Ramadan fasting among Muslim in Type 2 Diabetes: A comparison between patients with good and poor glycemic control using continuous glucose monitoring (CGM)

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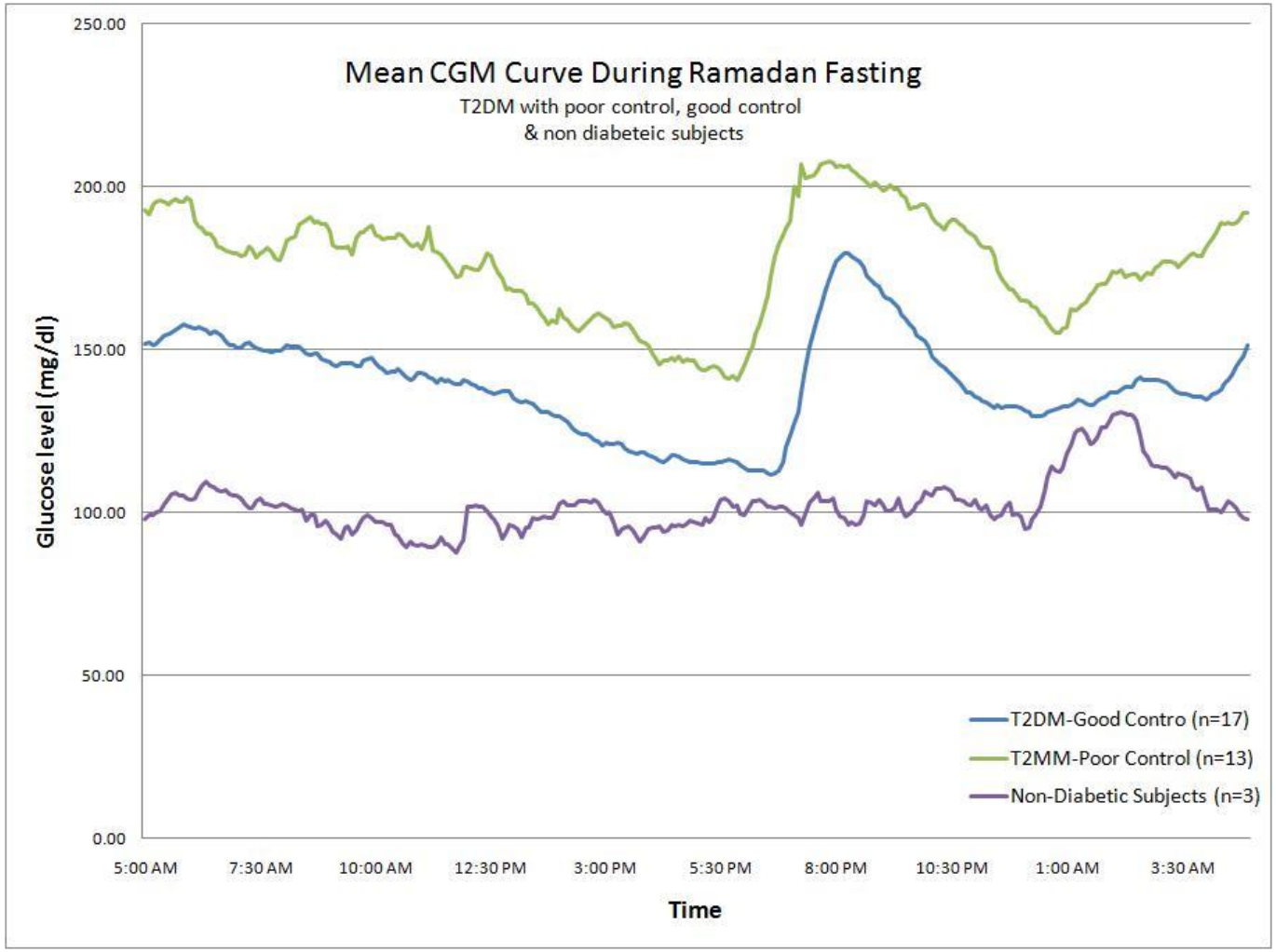
Many Muslim patients with diabetes practice dawn to dusk fasting during the holy month of Ramadan. We have used CGM to explore and compare the changes in glucose profiles among patients with good and poor glycemic control.

Thirteen patients with type 2 diabetes mellitus (T2DM) and poor glycemic control (age 46 ± 8 years, BMI 30.8 ± 4.2 kg/m2) were compared with seventeen patients with T2DM and good glycemic control (age 43 ± 13 years, BMI 27.5 ± 4.1 kg/m2). For each subject CGM was performed for three days before and later during Ramadan fasting. Any change of treatment was at the discretion of the attending physician. CGM during Ramadan fasting period was performed on three non-diabetic volunteers. Mean CGM curves were constructed on each group for Ramadan and non- Ramadan periods.

With Ramadan fasting, mean glucose level increased from 172.2 + 17.6 to176 + 16.5 mg/dl in poorly controlled group ($p< 0.0001$) and from 135.3 + 5.7 to 139.3 + 15.3 mg/dl in well controlled group ($p<0001$). During Ramadan fasting period CGM curves in both well controlled and poorly controlled patients showed a characteristic rapid rise in blood sugar at Iftar (breaking of the fast) time. The magnitude of this rise was higher in the poorly controlled patients. There was a highly significant difference in mean glucose level between the two groups which persisted during Ramadan fasting.

Minor overall deterioration in glycemic control occured among diabetic patients. In both groups glycemic control average glucose was lower between sunrise and sunset and higher after sunset. Patients with diabetes should need to have adequate control before deciding to fast during Ramadan. Nutritional advice should include reducing high glycemic index food during Iftar.


Mean CGM Curve During Ramadan Fasting
T2DM with poor control, good control
& non diabeteic subjects
250.00
200.00
150.00
100.00
50.00
0.00
Glucose level (mg/dl)
5:00 AM
7:30 AM
10:00 AM
12:30 PM
3:00 PM
5:30 PM
8:00 PM
10:30 PM
1:00 AM
3:30 AM
Time
T2DM-Good Contro (n=17)
T2MM-Poor Control (n=13)
Non-Diabetic Subjects (n=3)