Ramadan Fasting among older children and adolescents with Type 1 Diabetes:

A real world study from the UAE

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Background

Ramadan fasting (RF) is a religious obligation for all healthy adult Muslims. The sick including patients with type 1 diabetes (T1D) and pre-pubertal children are exempt, but many choose to fast for cultural and other reasons.

Objectives

In this "real world" study, we have investigated glycaemic control (HbA1c, and continuous glucose monitoring-CGM, or flash glucose monitoring-FGM) in the context of RF in children and adolescents with T1D and compared outcomes in patients on multiple daily injections (MDI) and those on continuous subcutaneous insulin infusion (CSII) among the patients.

Methods

Children and adolescents with T1D, and their families seen at ICLDC, who were insisting on fasting in the ensuing Ramadan were educated about diabetes management during RF. Insulin dose was adjusted and remote medical support was made available as necessary. Data on reported number of fasting days, hypoglycaemia episodes, and diabetic ketoacidosis (DKA) were obtained through patient and family interviews. Information on weight, HbA1c, and blood glucose levels from CGM/FGM before (within one month prior), during, and after (within one month afterwards) Ramadan were retrieved retrospectively from the electronic database. Data are presented as mean ± SD.

Results

47 patients, all with T1D (age 13.40 ± 2.42 years; diabetes duration 4.6 ± 3.1 years; 29 (61.7%) males (age 13.69 ± 2.54 years); 18 (38.3%) females (age 12.94 ± 2.21 years) ; 26 (55%) on MDI and 21 (45%) on CSII were included in the study. 42 (89%) were able to fast for 22.3 ± 8.7 days during Ramadan. No statistically significant differences were seen in CGM/FGM generated mean blood glucose level before, during, and after Ramadan [one-way ANOVA ($F(2,80)=1.600$, $p=0.21$-Table 1)], and in mean HbA1c (9.0 ± 1.7 v 8.7 ± 1.3%) and weight (53.3 ± 18.0 v 54.9 ± 19.3 v kg) between pre and post-Ramadan periods ($p=0.10$ and $p=0.60$, respectively). Between MDI and CSII, there was no significant difference in fasting days ($p=0.49$), frequency of hypoglycaemia episodes ($p=0.98$), DKA frequency ($p=0.37$), HbA1c level ($p=0.24$), and weight ($p=0.11$) after Ramadan.

Discussion

Although RF for children and adolescents with T1D particularly those with poor glycaemic control involve high risks, patients do undertake RF due to religious or other reasons. Our data show no significant deterioration in indicators of overall glycaemic control which remained inadequate. RF should be discouraged in children with poorly controlled T1D.

Mean blood glucose	**mg/dL**	**p-Value (one-way ANOVA)**
Pre-Ramadan (n=32)	226.5 ± 54.6	0.21
During Ramadan (n=19)	251.6 ± 46.2	
Post-Ramadan (n=32)	225.7 ± 58.8	

Table 1. CGM/FGM calculated mean blood glucose level before, during, and after Ramadan.