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DIABETES IN RAMADHAN' EDUCATION PROGRAM: MAXIMIZING BENEFITS, MINIMIZING RISKS

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Abstract: *The incidence of Type2 Diabetes Mellitus (DM) in Malaysia is increasing, with 59% in Malays followed by other races. Fasting in Ramadhan is beneficial, however in those with DM, it is challenging, requiring sufficient and comprehensive medical advice. This novel diabetes in Ramadhan dietary education program aims to facilitate knowledge attainment to mitigate the risk of complications in Ramadhan and to pave the way to fasting safely. This activity was conducted at the UiTM Medical clinic facilities by the Endocrine team consisting of physicians and diabetic educator, facilitated by a specially designed educational guide, which was a compilation of important information on managing the challenges DM patients during fasting, concentrating on healthy dietary practices - gathered from the Malaysian DM clinical practice guidelines and the International Diabetes Federation (IDF) Diabetes in Ramadan guideline. This compendium was designed mainly in the Malay language to enable better understanding in Malaysian population. The program provided comprehensive education on fasting in Ramadhan for people with DM in an engaging manner, organised into two main parts: (1) small group educational-lectures; and (2) personalised risk stratification with medical advice. The educational reference guide detailed important information on the risk categories for fasting in Ramadhan, timing of blood sugar monitoring, when to break the fast in the event of complication with management steps, medication adjustment, and dietary advice with practical tips. This innovative program has been tailored for use in the local*

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population, and provides an essential service that is hugely beneficial, but currently lacking in this country. With this comprehensive and engaging platform, important information on managing diabetes in Ramadhan can be accessible to a wider population, leading to better patient care, and hence a has huge potential for sustainability. A larger multi-centre program will be required for a greater impact.

Keywords: *Diabetes Fasting Guide, Diabetes in Ramadhan, Diabetes Mellitus, Education Program, Fasting*

Introduction

Fasting in the month of Ramadhan is one of the pillars of faith in Islam and is obligatory for healthy Muslim adults. It involves fasting continuously for one month, from dawn to sunset, and requires abstinence from a few factors, which includes eating, drinking, cigarette smoking, and notably refraining from taking oral medications.

Although Ramadhan fasting is obligatory, there are exemptions. These include those who are ill or live with a medical condition, including some people with diabetes mellitus. However, the vast majority of people living with diabetes choose to fast and sometimes choose to do so in contrary to medical advice. According to the latest estimates from the International Diabetes Federation (IDF), 463 million people are living with diabetes worldwide, a figure that is set to reach 700 million by 2045 (Hassanein M.M. et al, 2020). This dramatic rise will be highest in regions with large Muslim populations such as Africa, Middle-East and North Africa and South-East Asia (Saeedi P. et al, 2019).

Literature Review

The incidence of Type 2 Diabetes Mellitus (DM) in Malaysia is increasing, with an estimation of 3.9 million adults diagnosed according to the recent Malaysian National Health and Morbidity Survey (NHMS) in 2019. This is contributed largely by the Malay race with a prevalence of 59%, followed by the other races (National Health and Morbidity Survey [NHMS] 2019), translating into a significant proportion of people with diabetes who will be fasting in the month of Ramadhan in Malaysia. Indeed, Malaysia lies in the geographical region with the highest Muslim population in the world (International Diabetes Federation [IDF] 2021), and in an international survey assessing people with Type 2 DM it was seen that more than 95% of these patients fast in Ramadhan regardless of their diabetic control, contributing to the largest number when compared to the other participating countries (Salti I, Benard E, & Detournay B et al, 2004).

Metabolic Changes During Fasting

Ramadhan fasting may have an impact on metabolic profile as a reflection from lifestyle changes during continuous fasting, including caloric restrictions, alteration in physical activities and sleeping patterns. Those fasting in Ramadhan generally consume two main meals per day, namely the predawn meal (suhoor) and the sunset or breaking of fast meal (iftar), but many, depending on the region, may also eat snacks during permitted hours; and this can inevitably disturb glycaemic balance (M. Almulhem et al, 2019), (N. Lessan et al, 2018) leading to erratic diabetic control. In addition, the composition of meals often changes in Ramadan to foods richer in carbohydrates and saturated fats, which may also have a negative impact on sugar levels (M. Al-Arouj et al, 2010).

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In a review of three large epidemiological studies looking at the evolution of fasting patterns during Ramadan and associated clinical outcomes in adults with type 2 diabetes mellitus over two decades (2000–2020), it was shown that over a period of time people with diabetes choosing to fast during Ramadan manifest increasingly complex profiles in terms of their diabetes, with increased disease duration, greater body mass index, and elevated pre-Ramadan mean glycated haemoglobin (HbA1c) levels (Hassanein M.M. et al, 2020)

Dietary Impact

Comprehensive advice concerning dietary adjustment and medication titration during fasting is essential on approaching the holy month. Understanding nutritional habits and the impact of different dietary patterns aids greatly in managing glycemia during fasting. In a two-arm parallel study looking at the comparison between a structured nutrition therapy for Ramadhan with standard care in type 2 diabetes patients, it was shown that the structured nutrition regimen for Ramadhan had improvements in both clinical outcomes and quality of life (Mohd Yusof B.N. et al, 2020). Subsequently, a narrative review looking at 14 studies assessing the impact of nutrition on diabetes control in Ramadhan, there was evidence found for the effectiveness of Ramadhan-focused nutrition therapy, with some key features identified, namely an individualized caloric prescription; distributing carbohydrate-rich meals equally between suhoor, iftar and snack times; providing structured meal plans; tailoring food intake for Ramadhan; and incorporating diabetes-specific formula as part of suhoor or snack (Mohd Yusof BN et al, 2021).

Advantages and Complications

Numerous studies have shown contradicting results on both the benefits and deleterious effects of fasting on people with diabetes mellitus. In a prospective cohort study performed in Malaysia looking at various risk factors for hypoglycaemia in people with diabetes who fast in Ramadhan, it was found that old age (defined as above 60 years old) increased the relative risk of hypoglycaemia, whereas taking breakfast or predawn meal (suhoor) before fasting reduced the relative risk by more than half (Loke S.C. et al, 2010). A subsequent meta-analysis comprising of studies conducted in Asian, Middle-Eastern and African countries attested to a relatively low incidence of hypoglycaemia among people with type 2 diabetes mellitus fasting in the month of Ramadhan with a slight improvement in anthropometry and metabolic profile in this population (Dicky L.T. et al, 2020).

Fasting in Ramadhan for those with DM is challenging and needs close monitoring with sufficient and comprehensive medical advice. Diabetic complications during fasting is mainly seen in patients with improper disease control or inadequate information. A Malaysian survey assessing the perception and behaviour of people with Type 2 Diabetes towards management of diabetes during Ramadhan revealed that although the majority of respondents seemed to be able to fast without difficulties, most of these patients did not adjust their antidiabetic medications or monitor their blood sugar routinely during Ramadhan although they were aware of the importance of doing so (Lee W.H. et al, 2021).

In a nationwide survey assessing the characteristics of Malaysians with diabetes fasting in the month of Ramadhan, it was found that more than a quarter of the population break their fast due to diabetic-related conditions, with low blood sugar (hypoglycaemia) occurring in 17.8%, whereas 10.6% had high blood sugar (hyperglycaemia), leading to increased need for hospital visits (Zanariah H. et al, 2021). This was further illustrated in a countrywide study looking at admissions to general hospitals across the different states in Malaysia during the month of

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Ramadhan, which revealed a high number of admission due to diabetic emergencies, with more than half of the assessed population unable to recall receiving medical advice regarding managing diabetes in Ramadhan (Chin V.T. et al, 2021). Additionally, in another study assessing diabetes knowledge and management principles among Malaysian fasting in Ramadhan, which utilized self-administered questionnaires, it was revealed that only half of the population studied had average understanding on the condition, and factors such as education level, monthly income and working status were associated with better knowledge (Salimah Japar et al, 2022), further underlining the need to improve education and self-management practices among the population of people with diabetes during the fasting month. To address this issue, a special program was fashioned for patients attending the endocrine clinics in Universiti Teknologi MARA (UiTM) medical centre. This program aimed to fulfil a few objectives, namely: 1) To facilitate knowledge attainment and improve dissemination of information, 2) To mitigate the risk of diabetic complications in Ramadhan and 3) To pave the way to fasting safely.

Method

This diabetes in Ramadhan patient education program was specifically designed and conducted for the Muslim population with diabetes attending the endocrine clinics in UiTM, and was held for a whole month leading to the month of Ramadhan, targeting about 40 patients per week, utilizing IBM SPSS® program for analysis. Adult patients with Type 2 diabetes mellitus who were planning and eligible to fast were recruited and enrolled in this program. Ineligible patients, including those with advanced kidney disease, patients with dementia or reduced understanding of the risks of fasting, and patients with type 1 diabetes mellitus were excluded.

Referencing the Malaysian Type 2 DM clinical practice guidelines (Ministry of Health, 2020) and the International Diabetes Federation (IDF) Diabetes in Ramadan Guideline (IDF, 2021), important information on managing the challenges DM patients face in the fasting month was assembled and subsequently translated into an interactive and educational training program tailored for the local population. Risk stratification for patients fasting in Ramadhan was taken from the IDF guideline, which has itemized the specific factors influencing diabetes control, with further categorization into mild, moderate and high risk for fasting in people with diabetes. Lifestyle modification tips and glucose monitoring recommendations were taken from both the IDF guideline and the Malaysian clinical practice guidelines (CPG). The Malaysian CPG had the added advantage of being tailored to local requirements, and hence added a more personalized flavour to the program.

Structured Education Program

Themed ‘The Ramadhan Experience – Maximizing Benefits, Minimizing Risks’, this comprehensive patient education program was conducted in the diabetes and endocrine clinics at UiTM clinical facilities – both at Sungai Buloh Specialist Centre and at Hospital Al-Sultan Abdullah (HASA) UiTM Puncak Alam. Organized into two distinct parts, this program enabled effective multi-directional communication between patients, family members and healthcare professionals. The program provided comprehensive education on fasting in Ramadhan for people with DM in an engaging manner, organised into two main parts: (1) small ‘pocket group’ educational-lectures; and (2) personalised risk stratification with specialized medical guidance. The educational reference guide detailed important information on the risk categories for fasting in Ramadhan, timing of blood sugar monitoring, management of complications, medication adjustment, and dietary advice with practical tips

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'Pocket Group' Educational Lectures

Patient attending the UiTM diabetes and endocrine clinics were divided into small groups of between eight to ten participants each, stratified depending on their appointment time. The members of the group were educated on the handling and management of diabetes during fasting through a series of lectures delivered by medical professionals – comprising of physicians and endocrinologists. This was enabled by utilizing audio and video presentation modules to facilitate better understanding among patients and care-givers, followed by a brief question and answer session. The lectures addressed issues largely encountered by people with diabetes fasting in the month of Ramadhan, focusing mainly on the dietary aspects encompassing dietary modification, optimal nutritional adjustment during iftar, suhoor and timing of snacks with an overview on calorie and carbohydrate adjustment to medications. In addition, the lectures also emphasized on monitoring blood sugar levels during fasting, and medication adjustment.

Personalized Risk Stratification with Specialized Medical Guidance

Subsequently, each patient had an individualized consultation with an appointed specialist from the endocrine team, where they had a risk calculation of fasting in Ramadhan and further explanation on managing diabetes during the fasting month. The risk of fasting was calculated based on the International Diabetes Federation – Diabetes in Ramadan (IDF-DAR) practical guideline (IDF, 2021), where the personalized score was categorized into high, moderate and low risk of fasting in Ramadhan. The participants were taught the optimal timing for monitoring their blood sugar levels with contingency strategies. They even received instruction on recognizing the complications, especially symptoms of low blood sugar and the prescribed action plan. They were also acquainted with situations where they would have to break their fast and the reasons for doing so. The patients were then given detailed information on management of their medications during fasting, ranging from the timing to titration.

The medical guidance was inclusive of advice on lifestyle modification. The participants received customized information on dietary recommendations and judicious physical activity endorsed during the month of Ramadhan. Further avenues of assistance were provided for the patients to communicate with the diabetic educators during the fasting month if required.

Reference Guide

This whole education process was facilitated by a booklet, which was designed and produced specially for this program. This compendium was fashioned mainly in the Malay language to enable better understanding in the local population. This guide detailed essential knowledge on fasting in Ramadhan for people with diabetes, starting off with describing the challenges encountered by people with DM fasting in Ramadhan and the possible complications, and going on to detail approaches and approved steps in management. This guide was then divided into a few categories, comprising of: the population at high risk for continuous fasting, complications and symptoms with medication titration (Figure 1), and adequate and timing of blood sugar monitoring with dietary tips (Figure 2).

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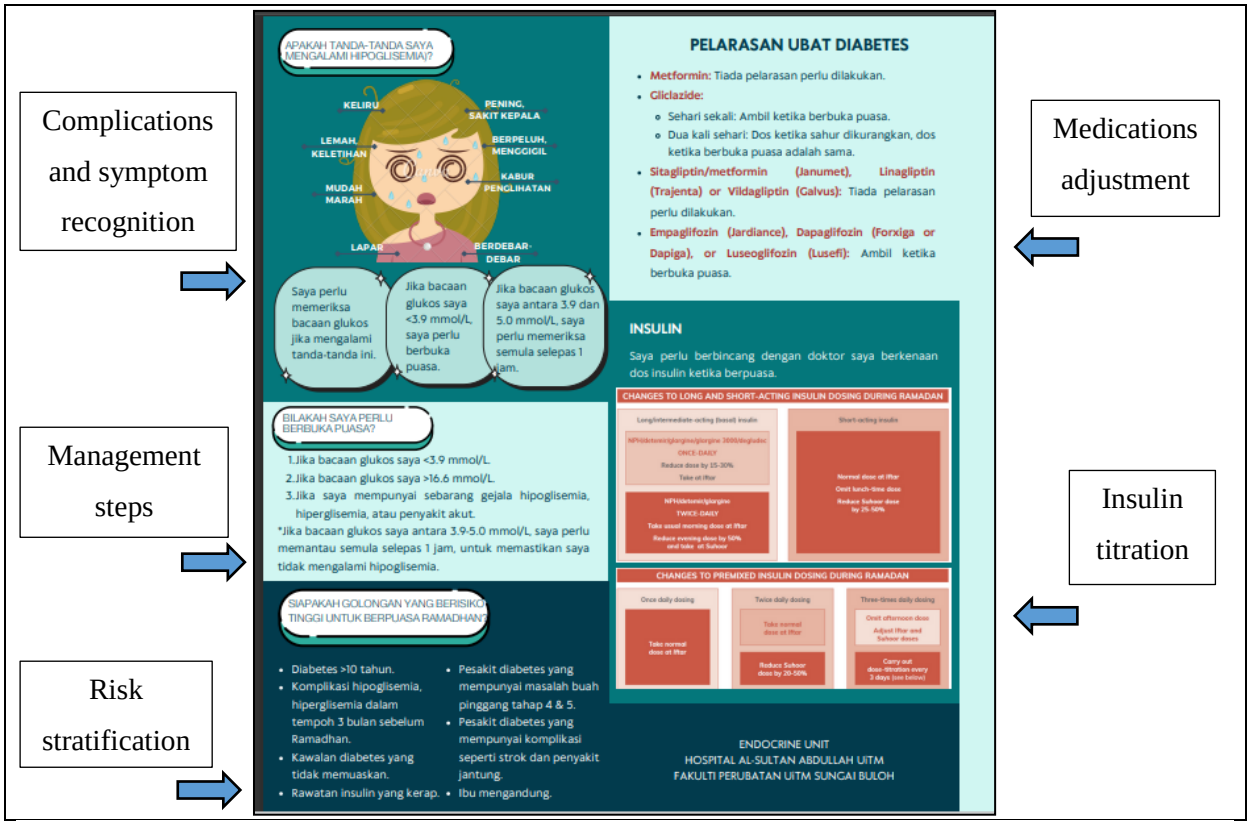

Figure 1: Pages from The Reference Guide – Risk Factors, Symptoms and Complications, with Medication Titration

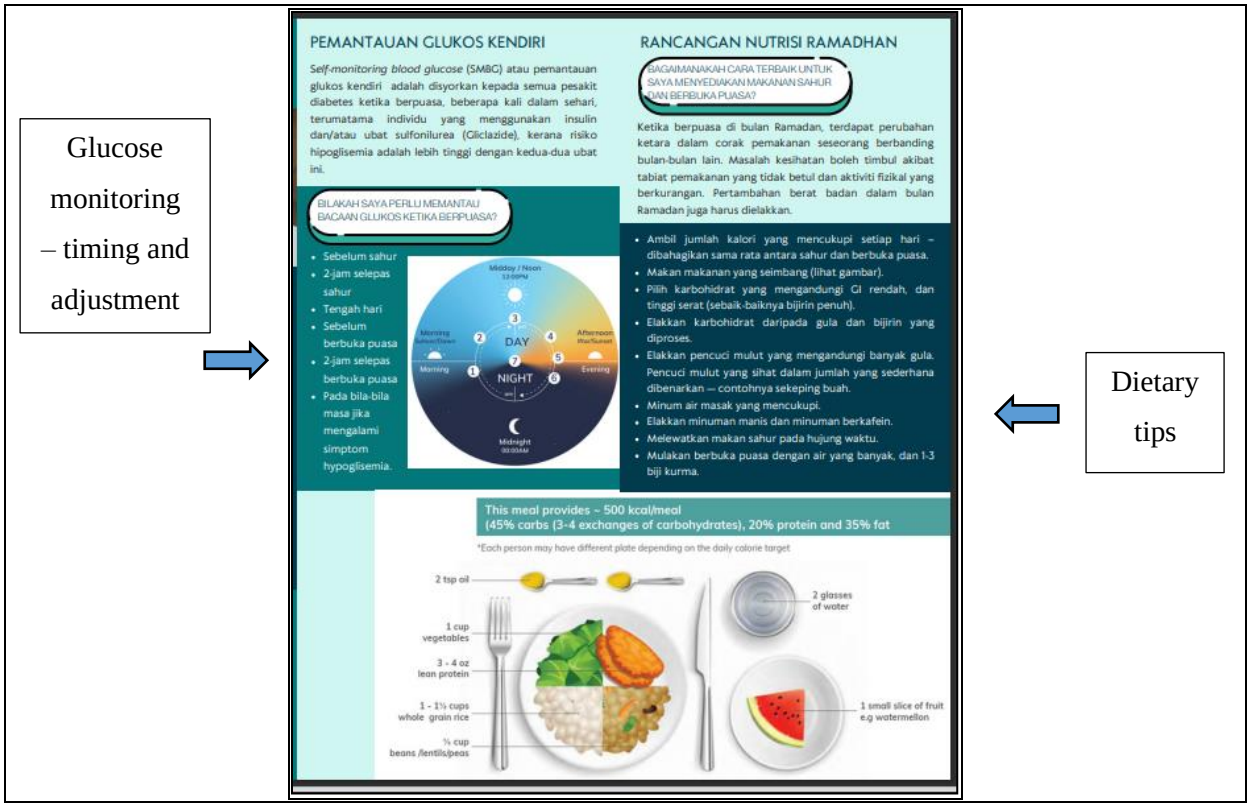

Figure 2: Pages from The Reference Guide – Monitoring Blood Glucose and Dietary Tips

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Program Completion

This program attracted more than 120 participants, and was well received with positive feedback from the attendees. The main benefits derived from this program was seen through better understanding of glycaemic monitoring and dietary modification, leading to improved fasting experience. In essence, this fulfilled the objectives of this program, specifically; optimizing knowledge attainment, reducing complications and facilitating safe fasting during Ramadhan. Additionally, among the encouraging feedback was the ability to manage medications better due to enhanced ability to monitor blood sugar and titrate treatment accordingly, leading to better self-management practices.

As evidenced by this program, a multifaceted diabetes in Ramadhan educational activity is essential in increasing awareness and improving diabetes control during fasting. This program utilized a cohesive structure of integrated diabetes management, with a team consisting of physicians, endocrinologists, diabetic educators and dietitians. This innovative program has contributed hugely in enhancing compliance to medication and dietary practices during the fasting month, and hence enabled participants to maximize the benefits of fasting while minimizing the risks.

Recognizing the significant contribution of a program emphasizing safe fasting for people with DM in Ramadhan, future projections for such events seems vital for promoting health and well-being in this population. Hence, to provide a greater impact, a recommendation is crucial for a similar comprehensive program that can be translated to a larger group of participants, with multi-centre engagement, involving primary, secondary and tertiary medical care centres. It will also be necessary to provide adequate training to the relevant healthcare providers, including medical officers, physicians, diabetic educators and support staff for better knowledge dissemination and improved patient care. Access to a larger group of trained health-care providers aims to facilitate more widespread DM in Ramadhan education programs in many centres across the nation.

Conclusion

This novel and innovative diabetes in Ramadhan patient education program was specially designed for better management of diabetes for patients fasting in the month of Ramadhan. It provides an essential service and aims to fill the gap in crucial knowledge dissemination that is urgently required in this country. The substantial contribution from this program is evidenced by more optimal fasting practices for people with DM and improved health outcomes. This comprehensive and engaging program has been tailored to local specifications with potential for multi-centre engagement, as well as to enable patient empowerment and pave the way to fasting safely.

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