Fasting guidelines for diabetic children and adolescents

Kiswhar Azad, Fauzia Mohsin, Abdul Hamid Zargar[1], Bedowra Zabeen, Jamal Ahmad[2], Syed Abbas Raza[3], Samin Tayyeb, Sarita Bajaj[4], Osama Ishtiaq[5], Sanjay Kalra[6]

Paediatrics, BIRDEM and Ibrahim Medical College, Dhaka, Bangladesh, [1]Department of Endocrinology, Advanced Center for Diabetes and Endocrine Care, Srinagar, [2]Rajiv Gandhi Centre for Diabetes and Endocrinology, J. N. Medical College, Aligarh Muslim University, Aligarh, India, [3]Endocrinologist, Shaukat Khanum Cancer Hospital and Research Center, Lahore, Pakistan, [4]MLN Medical College, Allahabad, India, [5]Endocrinologist, Shifa International Hospital, Islamabad, Pakistan, [6]BHARTI Hospital and B.R.I.D.E., Karnal, India

ABSTRACT

Fasting during the month of Ramadan, the ninth month of Islamic lunar calendar, is obligatory for all healthy adult and adolescent Muslims from the age of 12 years. Fasting starts from early dawn (Sohur/Sehri) till sunset (Iftar). During this period one has to abstain from eating and drinking. Islam has allowed many categories of people to be exempted from fasting, for example, young children, travelers, the sick, the elderly, pregnant, and lactating women. According to expert opinion, patients with type 1 diabetes (type 1 DM) who fast during Ramadan are at a very high risk to develop adverse events. However, some experienced physicians are of the opinion that fasting during Ramadan is safe for type 1 DM patients, including adolescents and older children, with good glycemic control who do regular self-monitoring and are under close professional supervision. The strategies to ensure safety of type 1 diabetic adolescents who are planning to fast include the following: Ramadan-focused medical education, pre-Ramadan medical assessment, following a healthy diet and physical activity pattern, modification in insulin regimen, and blood glucose monitoring as advised by the physician.

Key words: Adolescent, Ramadan, type 1 diabetes

Fasting during the month of Ramadan, the ninth month of Islamic lunar calendar, is obligatory for all healthy adult and adolescent Muslims from the age of 12 years. Fasting starts from early dawn (Sohur/Sehri) till sunset (Iftar). During this period one has to abstain from eating and drinking. Islam has allowed many categories of people to be exempted from fasting, for example, young children, travelers, the sick, the elderly, pregnant, and lactating women. Major risks associated with fasting in diabetic patients include hypoglycemia, hyperglycemia, diabetic ketoacidosis, dehydration, and thrombosis. Fasting is not meant to create excessive hardship on the Muslim individuals according to religious tenets. Nevertheless, many patients with type 1 diabetes (T1DM) insist on fasting during Ramadan, thereby creating a challenge for themselves and their health care providers. Following are the patients with diabetes who are in a very high-risk group who fast during Ramadan[1]:

- Severe hypoglycemia within the 3 months prior to Ramadan
- A history of recurrent hypoglycemia
- Hypoglycemia unawareness
- Sustained poor glycemic control
- Ketoacidosis within the 3 months prior to Ramadan
- Type 1 diabetes
- Acute illness
- Hyperosmolar hyperglycemic coma within the previous 3 months
- Performing intense physical labor

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Corresponding Author: Dr. Fauzia Mohsin, Associate Professor, Department of Paediatrics, BIRDEM General Hospital-2 (Mohila O Shishu), 1/A, Ibrahim Sharani, Shegun Bagicha, Dhaka-1000, Bangladesh. E-mail: fauzia_mohsin@yahoo.com

- Pregnancy
- Chronic dialysis

Some experienced physicians are of the opinion that fasting during Ramadan is safe for type 1 DM patients, including adolescents and older children, with good glycemic control who do regular self-monitoring and are under close professional supervision.[2-4]

Following recommendations can be made for adolescents who are in good health and who wish to fast[1-5]:

Individualization

Management plan must be individualized for each patient according to the need.

Ramadan-focused patient education

The role of structured education for patients is well established in the management of diabetes. This should be extended to Ramadan-focused diabetes education. Patients should receive education regarding the following:

1. Self-monitoring of blood glucose at home.
2. Focus on the causation, early recognition, and emergency management of hypoglycemia, hyperglycemia, dehydration, and impending diabetic ketoacidosis.
3. Meal planning and dietary advice.
4. Timing and intensity of physical activity.
5. Compliance to medications.

Pre-Ramadan medical assessment

1. Preferably undertaken 1–2 months before the fasting month starts.
2. Physical status, glycemic status, and appropriate blood studies.
3. Look for any acute and chronic complications and individual risk stratification to identify those not fit to fast.

Diet and nutrition

1. Ingestion of large amount of foods rich in carbohydrate and fat during Iftar should be avoided.
2. Meal at Sehri should contain complex carbohydrate, as this will delay digestion and absorption (slow-digesting foods). This should be taken as late as possible.
3. Inclusion of fruits, vegetables, lentils, yogurt, cereal (e.g., puffed rice).
4. Fluid should be taken liberally during nonfasting hours.

Exercise and physical activity

1. Normal level of physical activity should be maintained.
2. Rigorous exercise during fasting hours should be avoided.

Checking glycemic status

1. Under Al Shariaa and Al Fatwa law, neither blood testing nor administration of insulin is forbidden and neither is considered to invalidate the fasting state. Patients should be encouraged to do frequent home monitoring.
2. Urine should be checked for ketone if blood glucose is high (>15 mmol/L).

Breaking the fast

1. Patient should break fasting if blood sugar levels are low (<4 mmol/L) or patient experiences signs/symptoms of hypoglycemia and if blood glucose level is >16.7 mmol/L.
2. Patient should avoid fasting on sick days.

Insulin Regimens for Type 1 Diabetic Patients

It is fundamental to adjust the insulin regimen for good glycemic control during Ramadan.

It has been shown that the incidence and frequency of hypoglycemia were lower in patients taking insulin lispro instead of soluble insulin as the short-acting component.[4] Basal–bolus insulin regimens, with use long-acting synthetic analog (e.g., insulin glargine or insulin detemir) are less likely to cause hypoglycemia than with more conventional twice daily insulin regimens, and have been recommended.[6] Fasting at Ramadan may also be successfully accomplished in people with T1DM if they are fully educated and comfortable with the use of insulin pump and are otherwise metabolically stable. Most will need to reduce their basal infusion rate while increasing the bolus doses to cover the Sehri and Iftar.[1]

Recommendations for adolescents with T1DM on basal–bolus insulin

i. Reduction of basal insulin (e.g., glargine) by 10–20% and further if needed.
ii. To take rapid-acting analog (e.g., aspart) with meal.
iii. If glucose rises above 15 mmol/L, a correcting dose of rapid-acting insulin should be given.
iv. To use carbohydrate counting for meals to match the insulin dose.
v. If long- and rapid-acting insulin analogs are unavailable, it may be sufficient to use intermediate and short-acting insulin instead.[2]

Two-dose insulin regimen

Majority of children and adolescents with diabetes in developing countries are from poor socioeconomic background and the conventional twice daily insulin regimen is most suitable for them. They are advised to change their dosage such that they take combined short- and intermediate-acting insulin before Iftar, which is their

usual morning dose and only short-acting insulin before Sehri at a dose of 0.1–0.2 U/kg.[3]

Three-dose insulin regimen

Two doses before Sehri and Iftar of short- acting insulin and one dose in the late evening of intermediate-acting insulin.

Frequent home blood glucose monitoring should be performed, especially before Iftar and 3 h afterwards and before and 2 h after the Sehri to adjust the insulin dose and prevent any hypoglycemia and postprandial hyperglycemia following overeating.

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