Ramadan Fasting amid Covid-19 Pandemic:

A Scientific, Jurisprudence, and Policy-making Approach

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Outline

- The Ritual of Fasting in Islam and Other Religions
- Health Benefits of Intermittent Fasting
- Health Risk associated with Ramadan Fasting
- Diabetes and Ramadan Fasting
- Covid-19 Pandemic and Ramadan Fasting
- Covid-19 Control in Iran
- Conclusions
History of Fasting

- Fasting was practiced in different religions before Islam.

- The fast of Yom Kippur is observed in Judaism and include more than 24 hours abstinence from food and drink.

- In the Bible, it is mentioned that Jesus was sent to the desert by the “Spirit” and fasted for 40 days and 40 nights.

Fasting in Islam

• Fasting is amongst main pillars of Islam

• Every year, 2 Billion Muslims fast during Ramadan

• There are exemptions in Ramadan Fasting and those at risk of health issues should not fast
Scientific evidence on Fasting

• Today, there is abundant evidence indicating that the health benefits of intermittent fasting are ample and very diverse.

• Nonetheless, a substantial portion of such evidence has emerged for in-vitro and animal studies.

• Moreover, an overwhelming proportion of studies on intermittent fasting have investigated only calorie-restriction, but not simultaneous thirst, dehydration, alternations in sleep pattern, psychosomatic changes, and possible spiritual effects.

• Therefore, there is a great need for extensive future research into the effects of Ramadan Fasting in humans.

Larijani B et al. Can Health Benefits of Intermittent Fasting be Generalized to Ramadan Fasting? A Letter to the Editor, pending publication
Cellular Mechanisms of Intermittent Fasting

- It was previously believed that reduction in free radicals is the only mechanism.

- Today, we know that fasting can activate adaptive cellular responses such as:
  - Increases resistance to stress
  - Improvement of glucose regulation
  - Suppression of inflammatory reactions

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Therapeutic Effects of Intermittent Fasting

- Fasting may produce therapeutic effects in some noncommunicable disorders such as:
  - Obesity
  - Diabetes
  - Cardiovascular disease
  - Cancers
  - Neurodegenerative diseases

- Findings of several studies have suggested that fasting may play a protective role against aging

Intermittent Fasting and Cognitive Functions

• There is evidence suggesting that fasting can enhance cognitive functions in terms of
  - Spatial memory
  - Associative memory
  - Working memory

• Fasting can also reverse neurotoxic effects of obesity, diabetes, and neuroinflammation in animal models

• Fasting can heal cognitive damages in traumatic brain injury

Intermittent Fasting and Malignancies

• Fasting can prevent from different malignancies and facilitates their cure through several mechanisms, including:
  - Decreasing the rate of spontaneous tumors
  - Suppressing growth of malignant tumors
  - Increasing sensitivity of different tumors to chemotherapy and radiotherapy

Intermittent Fasting and Cardiometabolic Risks

• Fasting improves several cardiometabolic risk factors in nonobese humans by means of:
  
  - Modification of blood pressure
  - Adjustment of resting heart rate
  - Balancing levels of high-density and low-density (HDL and LDL) cholesterol
  - Decreasing triglycerides levels
  - Regulating glucose and insulin concentration
  - Decreasing insulin resistance

Interruption Fasting and Neurologic Disorders

- It is documented that excessive calorie intake can increase the risks of:
  - Stroke
  - Alzheimer’s disease
  - Parkinson’s disease

- Fasting can delay or even reverse development and progress of such neurological defects through:
  - Strengthening mitochondrial function
  - Stimulation of autophagy
  - Increasing production of neurotrophic-factor
  - Activation of antioxidant defense mechanisms
  - Acceleration of DNA repair processes

Intermittent Fasting and Ramadan Fasting

• There exists a considerable body of literature on the subject of fasting, but they cannot be directly generalized to Ramadan Fasting for the following reasons:

  - The previous studies were mainly animal studies
  - Most studies have reported the benefits of only calory restriction.
  - Dehydration has not been taken into consideration in most studies
  - There is no evidence regarding the effects dryness of the mucosa and the risk of respiratory infections.

**Larijani B et al.** Can Health Benefits of Intermittent Fasting be Generalized to Ramadan Fasting? A Letter to the Editor, pending publication
Ramadan Fasting and Covid-19 Pandemic

• This year, millions of people have contracted COVID-19, hundreds of thousands have developed severe illness, and tens of thousands have died.

• Consequently, jurisprudence scholars, academics, and medical practitioners all seem unsure as to whether fasting might increase the risk of infection.

• Currently, there is not enough academic evidence in this regard.

Larijani B et al., Ramadan Fasting during Covid-19 Pandemic, in press
Existing Evidence on Ramadan Fasting during the Covid-19 Pandemic

• There is **no evidence** to suggest any adverse effect of Ramadan Fasting during the Covid-19 pandemic in **healthy individuals**

• However, people with Covid-19 or **any related symptom** should not fast

• Those fasting who **feel sick** should immediately stop fasting and ensure adequate hydration

• Patients who have **recovered from Covid-19** should not fast for at least several weeks.

British Islamic Medical Association, April 2020
Ramadan Fasting and Immunity

• There is no evidence linking Ramadan Fasting to any immunological malfunction

• There is evidence that Ramadan Fasting can strengthen the immune system against infections

• This effect can be attributed to:
  - Increased serum levels certain immunoglobulins such as IgA
  - Increased levels of some elements of the complement system (such as C4)

Effects of Ramadan Fasting on Sport Performance

- Ramadan Fasting can improve physical composition, function, and endurance.

- However, exercise should be planned for the beginning or end of the day.

Potential Adverse Effects of Ramadan Fasting

- There is some evidence that Ramadan Fasting can decrease IgG levels.

- In patients with diabetes, it is demonstrated that Ramadan Fasting can lead to an increased risk of infection.

- Some people argue that dry mouth and throat due to fasting may lead to increased risk of infection.

- Nonetheless, there exist no solid clinical evidence to indicate that immune system may be suppressed in fasting.

Ramadan Fasting and Diabetes during the Pandemic

- **Diabetes** is one of the most important comorbidities linked to the severity of Covid-19 and increases the risk of:
  - Adult Respiratory Distress Syndrome
  - Multi-organ failure

- **COVID-19** is associated with severe hyperglycemia particularly in the elderly with type 2 diabetes

- Therefore, according to scientific evidence, it seems logical that **patients with diabetes** should be somehow advised **against Ramadan Fasting during the current Covid-19 pandemic, particularly the elderly**

Stefan R Bornstein et al., Practical recommendations for the management of diabetes in patients with COVID-19, The Lancet Diabetes and Endocrinology, 23 April 2020
Anti-diabetics and Covid-19

- For management of patients with diabetes, most anti-diabetes drugs should be modified in the context of active Covid-19

Stefan R Bornstein et al., Practical recommendations for the management of diabetes in patients with COVID-19, The Lancet Diabetes and Endocrinology, 23 April 2020
Management of Metabolic Diseases in Patients with Covid-19

Consensus recommendations for COVID-19 and metabolic disease

<table>
<thead>
<tr>
<th>Out-patient care</th>
<th>In-patient or intensive care unit</th>
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<tbody>
<tr>
<td><strong>Prevention of infection in diabetes</strong></td>
<td><strong>Monitor for new onset diabetes in infected patients (in-patient care)</strong></td>
</tr>
<tr>
<td>• Sensitisation of patients with diabetes for the importance of optimal metabolic</td>
<td>• Management of infected patients with diabetes (intensive care unit)</td>
</tr>
<tr>
<td>control</td>
<td>• Plasma glucose monitoring, electrolytes, pH, blood ketones, or β-hydroxybutyrate</td>
</tr>
<tr>
<td>• Optimisation of current therapy if appropriate</td>
<td>• Liberal indication for early intravenous insulin therapy in severe courses (ARDS, hyperinflammation) for exact titration, avoiding variable subcutaneous resorption, and management of commonly seen very high insulin consumption</td>
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<tr>
<td>• Caution with premature discontinuation of established therapy</td>
<td></td>
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<tr>
<td>• Utilisation of Telemedicine and Connected Health models if possible to maintain</td>
<td></td>
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<tr>
<td>maximal self containment</td>
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**Therapeutic aims**

- Plasma glucose concentration: 4–8 mmol/L (72–144 mg/dL)*
- HbA₁c: †less than 53 mmol/mol (7%)  
- CGM/FGM targets  
  - TIR (3.9–10 mmol/L): more than 70% (>50% in frail and older people)  
  - Hypoglycaemia (<3.9 mmol/L): less than 4% (<1% in frail and older people)  
- Plasma glucose concentration: 4–10 mmol/L (72–180 mg/dL)*

Risks associated with Fasting in Diabetes

- Fasting during Ramadan for patients with diabetes is with higher risk of complications.

- Type 1 diabetic who are poorly controlled are at very high risk for developing severe hypoglycemia.

- Decisions about fasting in diabetic patients must be individualized according to the risks involved through consultation with the clinician in charge.

Risk Evaluation for Fasting

--The risk of complications should be evaluated for every individual patient according to a wide range of factors

--High-risk patients should not fast


<table>
<thead>
<tr>
<th>Very high risk</th>
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<tbody>
<tr>
<td>Severe hypoglycemia within the last 3 months prior to Ramadan</td>
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<tr>
<td>Patient with a history of recurrent hypoglycemia</td>
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<tr>
<td>Patients with hypoglycemia unawareness</td>
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<tr>
<td>Patients with sustained poor glycemic control</td>
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<tr>
<td>Ketoacidosis within the last 3 months prior to Ramadan</td>
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<tr>
<td>Type 1 diabetes</td>
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<tr>
<td>Acute illness</td>
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<tr>
<td>Hyperosmolar hyperglycemic coma within the previous 3 months</td>
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<td>Patients who perform intense physical labor</td>
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<td>Pregnancy</td>
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<td>Patients on chronic dialysis</td>
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<tr>
<th>High risk</th>
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<tr>
<td>Patients with moderate hyperglycemia (average blood glucose between 150 and 300 mg/dl, A1C 7.5–9.0%)</td>
</tr>
<tr>
<td>Patients with renal insufficiency</td>
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<tr>
<td>Patients with advanced macrovascular complications</td>
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<tr>
<td>People living alone that are treated with insulin or sulfonylureas</td>
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<tr>
<td>Patients living alone</td>
</tr>
<tr>
<td>Patients with comorbid conditions that present additional risk factors</td>
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<tr>
<td>Old age with ill health</td>
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<tr>
<td>Drugs that may affect mentation</td>
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<table>
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<tr>
<th>Moderate risk</th>
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<tbody>
<tr>
<td>Well-controlled patients treated with short-acting insulin secretagogues such as repaglinide or nateglinide</td>
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<tr>
<th>Low risk</th>
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<tr>
<td>Well-controlled patients treated with diet alone, metformin, or a thiazolidinedione who are otherwise healthy</td>
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</table>
WHO Recommendations for Fasting during the Present Pandemic

Safe Ramadan practices in the context of the COVID-19

Interim guidance
15 April 2020

Background

The holy month of Ramadan is marked by social and religious gatherings where Muslim families and friends unite to break their fast together, after sunset during iftar or before dawn before sahur. These gatherings often involve large numbers of people, posing a risk of transmission of COVID-19.

If cancelling social and religious gatherings, where possible, virtual alternatives using platforms such as television, radio, digital media should be encouraged. Special consideration should be given to vulnerable populations.

WHO Recommendations for this Ramadan

• Some of **WHO recommendations** for Ramadan Fasting during Covid-19 pandemic are:

  - **There is no evidence** that fasting increase risk of COVID-19 infection. Therefore, **healthy people can fast** during this Ramadan similar to previous years

  - **Physical distancing** should be strictly maintained in Ramadan
  - **Gathering of large numbers of people** associated with Ramadan activities should be avoided
  - **People who are feeling sick or have any symptoms of COVID-19** to avoid attending events
According to a declaration by the Iranian Academy of Medical Sciences:

- **Completely healthy people younger than 65** can fast (those without any adverse health condition)

- In those older than 65, the decision as to fasting should be individualized according to their health condition (and exposure to the virus)

- Patients with diabetes who are younger than 65 can only fast if their diabetes is perfectly controlled (with HbA1c <7) under supervision

- Those who have **contracted the disease** should refrain from fasting for **several weeks** after complete recovery
Current status of Covid-19 outbreak in Iran

- Up to 21 April 2020, Iran had reported 84,802 infections, 5,297 mortalities, and 60,965 recoveries from Covid-19
Figures of Active and Closed Covid-19 Cases in Iran

<table>
<thead>
<tr>
<th>ACTIVE CASES</th>
<th>CLOSED CASES</th>
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<tbody>
<tr>
<td><strong>18,540</strong></td>
<td><strong>66,262</strong></td>
</tr>
<tr>
<td>Currently Infected Patients</td>
<td>Cases which had an outcome:</td>
</tr>
<tr>
<td><strong>15,183</strong> (82%)</td>
<td><strong>60,965</strong> (92%)</td>
</tr>
<tr>
<td>in Mild Condition</td>
<td>Recovered / Discharged</td>
</tr>
<tr>
<td><strong>3,357</strong> (18%)</td>
<td><strong>5,297</strong> (8%)</td>
</tr>
<tr>
<td>Serious or Critical</td>
<td>Deaths</td>
</tr>
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Show Graph
Show Graph
Total Covid-19 Cases in Iran

![Graph showing the total number of Covid-19 cases in Iran over time.](image-url)
Daily New cases in Iran

Daily New Cases in Iran

Daily New Cases
Cases per Day
Data as of 0:00 GMT+0

Novel Coronavirus Daily Cases

Daily Cases
Total Deaths in Iran

![Graph showing total deaths in Iran over time.](image-url)
Figures of Daily Deaths in Iran

Daily Deaths

Deaths per Day
Data as of 0:00 GMT+0

Novel Coronavirus Daily Deaths

0 50 100 150 200
Feb 15 Feb 18 Feb 21 Feb 24 Feb 27 Mar 01 Mar 04 Mar 07 Mar 10 Mar 13 Mar 16 Mar 19 Mar 22 Mar 25 Mar 28 Mar 31 Apr 03 Apr 06 Apr 09 Apr 12 Apr 15 Apr 18 Apr 21

Daily Deaths
Major Domains of Action

In responding to the Covid-19 Pandemic, Iranian government have focused all its activities in the following major domains:

- Governance and reporting system
- Implementation and executive management
- Awareness rising and public education
- Response to emergencies
- Procurement of medication and personal protective equipment
- Academic educational and research activities
Several macro-level governance strategies have been developed in Iran, including:

- Foundation of a national Covid-19 command center
- Development of a strategic plan
- Mobilization of Charities and NGOs
- Fund raising (domestic and international)
Implementation and Executive Management

• Following activities are the main implementation tasks:
  - Disinfecting public places
  - Development of a national screening system
  - Publication of daily figures and statistics
  - Launching a national network of laboratories
All policies were designed and implemented according to precise epidemiologic calculations

Yazdani et al, Unpublished Data
We established a precise mapping system to track and record Covid-19 cases all across Iran. This map is being updated on a daily basis.
Awareness Raising and Counselling

• The major public education, awareness raising, and counselling activities were as follows:
  
  - Liaison with the domestic and international media
  
  - Subsiding public panic
  
  - Launching telephone counselling services
Provision of Emergency Services

• Following emergency services has been provided:
  - Expanding the infrastructure of national emergency system
  - Prioritizing Covid-19 related emergencies
  - Provision of home emergency services to ease the burden of the hospitals
Providing Medications and Protective Equipment

• Main strategies are as follows:

  - Increasing the capacity of domestic production of medicines, protective equipment, and disinfectants

  - Formation of a multidisciplinary supervision system to prevent and potential mismanagement of resources
Education and Research Activities

• The main research and educational activities were as follows:
  - Formation of a Covid-19 Epidemiology Committee
  - Supporting related research and technology development
  - Development of a student-oriented research committee
• Health system of Islamic Republic of Iran has witnessed remarkable progresses during the recent decade, including:
  - Transformation towards universal health coverage
  - Insurance of more than 90% of its 83 million population
  - Development of a well-established primary healthcare network
  - Establishment of an initiative against non-communicable diseases

• Nonetheless, sanctions against Iran posed an enormous burden on the health system, particularly in terms of provision of medication of Personal Protective Equipment

Conclusions

• Ample scientific evidence indicates that intermittent fasting may have several health benefits in a healthy individual with proper nutrition.

• In Covid-19 Pandemic, healthy individuals can fast similar to past years, as recommended by the WHO and other authorities.

• Fasting can cause serious health damages in certain diseases such as diabetes, and may even increase the risk of Covid-19 infection.

• Those who have contracted Covid-19 should not fast, and refrain from fasting several weeks after recovery (according to published guidelines).

• The elderly and those with diseases such as diabetes should be generally advised against fasting this Ramadan.

• This Ramadan, in Iran, we have adopted a multifaceted approach against Covid-19, and the infection seems quite under control.
Thank you!