Evaluating the Impact of Ramadan Fasting on Ambulatory Glucose Profile among Patients with Type 1 Diabetes using Flash Glucose Monitoring System: A Comparative Study

Ayman A. Al Hayek, Asirvatham Alwin Robert, Abdulghani H. Al Saeed, Mohamed Abdulaziz Al Dawish

INTRODUCTION

Earlier studies stated that the patients with T1D are believed to be at higher risk for diabetes related complications (hypoglycemia, hyperglycemia, diabetic ketoadisis) during the Ramadan fast, and most of the expert professional guidelines discourage them from fasting. However, in the face of such clear exemptions granted by the medical and religious authorities, many patients with T1D persist in pursuing the practice of fasting during Ramadan.

AIM

The present research was done as a comparative study, with the objective of observing the glycmic profile changes that occur prior to, during, and post the Ramadan fast.

METHODS

The patients included in this comparative study were a convenience sample of 87 patients with T1D (in the 14- to 40-year age group), who received Multiple Daily Injections (MDIs), and used the FreeStyle Libre (FSL), as well as practiced Ramadan fasting, during 2021. According to the risk stratification proposed by the Diabetes and Ramadan (DAR) guidelines, patients affected with T1D for ≥1 year and utilizing the continuous FreeStyle Libre® for self-monitoring of their glucose levels, and 14 years of age and above, are qualified to fast. Patients who fulfilled these criteria were selected for the present study. However, based on the following standards, the patients excluded from this study comprised the T2D patients, those with uncontrolled T1D (HbA1c >8.5 %; 69 mmol/mol) and those at very high risk for fasting based on the DAR guidelines. A few more criteria for exclusion included, a history of intense hypoglycemia and an unexplained DKA episode three months prior to Ramadan, an earlier history of hypoglycemia unawareness, pregnancy, chronic kidney disease stages 4 and 5 or those on chronic dialysis, and finally those showing advanced macrovascular complications. The study compare the data on the glucose levels for the period of Ramadan and one month preceding and after Ramadan, including the mean glucose (mg/dL) values, TR (% of the time between 70 and 180 mg/dL), Time-Below-Range (TBR) (<70 mg/dL or <54 mg/dL), Glucose Variability (GV) meaning the glucose coefficient of variation (% CV) and Glucose Monitoring Indicator (GMI %) [18].

RESULTS

The study population revealed the mean age to be 24.3 ± 8.2 years, with females being the predominant in the total sample, at 52.9 %. A greater number of the study population fell in the age category of ≥20 (59.8 %) years, 72 (72.4 %) had been affected with diabetes for ≤10 years, and 79 (79.3 %) revealed BMI ≥25 kg/m2. Compared to the pre-Ramadan values, no significant alterations were noticeable in terms of the low glucose events, percentage below 70 mg/dL, average duration of the hypoglycemic events and percentage of glucose level below 54 mg/dL. On comparison with the pre-Ramadan values, the frequency of the FSL scanning/day was higher during the Ramadan month among the patients (7/6/day vs 9.78/day; p = 0.042).

However, for the variable time sensor is active, no significant changes were observed for all three times pre-, during and post-Ramadan. When compared with the pre-Ramadan values, no significant changes were evident in the glucose variability, average glucose, glucose management indicator, % in target (70-180 mg/dL), TAR (181-250 mg/dL) and %< 250 mg/dL), in the values during and post Ramadan.

Glucose data for the period of Ramadan and one month preceding and after Ramadan

CONCLUSIONS

patients with T1D, who use FGMS can practice fasting during the Ramadan month, if they are given suitable education and directions. One study demonstrated that children and adolescents with T1D and who utilize the FGMS could fast during Ramadan, without running the risks of severe hypoglycemic episodes (namely seizure, coma), which can be life-threatening, or even DKA, . However, the recommendations of that study were to implement the strategies of adequate education and good glycemic control prior to Ramadan, as well the scrupulous use of FGMS to achieve good results.

BIBLIOGRAPHY