

Type 2 diabetes mellitus and Ramadan fasting: a continuous glucose monitoring (CGM) study of glucose excursions in a group of patients with good glycaemic control

N. Lessan¹, H. Hasan² & M. Barakat¹

► Author affiliations

Introduction: Muslims including many patients with diabetes mellitus practice dawn to sunset fasting during the month of Ramadan. Using CGM recorded data we have investigated glucose excursions with Ramadan fasting in a group of patients with type 2 diabetes mellitus and good glycaemic control.

Methods: Thirty-four patients with type 2 diabetes mellitus (8 female, 26 male, age 46.5 ± 11.1 years, HbA1c $6.9 \pm 1.0\%$, BMI 29.5 ± 6.5 kg/m²) underwent CGM for a minimum of three consecutive days during Ramadan fasting. Comparison with non-fasting CGM was made. Diabetes treatment ranged from none to a mixture of insulin and oral hypoglycaemic agents. Any change in treatment dose/timing during Ramadan followed ADA guidelines. Using CGM sensor values for average (avG), minimum (minG) and maximum (maxG) glucose, duration of time below lower limit (<80 mg/dl-DBL), within limit (80-150 mg/dl-DWL) and above higher limit (>150 mg/dl-DAL) for each patient, mean & SD values were obtained for the group as a whole during and outside Ramadan fasting periods. Comparison was made using paired t-test (SPSS 20).

Results: The group had good glycaemic control as indicated by HbA1c and mean CGM glucose. There were no statistically significant differences in avG, minG, maxG, DBL, DWL or DAL outside and during Ramadan fasting (Table 1). During Ramadan fasting period mean CGM curve showed a characteristic rapid rise in CGM recorded glucose at iftar time.

Conclusion: In this group of patients with good glycaemic control, overall CGM measures of glucose control and excursions show no significant changes with Ramadan fasting. However, timing and pattern of glucose fluctuations were different with a major rise at time of evening meal. Management during Ramadan should specifically address these areas.

Table 1

	Non-fasting	Fasting (Ramadan)	P
avG (mg/dl)	138.5 $\pm$ 37.1	140.5 $\pm$ 29.0	0.67
minG (mg/dl)	70.8 $\pm$ 27.0	69.0 $\pm$ 15.6	0.72
maxG (mg/dl)	232.8 $\pm$ 72.0	246.8 $\pm$ 72.2	0.37
DAL (%)	34.6 $\pm$ 31.6	31.1 $\pm$ 25.7	0.47
DWL (%)	58.7 $\pm$ 30.1	65.9 $\pm$ 23.7	0.11
DBL (%)	7.9 $\pm$ 15.9	2.7 $\pm$ 4.1	0.066

Declaration of interest: The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research project.

Funding: This work was supported, however funding details unavailable.