

Commentary on – ISPAD Clinical Practice Consensus Guidelines: Fasting during Ramadan by Young People with Diabetes

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This is a commentary on the recent work by our group on fasting during Ramadan by young people with diabetes which was published as ISPAD Clinical Practice Consensus Guidelines [1]. In this commentary, themes of selected studies published following the guidelines release are highlighted. Studies that either confirmed important requirement for safe fasting that we highlighted in the

guidelines summary or studies that added new interesting findings in Ramadan research are discussed. A summary conclusion is drawn on what the additions or confirmation are to our previously written guidelines (Table 1).

The first bibliometric study on diabetes in Ramadan was published in 2019 by Beshyah et al. aiming to quantify

	Study theme/conclusion	Reference
1	Research in Ramadan is on the increase but well-designed studies, including randomized controlled studies are lacking	[1-3]
2	Pre-Ramadan education remains a key for successful fasting	[4-7,9]
3	The better the pre-Ramadan control, the higher the number of days fasted	[8]
4	People who intend to fast will fast regardless of medical advice	[10]
5	Glucose monitoring results in reduction of complications during fasting	[12-13]
6	Higher DKA frequency during Ramadan might be a myth	[14]
7	Mode of insulin delivery might not be the main factor on glucose control	[15,16]
8	Using the fasting patient as a human model to understand physiology of fasting is feasible	[17-19]

Table 1: Summary of study themes/conclusions published on Ramadan fasting by young people following the release of the guidelines by Deeb et al.

the research contribution to Ramadan fasting by people with diabetes. It described a total of 424 articles; 112 were “Open Access”. Two-thirds of articles were original research. UK-based authors and affiliated institutions were dominant. The number of publications and the extent of international collaborations were still lower than expected, considering the wide international observing of Ramadan fasting and the increased prevalence of diabetes [2]. Over the last 2 decades, there has been an increase in the volume of literature related to Ramadan fasting. This reflects the increasing interest in the global production of scholarly work related to Ramadan as well as the increased interest in research and clinical practice in the topic [3]. However, there remains to be a paucity in the number of randomized controlled trials in the field. Majority of the published studies are small, retrospective and come from single centers. There is also a trend of increment of studies supported by pharmaceutical companies aimed for promoting the drug market [3].

The importance of pre-Ramadan education that we highlighted in the guidelines is re-confirmed in further studies. In a study at a primary health care center, it was observed that the frequency of hypoglycemia was high during Ramadan. This was particularly the case in younger type 1 patients, those with longer duration of diabetes. The significant results were that most of patients did not receive any education with instructions regarding self-care immediately before or during Ramadan [4]. Implementation of pre-Ramadan education remained low in many centers. In a study by Savaş et al., 65.8% of patients did not receive pre-Ramadan counselling and 83.5% did not see a physician during Ramadan. These results indicated that neither patients nor health care professionals acknowledge the importance of pre-Ramadan education [5].

A qualitative study demonstrated lack of knowledge on proper diabetes management by patients who insisted on fasting during Ramadan. Access to pre-Ramadan education was the main barrier indicated by patients. In addition, most of the patients were unsatisfied with availability of essential medications, glucometers and blood testing [6]. Continuation of education support during Ramadan is valuable. Better education and knowledge of diabetes management during Ramadan is found to correlate with blood glucose in target. This was particularly the case for the fasting readings which were shown to be lower than those of the month after [7]. In addition, improving diabetes control before Ramadan is shown to significantly increase the ability of patients to fast. A study by Al Balhan et al. showed that number of days fasted by patients with better diabetes control was significantly higher than the those fasted by poorly controlled patients [8].

Education over nutrition remains a crucial aspect for

safe fasting. A study explored how structured nutrition education might impact fasting in patients with diabetes. Semi-structured interviews were conducted with 40, Dose Adjustment for normal Eating [DAFNE] graduates who fasted Ramadan. The study demonstrated that a program like DAFNE enhanced patients’ confidence, self-reliance and reduced glucose fluctuation and complications [9].

More studies confirmed the previous observation of patients, who are perceived to be of the high-risk group, insisting on fasting against medical advice. A significant number of them continue to fast despite hypoglycemia [10]. Hence, proper education for those patients is crucial to ensure safe fasting. It was also noted that the stronger the religious beliefs and practice affected the intention to fast regardless of the risk taken [8].

Provision of well-trained diabetes educators for the purpose of Ramadan training might not be widely available. However, such education can be provided by professionals outside diabetes teams. A study in Sudan explored the possible education contribution by community pharmacists who were enrolled in a study. The pharmacists showed sufficient knowledge on good clinical practice in diabetes management during Ramadan that can be utilized for education [11].

In addition to education and its access, glucose monitoring is confirmed to be an essential tool to ensure complication-free fasting. A group of type 1 diabetes patients who are considered of high risk for fasting were involved in a prospective interventional study. Patients were offered ‘optimal diabetes care’ defined as open access to clinic and provision of continuous glucose monitoring (CGM) devices. Glycemic control in the enrolled patients showed significant improvement in diabetes control and reduction of complications [12]. This signifies the importance of glucose monitoring and access to education to ensure safe fasting. CGM remained a powerful tool to aid safe Ramadan fasting. High risk patients were offered flash glucose monitoring and had focused education on diabetes management. In this group, a significant improvement in glycemic control was seen with no significant interruption of fasting [13].

Diabetes ketoacidosis [DKA] has always been a concern in Ramadan fasting. Recently, Beshyah et al. studied the frequency of hospital admissions due to DKA during Ramadan compared with the rest of the months. The study examined retrospective data of 10 years and confirmed that the DKA admission during Ramadan was not significantly higher than the other months of the year [14].

Fasting by children and adolescent with diabetes is particularly debatable which led us to writing the guidelines. However, people started acknowledging that

young people with diabetes can fast safely provided that certain measures are taken. A recent study by Mohamed et al., showed that fasting of children with type 1 diabetes above the age of 10 years is feasible and safe. The latter is on the condition that families and their children are educated on fasting management before Ramadan and glucose monitoring is implemented. This study, like many others listed in the guidelines, did not show significant difference in breaking fast days, frequency of hypo or hyperglycemia in pump and non-pump groups [15]. Patients with better diabetes control prior to Ramadan were at a lesser risk of developing hypoglycemia.

We have examined at length the effect of the insulin regimes and delivery impact on glycemic control in Ramadan [1]. Recently, a systematic review involving 9 studies showed no significant difference for the change in glycemic control, weight or lipid profile between pump therapy and multiple daily injection of insulin [16]. Data was not sufficient to assess the difference in relation to hypoglycemia or DKA.

Many recent studies examined the vital functions of the human body during fasting Ramadan. While the fasting month is associated with reduced activity and sleeping time, there is no significant change in resting metabolic rate or total energy expenditure. Reported weight changes with Ramadan in other studies could possibly be due to differences in food intake [17]. Furthermore, it is suggested that Ramadan fasting may affect cognitive activities such as spatial memory, visual memory. These activities play an important role in effective education [18]. However, such findings need to be confirmed by larger studies targeting different cognitive tasks. The effects of Ramadan fasting on physical activity profile of soccer players was observed through a satellite global positioning system during a 90 min match. Locomotor data of 13 trained players were averaged over four simulated matches; two were played in the non-fasting and two in fasted state. Players' physical activity profile was adversely affected by Ramadan fasting regarding covered distances, achieved speed, and perceived exertion. This negative impact was evident in the initial stages of the match despite similar metabolic profiles [19].

While we have indicated above the rapid rise of research in the Ramadan fasting field in diabetes, there is still work required to better design Ramadan studies. We confirm the importance of pre-Ramadan education and glucose monitoring for safe fasting. We also emphasize that insulin delivery of being multiple daily injection of insulin pump therapy is not necessarily an essential factor to prevent complications. We aim for this communication to serve as a call for expedited well-designed studies for fasting Ramadan by young people with diabetes. Only then we can draw factual conclusions.

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