



# Ramadan Fasting and Feasting Illustrated!

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J Diabetes Endocrine Practice

## Abstract

### Keywords

- ▶ Ramadan fasting
- ▶ diabetes
- ▶ hyperglycemia
- ▶ Ramadan feasting
- ▶ continuous glucose monitoring

This vignette highlights the challenges faced by individuals with diabetes during Ramadan fasting and provides recommendations for effective management. The vignette presents the case of a 56-year-old man with type 2 diabetes who observes Ramadan fasting without seeking medical advice, resulting in poorly controlled blood glucose levels and associated symptoms. It underscores the importance of pre-Ramadan consultation, frequent blood glucose monitoring, and tailored management plans to address the unique needs of patients with diabetes during this religious observance.

## Introduction

Most people with type 2 diabetes (T2D) can fast safely. Proper management involves pre-Ramadan preparation, risk stratification, Ramadan-focused education, and sound counseling.<sup>1,2</sup> By providing comprehensive education, personalized care plans, and ongoing support, health care providers strive to ensure that individuals with T2D can observe their fasting with confidence<sup>3</sup> and without compromising their overall well-being.<sup>4</sup>

In addition to maintaining a healthy diet to mitigate the risk of nocturnal hyperglycemia and daytime hypoglycemia,<sup>5</sup> adjusting medication regimens is essential for individuals with T2D during Ramadan fasting. Understanding the nature of medications<sup>6</sup> and the optimal timing for exercise is crucial for ensuring safety and efficacy during fasting periods. Regular monitoring of blood glucose levels at specific intervals is also critical to proactively prevent both hyperglycemia and hypoglycemia episodes, thereby optimizing glycemic control throughout the fasting period.<sup>7</sup>

Despite the wealth of knowledge and practical guidelines readily available, some patients resort to online sources and

may encounter unexpected or contradictory information regarding the management of their condition. This highlights the importance of providing reliable and accessible educational resources. Utilizing advanced diabetic technology, such as continuous glucose monitoring (CGM), offers a unique opportunity to illustrate real-world scenarios and enhance understanding among health care professionals and patients alike.<sup>8</sup>

Through this clinical vignette, we aim to shed light on a case that exemplifies the complexities of diabetes management during Ramadan fasting, leveraging high-diabetic technology to provide valuable insights and educational opportunities.

## Case History

The 56-year-old man, with a medical history of T2D for 20 years, presents to the diabetes clinic for a routine follow-up visit. He also has a history of hyperlipidemia and is a known smoker. The patient complains of fatigue, weakness, polyuria, polydipsia, and blurred vision. His current medications include glimepiride 4 mg daily, metformin 1,000 mg

DOI <https://doi.org/10.1055/s-0044-1787538>.  
ISSN 2772-7653.

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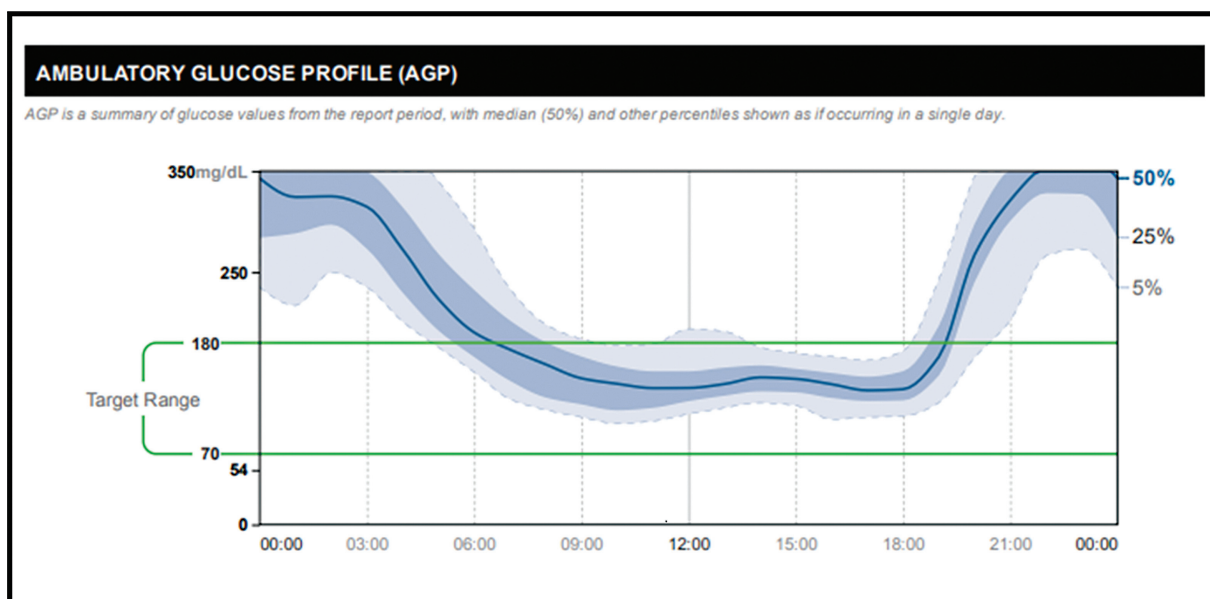
twice daily, empagliflozin 10 mg daily, pioglitazone 15 mg daily, insulin degludec 16 units once daily, and Humalog 6 units before each meal. During Ramadan fasting, he modified his insulin regimen to insulin degludec 8 units and insulin lispro 4 units, both taken at Iftar time, without medical consultation. Additionally, he is on atorvastatin 20 mg daily.

On physical examination, blood pressure of 124/68 mm Hg and a pulse rate of 74 beats per minute were observed, which were all within normal limits. General appearance was unremarkable, with no focal abnormalities noted in the head and neck examination. Cardiopulmonary auscultation revealed a regular heart rhythm and clear lung fields. Abdominal examination demonstrated no tenderness or masses, and bowel sounds were present. Extremities showed no signs of edema or abnormalities. Neurological examination revealed intact mental status, cranial nerves, motor,

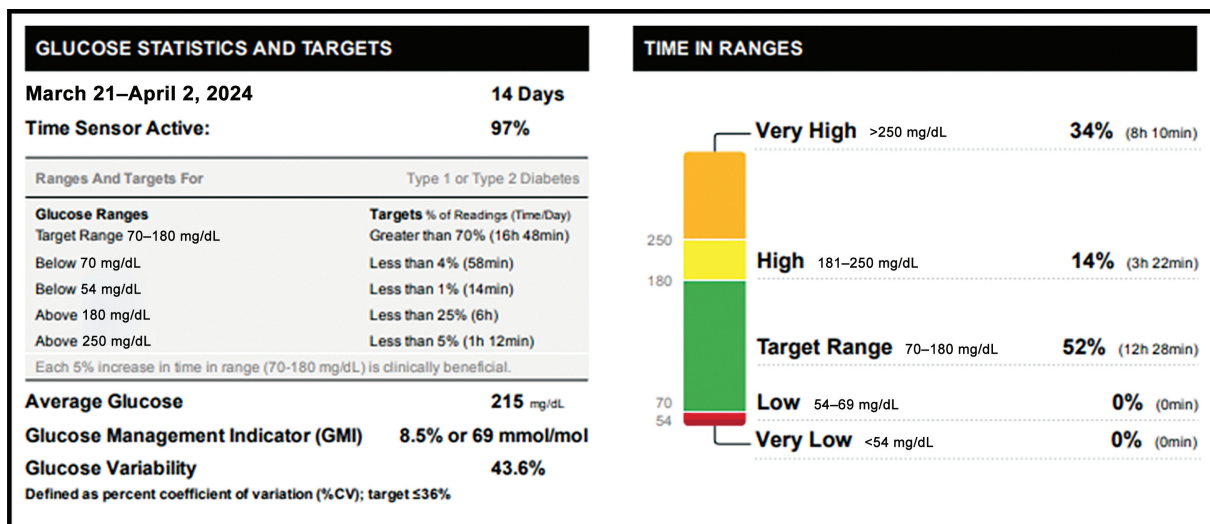
sensory function, and reflexes. Skin inspection revealed no concerning lesions or rashes.

The latest glycosylated hemoglobin (HbA1c) 6 weeks previously was 9%, estimated glomerular filtration rate (eGFR) was 102, total cholesterol was 3.49 mmol/L, low-density lipoprotein (LDL) was 1.8 mmol/L, and his microalbuminuria screening was negative. Clinic blood glucose, done at 14:15 (while fasting), was 164 mg/dL.

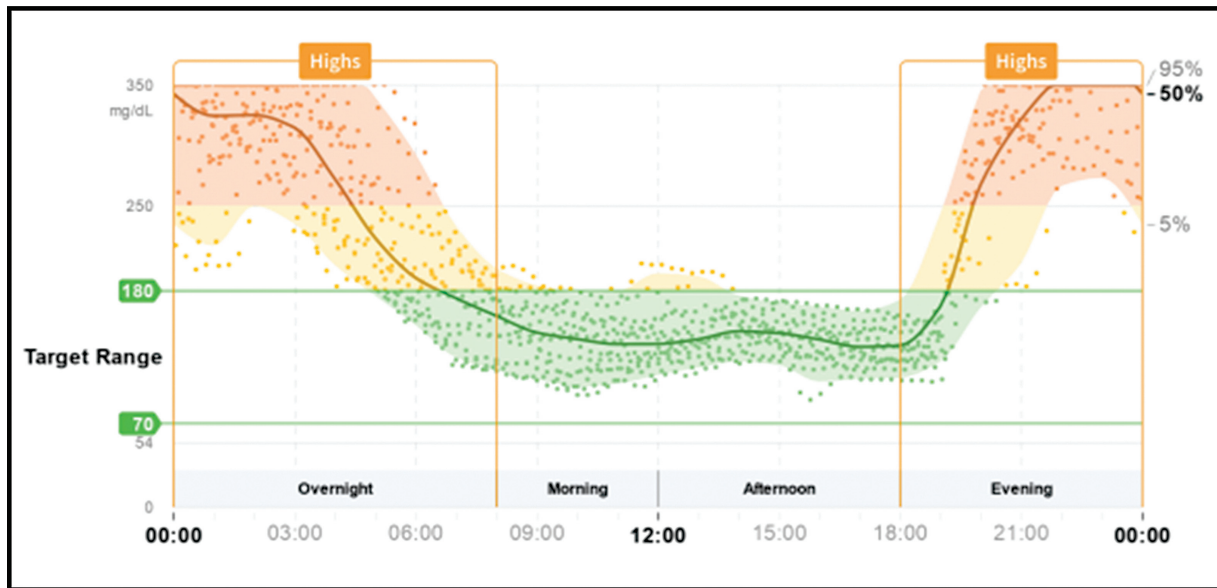
The 14-day ambulatory glucose profile (AGP) using the FreeStyle Libre was downloaded for 2 weeks (►Fig. 1). The AGP metrics revealed the following: time sensor active, 97%; 24-hour glucose average, 215 mg/dL; time in range, 52%; time above range, 48%; glucose management indicator, 8.5%; blood during day fasting hours, 90–180 mg/dL; ►Fig. 2); no hypoglycemic episodes; hyperglycemia immediately after Iftar and continuing throughout the night; extremely high



**Fig. 1** Fourteen-day ambulatory glucose profile (AGP) using the FreeStyle Libre. The blue curves depict the 50th (median), 25th, and 5th centiles across the 24-hour clock in relationship to the target range (between the green horizontal lines set here as 70–180 mg/dL).



**Fig. 2** The continuous glucose monitoring metrics and the targets: The numerical measurements and calculations are shown on the right graphic representation of time in range.



**Fig. 3** The color-coded 14-day ambulatory glucose profile (AGP) demonstrates the relationship between day and night time with the individually depicted interstitial blood glucose values.

during the eating period (sometimes exceeding 350 mg/dL); and no hypoglycemia during eating hours (► **Fig. 3**).

Further interrogation revealed several factors contributing to these findings, including the consumption of sugary drinks and juices when breaking the fast, inadequate water intake, taking additional meal at 11 p.m., skipping the predawn meal (*suhoor*), and lack of physical activity during Ramadan.

The management plan involved comprehensive diabetes and diet education tailored to the patient's Ramadan fasting practices, addressing lifestyle factors such as sugary drink consumption and inadequate water intake. Strategies included increasing physical activity, adjusting short-acting insulin at Iftar to 8 units, adding 4 units before the 11 p.m. meal, which he regularly takes during Ramadan, and regular monitoring of glucose levels for titration. [9] Emphasis was placed on personalized support and follow-up to optimize glycemic control and ensure adherence to the recommended lifestyle modifications and medication regimen.

## Discussion

This case demonstrates several important practical points of diabetes care during Ramadan fasting and illustrates very readily using diabetes technology. The principles and practicalities of care are amply discussed elsewhere.<sup>2</sup> Pre-Ramadan consultation to modify medications and develop an appropriate plan during Ramadan is crucial.<sup>2</sup> The patient in the presented case had poor glycemic control before Ramadan, as reflected in his HbA1c level, yet he chose to fast without seeking professional advice. His duration of diabetes, HbA1c level, and the polypharmacy, including intensive insulin therapy, put him readily in the moderate-risk category.<sup>2</sup> Individualization of care to optimize the care is paramount.<sup>3</sup> Nutritional guidance is essential for safe fasting. This would have prevented excess consumption of

sugary drinks at Iftar time and made him distribute his meals properly.<sup>5</sup> Diabetes education on diabetes self-management during Ramadan is paramount. Frequent monitoring of blood glucose levels throughout the day is crucial to detect and promptly manage blood glucose fluctuations (hypoglycemia and hyperglycemia). In our patient, the omission of some of his insulin made him avoid hypos in the daytime but sustained very high levels throughout the nighttime. Also, lack of exercise must have contributed to the high blood glucose levels. Timely medical attention should be provided when necessary.

## Conclusion

The case presented in this study underscores the pervasive challenge of high blood glucose levels during Ramadan fasting, particularly among patients with diabetes who fail to adequately modify and monitor their condition. Hyperglycemia, often considered the “elephant in the room,” presents significant health risks comparable to hypoglycemia, yet it is frequently overlooked. This emphasizes the critical need for proactive management strategies, including pre-Ramadan consultations, individualized medication adjustments, and comprehensive diabetes education. Importantly, the integration of diabetes technology, such as CGM systems like the FreeStyle Libre used in this case, offers substantial benefits. CGM allows for real-time monitoring and analysis of glycemic patterns, enabling health care providers to tailor treatment regimens more effectively and patients to make informed decisions about their lifestyle choices. By leveraging diabetes technology, clinicians can better understand glycemic fluctuations, identify trends, and implement timely interventions to mitigate hyperglycemia-related complications, ultimately enhancing patient outcomes and ensuring safe fasting during Ramadan.

#### Patient Consent Statement

All the patients in our institution provided a general consent for their information to be used anonymously for education, research, and quality improvement. The authors confirm that the patients' data are presented completely anonymously. Patients cannot be identified from any of the information.

#### Authors' Contributions

Both authors contributed to the patient's clinical care data collection and contributed to the manuscript intellectually. Both approved its final version.

#### Compliance with Ethical Standards

No prior ethical approval is required for single case reports and small case series.

#### Conflict of Interest

None declared.

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