Ramadan fasting in diabetic patients: When is fasting not advisable in a person with diabetes?

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Abstract

Ramadan Fasting is one of the five pillars of Islam, but there is a clear exemption in holy Qur'an for those who are temporarily or permanently ill. Diabetes Mellitus is one of the most prevalent chronic illnesses globally; it is associated with metabolic risks that might be augmented with fasting. In spite of this risk many Muslims prefer to fast considering not fasting is a great sin and shameful. Defining the situations when fasting is not advisable in a diabetic patient is an important issue which has to be clearly determined on bases of solid evidence whenever possible. The recommendations have to be agreed between experts of physicians and Islamic Religion scientists. The advances in diabetes management necessitate continuous updating of the recommendations to match with Islamic legitimacy. The role of healthcare providers is neither recommending nor preventing a patient from fasting, their role is just to explore risks and provide medical advice for safe fasting. This review summarizes previous trials for risk stratifications and recommendations for fasting in diabetic patients.

Keywords: Ramadan, Fasting, Diabetes Mellitus.

Introduction

Fasting is a spiritual issue, for which people have to make their own decision. Understanding that, expert healthcare providers feel that their role is neither recommending nor preventing a patient from fasting. Their role is just to explore risks and provide medical advice for safe fasting. Playing this role has to be clearly built on bases of solid evidence whenever possible. Gaps in the evidence should be filled by well designed controlled clinical studies. This advice is extremely important and very special. So it has to be agreed between experts of physicians and Islamic Religion scientists and it has to be educated widely to physicians involved in treating Muslim patients, Muslim Religion scientists (Mufty) and to the whole Muslim community.

An estimated 1.6 billion person around the world are Muslims, making Islam the world's second-largest religious tradition after Christianity, according to the December 2012 Global Religious Landscape report from the Pew Research Center's Forum on Religion and Public Life.[1] Nearly two-thirds (62%) of Muslims live in the Asia-Pacific region. However, the Middle East-North Africa (MENA) region has the highest concentration Muslims of any region of the world: 93% of its approximately 341 million inhabitants are Muslim, compared with 30% in sub-Saharan Africa and 24% in the Asia-Pacific region.

Long term fasting period is expected to produce metabolic changes. It lowers blood glucose and Insulin level and increases the glucagon and catecholamine concentrations. This causes glycogenolysis, gluconeogenesis, and fatty acid oxidation. Fasting can potentially lead to several adverse outcomes, including hypoglycaemia, hyperglycaemia, ketogenesis, and hypovolaemia. However studies on Islamic fasting revealed that by the end of Ramadan, fasting caused significant body weight decrease and small but significant blood glucose increase (after initial decrease). Male reproductive hormones, hypothalamic-pituitary-thyroid axis or peripheral metabolism of thyroid hormones did not show any significant change.[2,3]

When should a Muslim not fast in Islamic Religion?

Ramadan fasting is one of the five pillars in Islam. It is obligatory for all healthy Muslim adults.[4] Majority of Muslims across the world fast with true faith and complete dedication as long as they tolerate fasting. Islamic fast means avoidance of any food or drink from dawn to sunset while feeding is allowed from sunset to next dawn. The duration of day fasting varies according to the geographic location, being longest in summer in regions far from the equator (may reach 18 hours). Islamic year is a lunar one, therefore, Ramadan month starts about 10 days earlier every year. Before about one and half thousand years and long before the physiology of fasting was defined, the Qur'an was clear regarding those who should not fast during Ramadan:

"Therefore, whoever of you is present (at his home) during the month, he shall fast therein, and whoever is sick or on a journey, he shall then (fast) the same number of other days"[4]

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In addition to sick people and travelers, children below 12 and women who are menstruating or nursing a baby are exempt from fasting according to Islamic Laws. Fasting is a divine duty for the safe and sound persons while, in the same manner, not fasting is also a divine command for the sick, passengers and other defined cases (with their proper conditions). Qur'an pays attention to the philosophy of the divine legislation of fasting at the end of the verse, and says:

"Allah desires ease for you, and He does not desire hardship for you"[4]

Real life

In real life many Muslims who are exempt insist to fast even when they are sick and even against the advice of their treating physicians thinking that not to fast be a very disgraceful action, a sin and shameful among a society used to living in a special religious spiritual atmosphere during Ramadan. Diabetic patients are not exceptions. The Epidemiology of Diabetes and Ramadan (EPIDIAR) study included 12914 Muslim diabetic patients in 13 countries, who responded to the questionnaire of the study.[5] Among those patients, 42% of type 1 diabetics and 78.7% of type 2 diabetics reported fasting at least 15 days during Ramadan.

Diabetes Mellitus is a chronic illness with a very high prevalence globally. According to IDF Atlas 6,[6] the global prevalence was 8.3% in 2013, prevalence in MENA region, where 93% of population are Muslims, was the highest over the world (10.9%) while in South Eastern Asia (SEA region) was 8.7%. It was estimated that more than 50 million diabetic Muslims all over the world are eligible for fasting in Ramadan annually.

Continuous education and support is essential for all diabetic patients, nevertheless, it seems of particular importance for Muslim patients wishing to fast thereby creating a medical challenge for themselves and their health care providers. It is increasingly important that medical professionals be aware of potential risks associated with fasting during Ramadan and with approaches to mitigate those risks.

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.[7] The Casablanca conference brought together both religious and medical opinion leaders from throughout the Muslim World to discuss how to bring together religious and medical teachings in the best interests of the well-being of Muslim diabetics wishing to fast. However, updates are continuously required with the development of newer strategies for patients' monitoring, appearance of new drugs and the promising results of structured patients' education trials.[8]

In 2001, the 'Diabetes and Ramadan 'Advisory Board, a group of international experts, met in Paris to revisit the Casablanca consensus and other recommendations and take some actions to gather more information about diabetes and its management during this fasting period. Therefore a large epidemiological survey called the EPIDIAR study was initiated.[5] The objective of the EPIDIAR study was thus to generate data on patient care during Ramadan across different countries with Muslim population, and to identify the impact of Ramadan and fasting on patient's health. The study aimed to collect data on 1000 patients per country with 12,914 patients included overall. It clearly demonstrates that fasting during Ramadan is not without hazard to the health of patients with diabetes and it might be interesting to determine the profile of these patients at risk.

Diabetes and Ramadan Advisory Board met again in Beirut in January 2003, and decided to build on existing guidelines and new data to create a comprehensive set for recommendations for diabetic patients in Ramadan. For the criteria warning of fasting, it was suggested to identify a list of contraindications for fasting, which would use precise medical terminology including cut-off values for quantitative variables. It was published in Clinical Diabetes 2004.[9] These contra-indications are listed in Box-1.

In view of the results of the EPIDIAR study, recommendations for management of diabetes during Ramadan were published in Diabetes care, 2005.[10] They avoided the use of the terms "indications" or "contraindications" taking in consideration that fasting is a religious issue for which patients make their own decision after receiving appropriate advice from religious authorities and from their own health care providers. Therefore, they highlight the potential risks as well as provide suggestions on how to manage the patients with diabetes who decide to fast in Ramadan. They categorize risks in patients with type 1 or type 2 diabetes who fast during Ramadan as in Box-2.

In 2010 these recommendations were updated again.[11] They aimed to put an answer about some questions including the voluntary1- to 2-day fasts per week, effect of prolonged fasting (more than 18 hours a day) in regions far from the equator during Ramadan when it occurs in summer. The update included the exploration of the effect of structured education and support for safe fasting, In addition to the role of new medications, such as

Box-1: Contraindications to fasting (Diabetes and Ramadan Advisory Board, Beirut, 2003).

A- All patients with type 1 diabetes should not fast. However, if a patient insists against medical advice, please consider the following:

Absolute contra-indications:
- Brittle DM (as defined by the American Diabetes Association)
- Patients on insulin pump
- Patients on multiple insulin injections per day
- Ketoacidosis or severe hypoglycaemia 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 patients
- No diabetes keto-acidosis (DKA)
- No recent hypoglycaemia
- Not more than 2 injections per day.

B- Guidelines for patients with type 2 diabetes:
Patients with one or more of the following 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
- Hypoglycaemia unawareness
- Major macrovascular complications: coronary and cerebrovascular
- Recent hyperosmolar state or DKA
- Poorly controlled diabetes (Mean Random BG > 300)
- 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

the incretin-based therapies- with less risk for hypoglycaemia.

As regard categories of risk in diabetic patients who fast in Ramadan; very high risk and high risk were not changed in the update, Moderate and low risk were modified as in Box-3.

It should be noted that their classification is based largely on expert opinion and not on scientific data derived from clinical studies.

Box-2: Rist stratification in Diabetes (2005).

A- Very high risk
Severe hypoglycaemia within the last 3 months prior to Ramadan
Patient with a history of recurrent hypoglycaemia
Patients with hypoglycaemia unawareness
Patients with sustained poor glycaemic control
Ketoacidosis within the last 3 months prior to Ramadan
Type 1 diabetes
Acute illness
Hyperosmolar hyperglycaemic coma within the previous 3 months
Patients who perform intense physical labour
Pregnancy
Patients on chronic dialysis

B- High risk
Patients with moderate hyperglycaemia (average blood glucose between 150 and 300 mg/dl, A1C 7.5-9.0%)
Patients with renal insufficiency
Patients with advanced macrovascular complications
People living alone who are treated with insulin or sulfonylureas
Patients with comorbid conditions that present additional risk factors
Old age with ill health
Drugs that may affect mentation

C- Moderate risk
Well-controlled patients treated with short-acting insulin secretagogues such as repaglinide or nateglinide

D- Low risk
Well-controlled patients treated with diet alone, metformin, or a thiazolidinedione who are otherwise healthy.

Box-3: Update to Risk Stratification (2010).

E- Moderate risk
Well-controlled diabetes treated with short-acting insulin secretagogues

F- Low risk
Well-controlled diabetes treated with lifestyle therapy, metformin, acarbose, thiazolidinediones, and/or incretin-based therapies in otherwise healthy patients.

A group of co-workers at University Diabetes Center, King Saud University had developed a PRE- approach (Presentation, Risk stratification and Education) model for diabetic Muslims who wish to fast in Ramadan.[12] For establishment of this model, they included 35 publications about diabetes mellitus and Ramadan fasting; they reviewed the data and the extracted findings were statistically analyzed. A clinical care pathway was developed which combines both the assessment and management aspects and consists of three steps termed

Box-4: Pre Approach (2014).

◆ **Presentation:** In the first step the patient must contact the physicians and / or health care provider two months prior to Ramadan. Based on the clinical history, lab investigations and overall health status, patients must be categorized under the risk stratification of diabetic patient who wish to fast during Ramadan.

◆ **Risk Stratification:**

Low risk: Diabetic patients whose fasting blood glucose and HbA1c is well controlled on diet alone or with metformin, Dpp4 inhibitor, or TZD who are otherwise healthy.

Moderate risk: Well controlled patients on short acting secretagogue, sulphonylurea, insulin, or taking combination oral or oral plus insulin.

High Risk: Severe and recurrent episodes of hypoglycaemia unawareness poor glycaemic control, ketoacidosis in the three months before Ramadan, hyperosmolar hyperglycaemia, unconsciousness within the three months before Ramadan, acute illness, intense physical labour, pregnant women, comorbidities such as advanced macro-vascular complications, renal disease on dialysis, cognitive dysfunction, uncontrolled epilepsy.

◆ **Education:** focused on the importance of patient's education concerning fasting during the holy month of Ramadan. Physicians must inform the patient about the complications of diabetes during fasting, and based on the clinical history, lab reports, and overall status of diabetic patients, counsel the patient either to fast or not. Here the significance of education of patients is vital and is the cornerstone of safe fasting.

as **PRE approach** (**P**resentation, **R**isk stratification, **E**ducation: Ramadan focused approach) (Box-4).

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