

Should Type 1 diabetics fast in Ramadan

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Abstract

Fasting during the holy month of Ramadan is obligatory for all healthy adult and adolescent Muslims from the age of 12 years. This involves abstaining from eating or drinking from early dawn (Suhur/Sehri) till sunset (Iftar). Fasting is not meant to create excessive hardships or impart any adverse effect to the Muslim individual. As such, Islam has exempted certain categories of people from fasting including young children, travelers, the sick, the elderly, and pregnant and lactating women. According to expert opinion, people with type 1 diabetes who fast during Ramadan are at very high risk of metabolic deterioration. However, some recent studies have demonstrated that individuals with type 1 diabetes who are otherwise healthy and stable, can fast during Ramadan provided they comply with the Ramadan focused management plan and are under close professional supervision. This article discusses how to assess, counsel, monitor and manage people with type 1 diabetes who wish to fast during Ramadan.

Keywords: Ramadan, fasting, Type 1 diabetes.

Introduction

Fasting during the holy month of Ramadan, one of the five pillars of Islam, is obligatory for all healthy adult and adolescent Muslims from the age of 12 years. The month has huge spiritual implications and is an opportunity to purify ourselves. Along with refraining from all sorts of sins and misdeeds, one has to abstain from eating or drinking from early dawn (Suhur/Sehri) till sunset (Iftar) each day—approximately 11–20 hours, depending on the geographic location and season for 28–30 days. The large population based EPIDIAR (Epidemiology of Diabetes and Ramadan) study conducted among 12,243 people with diabetes from 13 Islamic countries reported that, 42.8% of type 1 and 78.7% of type 2 diabetics fasted for at least 15 days during the month of Ramadan.¹ Fasting is not meant to create excessive hardship or impart any adverse affect to the Muslim individual and as such Islam has exempted certain categories of people from fasting,

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including young children, travelers, the sick, the elderly, pregnant and lactating women. Many patients with diabetes, specially many of the type 1 diabetics might fall into these categories. Nevertheless, many patients with type 1 diabetes (T1DM) insist on fasting during Ramadan, thereby creating a challenge for themselves and their health care providers. This article discusses how to assess, counsel, monitor and manage people with type 1 diabetes who wish to fast during Ramadan.

Risks associated with fasting in patients with diabetes

The extensive EPIDIAR study showed 4.7-fold increased risk of severe hypoglycaemia and an approximate 3 fold increase in the incidence of severe hyperglycaemia with or without ketoacidosis in patients with type 1 diabetes during the month of Ramadan.¹ Table-1 shows major risks associated with fasting in patients with diabetes.

Table-1: Major risks associated with fasting in patients with diabetes.

Hypoglycaemia
Hyperglycaemia
Diabetic Ketoacidosis
Dehydration and thrombosis

Risk stratification

Physicians working in Muslim countries commonly face difficulty in advising people with diabetes on the safety of fasting. According to expert guideline following are the patients who are in very high risk group and high risk group who fast during Ramadan:^{2,3}

Very high risk group:

- Severe hypoglycaemia within the three months prior to Ramadan
- A history of recurrent hypoglycaemia
- Hypoglycaemia unawareness
- Sustained poor glycaemic control
- Ketoacidosis within the 3 months prior to Ramadan
- Type 1 diabetes mellitus
- Acute illness
- Hyperosmolar hyperglycaemic coma within the previous 3 months
- Performing intense physical labour
- Pregnancy
- Chronic dialysis

High risk group:

- Moderate hyperglycaemia
- Renal insufficiency
- Advanced macrovascular complications
- Patient living alone and treated with insulin
- Aged people with ill health

Patients receiving treatment with drugs that may affect mentation

Fasting is a spiritual issue for which patients make their own decision after receiving appropriate advice from religious teachings and from health care providers but it has been emphasized that all brittle type 1 diabetic patients should be strongly advised not to fast. Fasting at Ramadan carries a very high risk of adverse effect for people with type1 diabetes. This is further exacerbated if they have any of the above mentioned risk factors. In addition, the risk is also very high in patients who have limited access to medical supervision and those who do not comply with medical advice.

Can people with type 1 diabetes fast during Ramadan?

Many people with type 1 diabetes wish to observe fasts in Ramadan. The potential risks and the risk stratification in diabetic patients who fast during Ramadan have already been described. During the past few decades, there have

Table-3: Very high risk Type 1 diabetics, who should be discouraged to fast.

All brittle type 1 diabetics
Poorly controlled type 1 diabetics
Patients not complying with diabetic regimens for diet, drug, daily activity and blood glucose monitoring
Type 1 diabetics with serious complications
Patient with severe hypoglycaemia within the three months prior to Ramadan
A history of recurrent hypoglycaemia
Hypoglycaemia unawareness
Ketoacidosis within the 3 months prior to Ramadan
Patients with a history of two or more episodes of hypoglycaemia and/or hyperglycaemia during Ramadan
Pregnant diabetics
Elderly patients with any degree of alertness problems

been studies on Ramadan fasting in patients with type 1 diabetes. Some recent studies have demonstrated that with proper education, appropriate adjustment of insulin, diet and daily activities, type 1 diabetes patients, including adolescents with type 1 diabetes, can fast during Ramadan, provided they do regular self-monitoring and are under close professional supervision.⁴⁻¹⁰ This is only applicable to patients who are otherwise healthy and stable. In most of those studies, there were no significant short term parameter changes (eg. body weight, HbA1c, fasting lipid profile) and major complications like severe hypoglycaemia, DKA. The Clinical trials of Ramadan fasting in patients with type 1

Table-2: Clinical trials of Ramadan fasting in patients with type1 diabetes.

Authors/year/ study design	No. of patients	Mean age (Range)	Duration of fasting	Insulin type
Zabeen et al, ⁴ 2014 Prospective, observational	33	13.5 (11-18) year	Full month (20 patients)	Insulin type Conventional twice daily regimen with actrapid and insulatard
Al-Khawari et al, ⁵ 2010 Prospective, observational	22	13.9 (9-18) year	>13 days(18 patients)	Glargine and Aspart vs intermediate and short acting insulin
AlAlwan et al, ⁶ 2010 Prospective, case control	20 (12 in fasting group, 8 in non fasting group)	12.4 (8-14) year	Full month (all patients, except 1)	Multiple daily insulin injections
Khairullah et al, ⁷ 2008 Prospective Observational	9	NA	Full month	Glargine and lispro or aspart (6:4 ratio)
Kassem et al, ⁸ 2005 Prospective, Observational	17	18.8	Full month	Ultralente and regular(7:3 ratio)
Kadiri et al, ⁹ 2001 Open label,crossover,comparative	64	31.8	2 wk	NPH and lispro vs NPH and regular
Salman et al, ¹⁰ 1992 Obsevatlional	21	11.5 (9-14) year	7 days to full month	Actrapid and NPH

NA=not available.

diabetes are described in brief in Table-2. Table-3 provides pragmatic guidance as to how risk stratification can be done in people with type 1 diabetes.

Type 1 diabetics who wish to fast during Ramadan and do not have the aforementioned criteria, who are otherwise healthy and stable, comply well with medical advice and under close medical supervision can be allowed to fast.

Recommendations

Health care providers commonly face the difficulty in advising patients with diabetes on dietary, drug regimens and overall care during the month of Ramadan.

Following recommendations are made for type 1 diabetics who wish to fast during Ramadan:^{2,11}

A. Organizational issues:

The management of diabetes during Ramadan fasting should be considered well in advance of the holy month. Diabetes care providers should have comprehensive strategy as well as clear understanding of the religious ruling on fasting to give their advice with confidence. Leaflets, posters, booklets etc containing information and advice about Ramadan fasting should be available for patients well before the start of Ramadan.

B. Individualization:

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

C. Pre-Ramadan Medical Assessment:

This should be undertaken 1-2 months before the fasting month starts.

1. Physical status, weight, blood pressure, glycaemic and lipid control should be assessed.
3. Patient should be assessed for acute and chronic complications, and individual risk stratification should be done.

D. Ramadan focused Patient Education:

Patients with type 1 diabetes who are fit for fasting and wish to fast 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 hypoglycaemia, hyperglycaemia, dehydration and impending DKA.
3. Meal planning and dietary advice.

4. Timing and intensity of physical activity.

5. Adherence to therapy.

E. Diet and nutrition:

1. People should maintain a healthy and balanced diet during Ramadan. Ingestion of large amount of foods rich in carbohydrate and fat, specially during Iftar should be avoided.
2. Meal at Suhur should contain complex carbohydrate (eg. rice, chapati) that delays digestion and absorption which should be taken as late as possible.
3. Inclusion of fruits, vegetables, lentils, yogurt, whole cereal made food items.
4. Fluid intake (sugar free) should be increased at Iftar and during nonfasting hours.

F. Exercise and physical activity:

1. Normal level of physical activity should be maintained.
2. Rigorous exercise during fasting hours should be avoided.
3. Tarawih prayer can be considered as part of daily exercise programme.

G. Checking glycaemic status:

1. Checking blood glucose through finger prick does not invalidate fasting state. Frequent home blood glucose monitoring should be performed to adjust the insulin dose and prevent any hypoglycaemia and postprandial hyperglycaemia.
2. Urine should be checked for ketones if blood glucose is high (>270 mg/dl).

H. Breaking the fasting:

1. Patient should break the fast if blood sugar level is low (<less than 72 mg/dl) or patient experiences signs/symptoms of hypoglycaemia and if blood glucose level is >300 mg/dl.
2. Patient should avoid fasting on sick days.

I. Insulin regimens for Type 1 diabetic patients:

It is fundamental to adjust the insulin regimen for good glycaemic control during Ramadan fasting. Use of insulin lispro instead of soluble insulin as the short-acting component has shown to reduce hypoglycaemia and improve postprandial glycaemic excursions.⁹ Insulin aspart can also be recommended for this purpose. Use of long-acting synthetic analogue (e.g. insulin glargine or insulin

Table-4. Suggested changes to insulin regimen in patients with type 1 DM during Ramadan.

- ◆ Reduction of basal insulin (detemir or glargine) by 10-20% and further if needed. To take rapid acting analogue with meal. A correcting dose of rapid-acting insulin should be given if glucose rises above 270 mg/dl.⁵
- ◆ Evening insulin (before iftar) should comprise of combined short-acting and intermediate-acting insulin which is patient's usual morning dose. The intermediate-acting insulin at the time of the dawn meal (suhur) can either be omitted or reduced by 50%. The short acting insulin is taken alone.^{10,12}
- ◆ Usual morning dose of combined short and intermediate-acting insulin should be taken before iftar and usual evening dose of combined short and intermediate-acting insulin taken at the time of Suhur.⁴
- ◆ 70% of the pre-Ramadan insulin dose may be divided as follows: 60% as 1 daily injection of Glargine in the evening and 40% as ultra short acting insulin (aspart or lispro) given in 2 doses, 1 at Suhur and 1 at Iftar. Regular insulin should be used at iftar instead of ultra-short acting insulin if a snack is to be taken in the hours after the sunset meal.⁷
- ◆ 85% of the pre-Ramadan dose may be divided as 70% ultralente and 30% regular insulin, both given in 2 doses, 1 at Suhur and 1 at Iftar.⁸

detemir), in basal-bolus regimen has been recommended as they are less likely to cause hypoglycaemia.² Fasting at Ramadan may also be successfully accomplished in people with Type1 diabetes if they are fully educated and familiar with the use of insulin pump and are otherwise metabolically stable and free from any acute illness. Most will need to reduce their basal infusion rate while increasing the bolus doses to cover the predawn and sunset meals.² Following insulin therapy methods have been studied successfully (Table-4):

Novel Insulin Therapy

Insulin degludec has recently been introduced in many Islamic countries, including Bangladesh and India. It is an ultra long acting basal insulin used in adults with type1 or type 2 diabetes and has shown to reduce nocturnal hypoglycaemia in adult type 1 diabetics.¹³ To know whether Insulin degludec and insulin deglutec aspart are potentially safe options for use in adult type 1 diabetics who wish to observe Ramadan fast needs further studies.

Conclusion

It is crucial that a patient's decision to fast be made after thorough consultation and assessment by the physician concerning the risks involved. According to expert

opinion, type 1 diabetics who fast during Ramadan are at very high risk of metabolic deterioration. However, some recent studies have demonstrated that type 1 diabetics who are otherwise healthy and stable, can fast during Ramadan provided they comply with the Ramadan focused management plan and are under close professional supervision. The strategies to ensure safety of type1diabetics who are planning to fast include: 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.

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