

Trials and tribulations of managing type 1 diabetes

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ABSTRACT

Effective type 1 diabetes mellitus (T1DM) management tools are education, empowerment, insulin, and diet control. Exercise should be of moderate intensity so as to avoid hypoglycaemia. It is prudent to ensure that the required insulin levels are achieved in all children in order to manage the disorder well. The total daily dose of insulin may be 0.6–1.0 u/kg body weight, and it may be 2/3, 1/3 for split mixed insulin, and 50/50 for multiple subcutaneous injections. The dosages for the pump also vary from child to child. Basal bolus regimen is important and necessary in all T1DM children. It is not necessary to use all types of insulin analogs in all T1DM children, and the decision should depend on cost and delivery limiting factors. The advantages of using analogues are that some of these exhibit low hypoglycemic events (especially nocturnal events with basal insulin) and a few offer flexibility of administration to patients (most prandial analogs and some basal analogs).

Key words: Changing diabetes in children, insulin analogs, type 1 diabetes mellitus

INTRODUCTION

The simple principles in management of type 1 diabetes mellitus (T1DM) children are knowledge, common sense, and compassion. Every child, however, has a persistent need to manage hypoglycemia and is afraid of the complications thereof.^[1]

A 5-year-old boy was detected diabetic upon being worked up for excessive urination. His weight was 23 kg (reduced by 3 kg), random blood sugar was 571 mg/dl and hemoglobin A1c (HbA1c) was 4.5%. The alert lab personnel asked the patient to be rushed to the clinician without any further delay. The child with his parents arrived at the hospital at 1800 h. He was thirsty, not vomiting and had his snacks prior to the hospital visit. The child was in shock with the diagnosis of diabetes for a very long time. Other nonadjustable surprises for the child were immediate need

for insulin, immediate change in diet (type and pattern), monitoring, tackling hypoglycemia, learning all these parameters, and learning many new things. This child was advised diet changes, initiated on multiple subcutaneous injections (MSI) and hypoglycemia and sick day rules were explained. The child was enrolled in the changing diabetes in children (CDiC) program, provided numbers to contact, and has now gained 2 kg weight, in the visit 1-week later, with following glycemic parameters: Fasting plasma glucose 145 mg/dL and postprandial plasma glucose 143 mg/dL.

The clinicians and healthcare professionals (HCPs) however have to take into consideration that all children are not T1DM patients (certainly not the neonates) and not all adults are necessarily type 2 diabetes mellitus (T2DM) patients. Useful tools in the diagnosis and confirmation of T1DM are clinical sense, insulinopenia (C-peptide, ketones), evidence of autoimmunity, antibodies to pancreatic islets, and glutamic acid decarboxylase. These children can be treated as T1DM patients when in doubt whether it is T1DM or T2DM.

Effective T1DM management tools are education, empowerment, insulin, and diet control. Exercise, however, may not be necessary in these children if they have well-controlled blood sugars. Exercise should be of moderate intensity so as to avoid hypoglycaemia.

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The normal endogenous secretory pattern of insulin^[2,3] is necessary to be mimicked with exogenous insulin injections in all T1DM patients, which sometimes is difficult with children at school. The HCPs and parents, however, have to make sure that the levels are achieved in all children in order to manage the disorder well.

The total daily dose may be 0.6–1.0 u/kg body weight, and it may be 2/3, 1/3 for split mixed insulin, and 50/50 for MSI. The dosages for the pump also vary from child to child. There is nothing like a fixed dose of insulin and would depend on a number of factors including meals, current glucose levels, past responses, and awareness of hypoglycemic events. Basal bolus regimen is important and necessary in all T1DM children.

It is not necessary to use all types of insulin analogues in all T1DM children, and the decision should depend on cost and delivery limiting factors. The advantages of using analogues are that some of these exhibit low hypoglycemic events (especially nocturnal events with basal insulin) and a few offer flexibility of administration to patients (most prandial analogues and some basal analogues).

It is advisable to prescribe affordable insulin and delivery devices for children. And these should be made available to the patients at discounted price, and may even take help from support agencies (CDiC etc.), and the doctors may even contribute from their own pockets towards insulin prices for needy children. All deserving children should have access to insulin, and the public is urged to apply all available methods and sources for the same.

Diabetic ketoacidosis is one of the major complications of T1DM. It should be avoided at the outset with early recognition, in any known diabetic patient. Suspicion should be raised in any child who is not a known diabetic.

Diabetes affects children at the personal and emotional level. The child has various phases of emotional adjustment, starting with the initial diagnosis to almost 8–10 months when he starts feeling good again despite being diabetic. The first shock of diagnosis puts the child in distress/despair with denial, in the provisional adjustment phase, lasting up to almost 2 months. This leads the patient to phases of inner contradictions and inner crisis with uncertainty, loss of confidence, confusion, and depression and may last up to 6 months. After this phase, the phase of re-construction

and recovery commences in the child, with variations amongst individuals, and most of them are able to recover from the shock by 8–10 months after diagnosis. This needs utmost support and care from family and school. In addition, the other challenges faced by a T1DM patient are transition from clinics, change of HCPs, education, marriage, pregnancy, and psychosocial issues.^[4]

Monitoring is the key to success and glycemic parameters including glucose monitoring should be done every day and HbA1c testing should be done once in 3 months. The nonglycemic parameters including lipids, occurrence of microalbuminuria, chances of retinopathy and also thyroid stimulating hormone, anti-tissue transglutaminase, cortisol, and Na⁺/K⁺ should also be monitored at regular intervals.

Advances in diabetes therapy impose more side effects than treatment efficacy. Various new therapies including stem cell therapy, insulin patch, immuno-modulation, artificial pancreas, and islet cell transplant have been developed which impose more heat than light for the patients.

SUMMARY

Type 1 diabetes mellitus is the less cared for disorder, considered difficult and messy to treat, and is shunned by most people in the society. Managing this disorder has many aspects, and none of them are insurmountable but needs compassion from people involved. Gratification is evident in the eyes of the treated children and their families, and it is always a happy moment to be a reason for someone's smile.

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