

ASK EXPERT: Type 1 diabetes in children – Multiple medical and non-medical reasons for blood glucose fluctuations



Dr P V Rao,

Head, Department of Endocrinology and Metabolism, Nizam's Institute of Medical Sciences, Hyderabad

Type 1 diabetes and why it happens

Every cell in our body needs glucose to fuel its activities and grow. This fuel namely glucose comes from the breakdown of the food that we eat. The beta cells of pancreas release the hormone insulin, to help glucose, enter the cells in our body. Children with type 1 diabetes do not produce any insulin, which results in high blood glucose levels. There are multiple causes attributed for absence of insulin, autoimmunity being one of the primary cause. These children require insulin from external source. A few children testing negative for autoimmunity may do well without insulin injections.

Blood Glucose fluctuations

It's normal for blood sugar levels to fluctuate throughout the day, however, in people with diabetes, it can go to extreme high and low levels. In spite of taking care, a child with type 1 diabetes suffers from two episodes of hypoglycaemia per week and one episode of severe hypoglycaemia per year.¹ On the other extreme, even after taking best precautions, people with type 1 diabetes develop high

blood glucose levels which can if not treated in time lead to a bad condition called DKA.

Why does such variation happen?

Many things contribute to fluctuations in the blood sugar levels of someone with type 1 diabetes. Let's try to understand few of them:

- Wrong insulin, i.e., taking long acting insulin when short acting must have been taken
- Less effective insulin due to inappropriate storage
- Taking insulin at the wrong time or wrong site (place) for injection
- Accidentally taking wrong dose
- Not eating food on time or in the recommended quantity
- Time, intensity and type of physical activity (Moderate aerobic activities can cause a reduction in blood sugar levels and intense exercise can cause a temporary rise).
- Any kind of illness which includes cold, fever, tooth infection, mental stress, or anger can lead to release of counter regulatory hormones which leads to release of extra glucose from liver and muscles and lead to raised blood glucose levels.
- Other hormones
- Some medications like steroids, as well consumption of alcoholic beverages can cause fluctuations in blood glucose levels.

Actions which can help - Monitoring & Treating

The best way to avoid severe blood sugar level fluctuations is to understand and get educated about diabetes and its treatment plan.

- Monitor blood glucose levels at various times of the day to understand effect of meals, activities and other factors which can cause blood glucose fluctuations.
- It is essential to know the pattern of blood glucose readings as it gives the background for comparison. Isolated readings can be of little help.
- Any reading is meaningless without knowing the story behind it. The story includes, food intake, quantity and time, physical activity, mental stress, illness, and sleep patterns.

- It is not only essential to measure, but also record these circumstances along with blood glucose levels to get a more complete picture.

Check with your doctor and your health care team if you have any other questions.

Treating type 1 diabetes

The main aim of treatment is to maintain glucose levels within normal range, which corresponds to 70-130 mg/dL before a meal and less than 180 mg/dL two hours after the meal.² Blood glucose readings need to be in target range to prevent the complications of diabetes. For children with type 1 diabetes, no other treatment works other than insulin. A child with type 1 diabetes needs to take insulin on regular basis and match the food intake and exercise according to the action and dose of insulin.

Ultimate goal for treatment

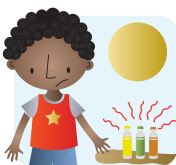
The ultimate goal of treatment is to keep blood glucose levels near normal at most of the times to prevent both short and long term complications. The fact remains that people with type 1 diabetes can live long and healthy lives with proper diabetes education and appropriate medical care.

Current Indian Scenario

Adequate management of type 1 diabetes requires an ecosystem of care. Extremely high or low blood glucose levels are hard on the body and can result in both short and long term complications. To maintain blood glucose levels near normal levels, medical review and diabetes education needs to be done at periodic intervals. Treatment needs change more frequently in children as they are growing constantly. The financial burden of treatment for a child with type 1 diabetes is huge & lack of proper diabetes education because of scarce resources results in sub-optimal treatment and suboptimal outcomes for the child.

Changing Diabetes in Children (CDiC) program

Novo Nordisk Education Foundation along with 21 specialized centres across India is trying to address the critical gap in the management of type 1 diabetes through its CDiC program. More than 4000 children registered in the program are provided with diabetes care, which includes free human insulin, diagnostics, glucose monitoring, consultation and diabetes education from the specialist. Apart from improving access to care, the program also incorporates education and counselling about diabetes and its management for children as well as health care professionals.



If you would like to have more information on type 1 diabetes you can write to us at-

Diabetes Educator

Novo Nordisk Education Foundation
168, 2nd cross, Domlur, 2nd Stage, Bangalore 560071

1. Cryer PE: Hypoglycemia in Diabetes: Pathophysiology, Prevalence, and Prevention. Alexandria, Va., American Diabetes Association, 2009, p. 2. ADA Recommendations 2014