

# Review Article

## Ramadan and Diabetes

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### Abstract

*During Ramadan, Muslims fast from dawn to dusk for one lunar month. Although a majority of Muslim patients with type 2 diabetes fast during the month of Ramadan, there are no accepted guidelines for its management during this period. The few studies on this subject suggest that there are important alterations in energy intake and physical activity, and that most patients change their pattern of drug intake. The objectives of this article is to assist in the task of advising diabetic patients who fast and provide them with guidelines regarding proper management of their diabetes during Ramadan.*

**Key words:** Ramadan Diabetes, Muslim, Management, Drugs, Font.

### Introduction

Ramadan is a religious fast between sunrise and sunset for one lunar month each year. During this period adult Muslims are required to abstain from foods, water, beverages, oral drugs and sexual intercourse. All healthy Muslims are obliged to fast during Ramadan. Although Islam exempts persons who are sick from fasting, different international consensus meeting to establish guidelines suggested that patients with stable type 2 diabetes mellitus without progressive co-morbid pathology, under treatment with sulphonylureas could safely undertake the fast<sup>1</sup>. Nevertheless, many Muslims with diabetes choose to fast during Ramadan. The population-based epidemiological study, Epidemiology of Diabetes and Ramadan (EPIDIAR), showed that 43% of patients with Type 1 diabetes and 79% of patients with Type 2 diabetes reported fasting in 13 Islamic countries during Ramadan<sup>2</sup>.

It is essential to develop a guideline for the people fasting with diabetes mellitus. The first international attempt to develop guidelines for the fasting diabetic patients during Ramadan was made at a consensus

meeting held in Casablanca, Morocco in January 1995<sup>1</sup>. Different guidelines recommended about various matters, but almost all of them covered following issues: (1) The psychological aspects of Ramadan fasting, (2) diabetic subjects who should fast, (3) diabetic subjects who should not fast, (4) glucose monitoring before, during and after Ramadan, (5) patient education before Ramadan, (6) therapeutic considerations, (7) research needs, and (8) methodological aspects of research in Ramadan<sup>2,3,4</sup>. This article tries to develop a common recommendation for the people fasting during Ramadan with diabetes mellitus after reviewing different articles published in renowned journals.

### Risks associated with fasting

There are various risks for diabetic patients fasting during Ramadan<sup>2,3</sup> and they are:

- Hypoglycemia
- Hyperglycemia or Hyperosmolar Hyperglycemia State (HHS)
- Diabetic Ketoacidosis (DKA)
- Dehydration and thrombosis

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But these risk factors are not true for all patients. Some diabetic patients are more vulnerable than others. For type 1 diabetes, it was recommended in different literatures that no patient should fast. However, if patients did insist in fasting against medical advice, a list of absolute contra-indications was identified (e.g. recent ketoacidosis). All patients with type 1 diabetes should not fast because of this vulnerability<sup>3</sup>. However, if a patient insists against medical advice, we can consider the following:

**Absolute contra-indications:**

- Brittle diabetes mellitus (DM)
- Patients on insulin pump
- Patients on multiple insulin injections per day
- Ketoacidosis or severe hypoglycemia in the last 3 months before Ramadan
- People living alone
- Advanced micro- or macro-vascular complications

**Relative contra-indications (fast with risk):**

- Well controlled type1 DM
- No diabetes ketoacidosis (DKA)
- No recent hypoglycemia
- Not more than 2 injections per day

For type 2 diabetes, contra-indications to fasting identified fell into several categories. These included diabetes-related complications (e.g. nephropathy), co-morbid pathologies which are contra-indications to fasting (such as uncontrolled infections), pregnancy, lactation, and multiple insulin dosing. It was felt that a specific category of contra-indications for the elderly was not required, since the majority of elderly patients who would be at risk from fasting would be so because of some other medical contr-aindications<sup>2,3</sup>. Patients with one or more of the followings are advised not to fast.

**Conditions related to diabetes:**

- Nephropathy with serum creatinine more than 1.5 mg/dL
- Severe retinopathy
- Autonomic neuropathy: gastroparesis, postural hypotension
- Hypoglycemia unawareness
- Major macrovascular complications: coronary and cerebrovascular
- Recent Hyperglycemic hyperosmolar State (HHS)

- or Diabetic ketoacidosis (DKA )
- Poorly controlled diabetes (Mean Random Blood Glucose (BG) > 300mg/dl)
- Multiple insulin injections per day

**Physiological conditions:**

- Pregnancy
- Lactation

**Co-existing major medical conditions such as:**

- Acute peptic ulcer
- Pulmonary tuberculosis and uncontrolled infections
- Severe bronchial asthma
- People prone to urinary stones formation with frequent urinary tract infections
- Cancer
- Overt cardiovascular diseases (recent MI, unstable angina)
- Severe psychiatric conditions
- Hepatic dysfunction (liver enzymes > 2 x ULN) [Upper limit of normal ]

**Management of Diabetes during Ramadan**

Management during month of Ramadan is different. Several factors should be kept in mind during treatment. At first, we should start by identifying patients with either Type I or Type II DM who are at risk of developing complications by fasting<sup>3,4,5,6</sup>.

**Table no.1:** Risk assessment.

VeryHigh Risk	High Risk	Moderate Risk
Severe hypoglycemia during the three months prior to Ramadan DKA within three months prior to Ramadan	Patients with moderate hyperglycemia patients with renal insufficiency	Well controlled patients on short acting insulin secretagogues such as Repiglinide or Nateglinide
HONK within three months prior to Ramadan	People living alone treated with insulin or sulphonylurea	
Type 1DM Patients with a history of recurrent hypoglycemia	Old age with ill health Drugs that may affect mentation	
Poor glyceimic control	Patients with co-morbid conditions that may present additional risk	
Acute illness		
Pregnancy		
Chronic dialysis		
Patients who perform intense physical labor		

**Life style recommendations:**

Special precautions are recommended to avoid hypoglycemia events:

- To take Sahur (morning meal) close to last time of Sahur.

- To change in the schedule, amount and composition of meals.
- To reduce physical activities during the day. However, physical exercises can be performed about one hour after Iftar (evening meal).
- To keep the same diet during Ramadan as before<sup>2,3</sup>.

**Therapeutic prescriptions:**

- Understanding and compliance with treatment is crucial for patients receiving Oral Antidiabetic Drugs (OAD) once daily<sup>2,7</sup>.
- To administer the OAD at breaking of fasting time for patients receiving divided doses of OAD<sup>7</sup>.
- To administer the higher dose of OAD before breaking of fasting and the lower dose at sahur time. It is recommended to administer half the pre-Ramadan lower dose initially to avoid hypoglycemia<sup>2,8,9</sup>.
- For type 2 diabetic patients treated with insulin to use intermediate acting insulin which, must be administrated at the breaking of fasting table 2<sup>2,8,9</sup>.

**Monitoring during Ramadan**

Patients should monitor their blood glucose even during the fast to recognize subclinical hypo and hyperglycemia<sup>2,3</sup>.

- 2 hours post sahur and one hour pre iftar are likely to pick subclinical hypoglycemia.
- 1-2 hours post iftar is likely to pick subclinical hyperglycemia.
- If blood glucose is noted to be low, the fast must be broken.
- If blood glucose is noted to be >300 mg/dL, ketones in urine should be checked and medical advice sought.

**Education of diabetic patients and of their families:**

- **Must focus on:**  
The situations contra-indicating fasting.  
Treatment of diabetics and its modifications.  
Importance and tools of medical monitoring and self-monitoring.
- **Must insist on:**  
The risks of acute complication and means to prevent them.  
Generalization of information on the problem of diabetes and Ramadan.
- **Must be performed by:**  
Nurses, patient associations and concerned authorities.

**Must be achieved:**

Before Ramadan using various methods (individual or group education, meetings for public information, document, audiovisual media, Friday prayers).

**Breaking the Fast:**

Patients should end their fast if

- Blood glucose is <60mg/dL (3.3 mmol/L)
- If the sugar is <70 mg/dL (3.9 mmol/L) in first few hours after Sahur and the patient has taken insulin or sulphonylurea at Sahur
- If blood sugar is greater than 300 mg/dL (16.7 mmol/L) and patient is very much symptomatic

**Table 2 :** Changes of diabetes management during Ramadan.

Before Ramadan	During Ramadan
Patients on diet and exercise control	No change needed (modify time and intensity of exercise), ensure adequate fluid intake
Patients on oral hypoglycemic agents	Ensure adequate fluid intake
Biguanide, metformin 500 mg three times a day, or sustained release metformin	Metformin, 1,000 mg at the sunset meal (iftar), 500 mg at the predawn meal (Suhur)
Sulfonylureas once a day, e.g., gliclazide MR, glimepiride	Dose should be given before the sunset meal (iftar); adjust the dose based on the glycemic control and the risk of hypoglycemia
Sulfonylureas twice a day, e.g., glibenclamide 5 mg or gliclazide 80 mg, twice a day (morning and evening)	Use half of the usual evening dose at the predawn meal (Suhur) and the full morning dose at the sunset meal (iftar), e.g., glibenclamide 2.5 mg or gliclazide 40 mg in the morning, glibenclamide 5 mg or gliclazide 80 mg in evening.
Repaglinide	Should be used as usual (ie take tablet only if meal is taken) in usual dose.
Thiazolidinedione	No change needed
Patients on insulin	Ensure adequate fluid intake in all cases
70/30 premixed insulin twice daily, e.g., 30 units in morning and 20 units in evening	Use the usual morning dose at the sunset meal (iftar) and half of the usual evening dose at predawn (Suhur). e.g., 70/30 premixed insulin, 30 units in evening and 10 units in morning; also consider changing to insulin analogue.

**Conclusion**

These recommendations were established based on the little scientific knowledge available on fasting in Ramadan, and is the responsibility of physicians to apply their knowledge at their discretion. But it is high time to develop a proper guideline especially for Bangladeshi diabetic patient who are fasting during Ramadan.

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