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The effect of Ramadan focused education on patients with type 2 diabetes: About a tertiary center experience

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Abstract

Background: Diabetes is a major public health problem worldwide, it will be the 7th leading cause of death in the world in 10 years. However, fasting, which is one of the pillars of our Muslim religion, represents a major challenge for people with diabetes mellitus, predisposing them to several risk such as hypoglycemia, hyperglycemia and dehydration, hence the need for good therapeutic education and support for diabetic patients to ensure a fast without incidents.

Objective: The objective of this work is to describe the therapeutic education and support program for type 2 diabetic patients during the month of Ramadan, and the evaluation of the impact of this program on the management of diabetic patients during this month.

Materials and methods: The study is a prospective cross-sectional study over a period of 3 months from April 2019 to July 2019, involving 176 type 2 diabetic patients followed at the endocrinology department of Mohammed VI University Hospital in Marrakech or referred from the general medicine consultation, and who have benefited from the therapeutic education program including an interview, a clinical examination, a biological assessment, a cardiology consultation, an ophthalmology consultation, an impedancemetry analysis and an educational session.

Results: Our series includes a total of 176 patients, 72.7% of whom are women and 27.3% are men, with an average age of 58 years. The majority of the patients are out of school with an average duration of type 2 diabetes of 8 years. The most frequent comorbidity is hypertension, with a mean HBA1C of 9.3% for all patients. Patient management was based on drug therapy, 11 patients were treated with dietary hygiene measures, 98 patient with ADO, 40 patients with insulin therapy, 26 with combined ADO and Insulin and 1 with GLP-1 analogue. Among the complications of diabetes detected, 40 patients had evidence of diabetic retinopathy. After risk stratification, 81 patients were authorized to fast, while 95 patients were classified as non-fasting patients. After Ramadan, the patients in our study were summoned, the fasting patients improved their blood sugar control, the occurrence of hypoglycemic episodes was observed in 25% of the patients, the majority of which managed their hypoglycemia well, while fasting blood sugar control was respected in the majority of patients. 67% of non-fasting patients complied with the decision to prohibit fasting. However, all patients reported that they found the therapeutic education pathway useful.

Keywords: Type 2 diabetes; Fasting; Therapeutic education; Risk stratification

1. Introduction

Diabetes is a major public health problem worldwide; it would be the 7th leading cause of death worldwide in 10 years. However, fasting, which is one of the pillars of our Muslim religion, represents a major challenge for diabetics by

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predisposing them to several risks, hence the need for good therapeutic education and support in order to ensure a fasting month without incidents.

2. Material and methods

This was a prospective cross-sectional study spread over a period of 3 months from the month of Sha'ban to the month of Shawal 1443 including the month of Ramadan of the same year, that is to say from April 2019 to July 2019, with the aim to describe and evaluate the program of therapeutic education and accompaniment of the diabetic patient during the month of Ramadan, carried out in the Endocrinology, Diabetology, Metabolic Diseases and Nutrition Department of the Mohammed VI University Hospital Center (CHU).

We collected socio-demographic data (age, sex, education level, professional status and origin), anthropometric parameters (weight, height, BMI) and comorbidities associated with diabetes, as well as data from the cardiological and ophthalmological consultation.

The biological data studied are the lipid profil (LDL, HDL, TG and CT), the glycemic control (fasting blood glucose and HbA1c) and renal assessment (urea, creatinine).

Body fat was assessed using a leg-to-leg bioelectrical impedance device: TANITA MC-980 body composition analyzer (TANITA Corporation, Tokyo, Japan).

3. Results

We included 176 type 2 diabetic patients, with an average age of 58 ± 8.1 years, ranging from 28 to 80 years with a predominance of women: 128 women (72.7%) versus 48 men (27.3%).

The average duration of diabetes in our study was 8.9 ± 7.2 years. In our study, 60% of patients (n=107) had a comorbidity with diabetes. The notion of arterial hypertension (AH), dyslipidemia and dysthyroidism were investigated.

The average HbA1C was 9.3%. Among our patients, 56% were treated with oral anti-hyperglycemic agents alone, and 23% were treated with insulin therapy.

All our patients had a fundus examination and an ocular tonus measurement during the station for the ophthalmological consultation.

Among our 176 patients, 40 patients (22%) had signs of diabetic retinopathy and additional retinal angiography was requested. All our patients had a cardiovascular examination and an electrocardiogram (ECG) during the station for the cardiological consultation.15 patients (8%) had electrical disorders on the ECG, a complementary Trans thoracic echography (TTE) was requested in most cases.

According to the above results, the physicians participating in the therapeutic education program had stratified the risk of fasting for each patient. As a result, the patients in our study were divided into two groups (Figure 1):

- Patients who were allowed to fast: Fasting patients, their number was 81diebetics (46%)
- Patients who were not allowed to fast, their number was 95 diabetics (54%)

Fasting patients improved their glycemic control during the month of Ramadan, HbA1c was reduced from 7.08% before Ramadan to 6% after Ramadan.

There was a significant reduction in body weight (before Ramadan: 76.85 ± 11.3 VS. 76.2kg ± 12.8 after Ramadan), body fat (before Ramadan: 28.4kg +/- 7.2 VS 26.7kg+/- 6.8 after Ramadan), and visceral fat (before Ramadan: 10.41kg +/- 3.3 VS 9.95kg+/- 3.2 after Ramadan).

The diabetic patients participating in our study were satisfied with our health action, and the results of this program were positive bringing a great contribution for type 2 diabetics in the matter of fasting during the month of Ramadan.

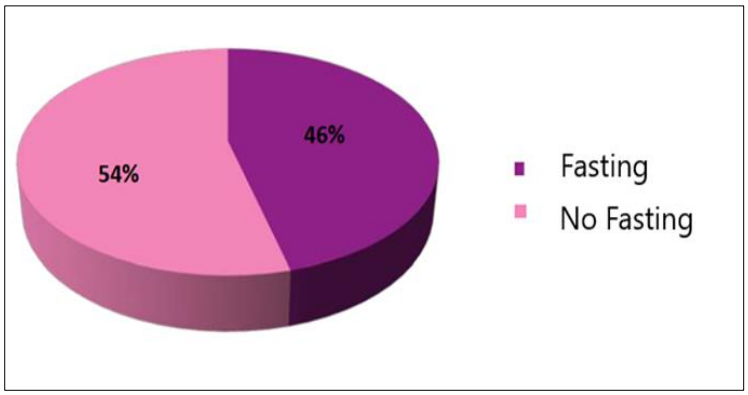

Figure 1 Fasting and No Fasting groups after Risk Stratification

4. Discussion

The fasting of Ramadan represents indeed a real challenge for the diabetic patient considering the potentially serious risks that it can generate, the main ones being hypoglycemia, hyperglycemia, dehydration and thrombosis. Diabetic patients are therefore faced with a dilemma: to fast or not to fast? (1, 2).

It is crucial to ensure optimal care for the many people with diabetes who fast during Ramadan. The International Diabetes Federation (IDF) and Ramadan Alliance Diabetes (DAR) have come together to provide comprehensive guidance on this topic. The IDF-DAR practice guidelines provide healthcare professionals with relevant background information and practical recommendations for health professionals to help people with diabetes participate in fasting during Ramadan while minimizing the risk of complications (3, 4).

In 2007, the National Authority for Health (HAS) adopted the World Health Organization definition of therapeutic education: "The therapeutic education aims to help patients acquire or maintain the skills they need to manage their lives with a chronic disease" . Educational programs can be organized as group sessions or individual consultations, presented by physicians, dieticians and/or health care personnel. (5,6,7,8)

The major areas of diabetes education that should be discussed are (3, 4):

- Risk stratification (Table 1).
- Self-monitoring of blood glucose
- The dietary regimen
- Physical exercise
- Therapeutic adjustment
- When to break the fast

Fasting causes several metabolic changes in the human body, In our series, fasting patients improved their HBA1C during the month of Ramadan, the average rate was reduced from 7.08 ± 1.38% before Ramadan to 6 ± 1.27% after Ramadan in fasting patients, which agrees with the series of Khatib et al (9), Maislos et al (10).

On the contrary, Uysal et al (11) , Lee et al (12) report a significant increase (0.1% and 0.2% respectively) of HbA1c after Ramadan. Finally, Laajam et al (13) did not note any change in HbA1c.

And to determine the impact of therapeutic education in pre-Ramadan on glycemic control, the study by McEwen et al (14) , and Jamoussi et al (15) compared glycemic control for patients who received therapeutic education (Group 1), with those who did not (Group 2), and found an improvement of HBA1c in patients in the first group compared to the second group, which is in line with our study that found an improvement in HBA1c after the therapeutic education program.

Table 1 Risk stratification of Fasting Risk according to IDF-DAR

Risk Stratification IDF- DAR	**Comorbidities and diabetic caracteristics**	**Recommendations**
Low/Moderate Risk	Well-controlled type 2 diabetes treated with: • Hygienic and dietary measures (HDM) • Metformin • Acarbose • Thiazolidinediones • 2nd generation sulfonylureas • Incretins • SGLT2 inhibitors • Basal Insulin	The decision to fast must be shared between the physician and the patient Fasting patients should: • Have a good therapeutic education • Monitor their blood sugar regularly • Undergo a treatment adjustment • according to the recommendations
High Risk	• Type 1 diabetes well controlled • Type 2 diabetes poorly controlled • Type 2 diabetes on mixed or multiple doses of insulin • Pregnant woman with type 2 diabetes2 or gestational diabetes treated with metformin or MHD • Stage 3 renal failure • Stable macrovascular complications • Comorbidity leading to additional risk • Intense physical activity • Concomitant treatment that alters the cognition	The patient should not fast If the patient fasts, they must: • Receive a structured education • To be followed by a team of doctors • Check their blood sugar levels regularly • Adjust their medication dose as recommended • Be prepared to act appropriately in the event of hypo- or hyperglycemia • Be prepared to stop fasting • in case of hypo- or hyperglycemia or aggravation
Very high Risk	• Poorly controlled type 1 diabetes Unexplained severe hypoglycemia, acidotic decompensation, or hyperosmolar coma< 3 months prior to fasting History of recurrent or asymptomatic hypoglycemia Acute overt illness • Pregnant woman with known diabetes or gestational diabetes on insulin or sulfonylurea Stage 4-5 renal failure Advanced macrovascular complications	• The patient must not practice fasting in Ramadan under any circumstances • If the patient fasts, the same recommendations as for high-risk stratified patients (above) should be followed

5. Conclusion

We wish through this study to demonstrate the importance of therapeutic education program in the management of type 2 diabetes during the fasting period, as well as its important role in the prevention of complications and risks related to diabetes during Ramadan, but also to determine the effect and impact of fasting on body composition and glycemic control of fasting diabetic patients, as well as the changes in lifestyle that it generates.

Limitations of the study

- Limitations of our study include the small sample size of patients summoned after Ramadan, the statistical power is limited, which calls for further studies to verify the significance of the required data.
- The lack of quantification of physical activity and dietary intake may be considered a bias for this study.

The information collected was based on self-reporting and may have been approximate or erroneous.

Compliance with ethical standards

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Mohammed VI University Hospital Center.

Disclosure of conflict of interest

No conflict of interest.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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