophisticated drug delivery devices—all resulting in reduced late complications. “But while modern treatment may be better, it is still a heavy burden,” stated Johnny Ludvigsson, MD, Linköping University, Sweden. He began by cautioning his audience that he is a pediatrician, not a psychologist, and his presentation would be personal and *not* balanced or scientific.

Because treatment according to the best and latest evidence is actually more complicated with more injections, more reliance on blood glucose determinations, more knowledge about diet and more skill in adjusting insulin doses—compliance is crucial and *motivation* remains the key to maintaining optimal treatment. “In spite of all our efforts, teams, and modern devices, many children and teenagers hate their diabetes.” Many patients have a decreased quality of life, and depression and low self-esteem are more common among those with diabetes. Furthermore, anorexia, bulimia, and suicide are all overrepresented in diabetic populations. Also, even with active insulin treatment and carbohydrate counting, the most delicious foods need to be avoided.

Once diabetes has been diagnosed, the tone of life changes and is characterized by “musts,” “shoulds,” “have tos,” prescriptions, reminders, rules, and principles. On top of that are requirements, threats, and demands. For teenagers whose natural impulse is to test and push against boundaries, their lives are dragged in the opposite direction by “don’ts” and by strict time requirements regarding injections and meals and medical visits. “No wonder some patients give up!” Prof. Ludvigsson commented.

What can pediatricians do? “Our attitude/policy and care at diagnosis is crucial,” he said. Most important is the caregiver’s ability to listen and empathize, and to affirm the range of the newly diagnosed patient’s feelings and questions. Information must be given honestly, but with optimism. The messages that life will not be “normal” and that rules have to be followed have to be conveyed, but so does the message that life can be “long, exciting, and happy.” It is important to be aware, as well, that communication goes beyond words to body language and tone of voice.

The time period around diagnosis, the pediatrician needs to remember, is a psychological crisis for both patient and family. Efforts to include the family and other key people in the education process are important. Furthermore, the attitude that needs to be developed is that learning occurs through the problems that arise. Therefore, questions are to be expected, and the pediatrician can be expected to make sure that understanding and solutions are available.

When HbA1c is high, the underlying causes can be many, including wrong advice, inadequate science, and the patient’s own fluctuating hormones or behaviors. For solutions to be found, an atmosphere of mutual confidence based more on encouragement than criticism is crucial. “We can like the patient, but dislike the disease/metabolic control—and convey the message: You are good, but your HbA1c is too high. Diabetes is our common enemy!” Out of a foundation of collaboration, short-term goals and realistic agreements can be established. In view of the complexities of modern regimens, Prof. Ludvigsson concluded, “The fundamentals of treatment of diabetes in children and adolescents—insulin, love, and care—are more relevant than ever before.”

**MITRE Study Results continued from page 12**

The study population included individuals  $\geq 18$  years of age with insulin-requiring diabetes ( $\geq 2$  injections/day), diabetes duration  $> 6$  months, and two consecutive HbA1c measurements  $\geq 7.5\%$ .

Mean age was  $\sim 52$  years (55% men) with 57% having type 1 diabetes. Mean HbA1c, which was 9.1% at baseline, declined in all groups, although the effect waned over time. At 18 months, the reduction was 1% for the GlucoWatch group and between 4% and 5% for the other groups, with no significant differences at any time point. In the GlucoWatch group 15% of patients achieved a reduction of 12.5% from baseline HbA1c versus 29% in the CGMS group. None of the differences was significant at any time point.

Monitor use declined over time, with 20% continuing to use the GlucoWatch and 67% continuing to use CGMS. Hypoglycemic events were similar between groups. CGMS-derived information tended to alter clinical feedback more than that from GlucoWatch.

Prof. Newman concluded, “There was no group effect on HbA1c of minimally invasive monitors relative to attention control or standard control.” He commented also that with all groups showing a sustained HbA1c reduction, trial participation may have led to improved metabolic control, obscuring any effects of devices.