

PRE-RAMADAN COUNSELING AMONG TYPE TWO DIABETIC PATIENTS WHO DECIDED TO FAST RAMADAN

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ABSTRACT

Background: Ramadhan is the fasting month among the Muslim population, and fasting is one of the five pillars of the Islamic religion. During Ramadhan, there is a major change in the meal times, which significantly affects the body's metabolism and hydration status, increasing the risk of hyper and hypoglycemia in diabetic patients. Probably Pre-Ramadan counseling will improve the rate of these complications.

Patients and methods: This is a prospective cross-sectional study, which included 307 Muslim patients with type 2 diabetes mellitus who decided to fast Ramadan during 2019 in two cities in the Kurdistan region of Iraq. Participants were categorized based on whether they had pre-Ramadan counseling or not.

Results: The mean age of our patients was 55.24, and 71% of patients were females; the mean duration of diabetes mellitus was 80.76 months. Most patients enrolled in this study fasted the whole month (the mean was 26.86 days). Less than 20% had pre-Ramadhan counseling. The majority of patients were not ready to break the fasting (61.6%). Hypoglycemic attacks were less common in patients who had undergone pre-Ramadan counseling (p-value 0.006). There was also no significant correlation of pre-Ramadan counseling with the level of HbA1c (p-value 0.401); however, there was a significant correlation of pre-Ramadan counseling with both serum cholesterol, serum LDL, and hypoglycemic attacks (p values 0.13, 0.002, and 0.006), respectively, with no any significant correlation with triglycerides and HDL levels (p values 0.687 and 0.698) respectively.

Conclusion: Pre-Ramadan counseling is very vital for diabetic patients who decided to fast Ramadan. Pre-Ramadan counseling is a good tool to inform patients about if they are fit to fast or not, the likelihood of complications during Ramadan, and how to manage them (principles of self-management). We recommend a structured diabetes education to decrease the attacks of hypoglycemia. A patient will know when to monitor his/her blood sugar and when to breakfasting.

Will know when to exercise, when to monitor his/her blood sugar and when to breakfasting.

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Keywords: Type two diabetic, Fasting, Ramadan

R amadhan is the fasting month among the Muslim population, and fasting is one of the five pillars of Islamic religion and is compulsory on every adult and healthy Muslim. Ramadhan in the nine months according to the lunar calendar.

The timing of Ramadhan is not constant, and it is based on the lunar calendar. The hours of fasting are Variable depending on the geographical location and the timing of the lunar month concerning the seasons^{1,2}. Diabetes mellitus is a chronic and non-

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curable disease. The global incidence is estimated to be around 6.6% among adults between 20–79 years. During Ramadhan, there is a major change in the meal times and the sleeping patterns among Muslims. This greatly affects the body metabolism and the hydration status of the body, which increases the risk of both hyper and hypoglycemia^{3,2}.

Currently, the Islamic population is around 1.5 billion, most of them fast during the holy month of Ramadhan as a duty for all adults. The duration of Ramadhan varies from 29-30 days. During the fast period, they must abstain from drinking, eating, intake of oral drugs, and smoking from predawn to the sunset. After that, there is no restriction on fluids and food or fluid intake till dawn. Most people consume two meals daily during this month, the first one after sunset and the next before dawn. Data from Islamic countries demonstrate that about 45% of patients with type 1 diabetes and 80% of patients with type 2 diabetes fast during Ramadhan³.

Lifestyle modifications and good diabetic control greatly improves the quality of life and decrease the development of complications⁴.

Fasting has many physiological benefits apart from spiritual and community involvement; these include weight control and arrange dietary behaviors⁵.

Certain groups of people are exempted from fasting during Ramadhan either temporarily or permanently; these include the sick people with chronic illnesses and those with chronic drug usage when fasting have a major impact on the outcome of the disease, other groups of people who are exempted from fasting are those who have traveled to long

destinations and sometimes nursing mothers¹.

Patients usually ask for advice against fasting and the best dietary regimen; the best timing of consultation is within 6-8 weeks from the fasting month; during the consultation, patients are educated about the safety of fasting and modifying drug regimens. Also, they should be educated about the importance of knowing when to breakfasting and when to exercise the importance of home blood glucose checking and dairy during Ramadhan. Patients should be informed about the emergencies associated with fasting and should have some management principles^{1,6,7}.

Although many studies are available concerning diabetes and fasting during Ramadhan, there are currently no standard guidelines for managing diabetic patients during Ramadhan. This article will focus on the effect and importance of pre-Ramadhan counseling for diabetic patients. Patients and methods:

Study design and sampling:

This is a prospective cross-sectional study, which included 307 Muslim patients with type 2 D.M., who decided to fast Ramadan during 2019 who were enrolled randomly in the study. Some patients fasted the whole month while others for some days. Data were collected from patients in 2 cities. About 122 patients were from Duhok city in Azadi Teaching Hospital and 185 patients from Erbil city in Rizgary Teaching Hospital, Kurdistan region of Iraq. Patients were included consecutively. All patients who participated in this study signed informed consent to have their data collected for research purposes. This study was approved by the Duhok General

Directorate of Health Ethics Committee. Participants were categorized on the basis of whether they had pre-Ramadan counseling or not. Patients who refused to be enrolled in the study or those who skipped from follow-up were excluded.

Blood sampling: About 5ml of venous blood were collected by the standard procedure from each patient under complete aseptic conditions in the afternoon, 2.5 ml were placed in lithium heparin test tube, serum was obtained by low-speed centrifugation, after separation the serum samples were stored at 2 – 8 0C and then used for biochemical analysis. The other 2.5 ml were placed in EDTA test tube and used for HbA1c analysis.

Statistical analyses: Descriptive data are displayed in frequencies and percentages

for the categorical variables and mean and standard deviation for continuous variables. Associations between the data is done using the linear regression test. The *p*-value of less than 0.05 is considered significant. Data are analyzed using the Statistical Package for Social Sciences (SPSS 25 IBM: USA).

RESULTS

The mean age of our patients was 55.24, and 71% of patients were females; the mean duration of diabetes mellitus was 80.76 months. Most patients enrolled in this study fasted the whole month (the mean was 26.86 days). The majority of patients were not ready to break the fasting (61.6%) Table 1.

Table 1: Showing the characteristics of the participants.

Main category	Subcategories	Frequency	Percentage
Age: M; SD Range 19-87		55.24	11.298
Sex	Male	89	29
	Female	218	71
Duration of D.M. in months: M; SD Range: 6-528		80.76	69.647
OHA (removing G)	Single drug	134	43.6
	Combination of OHA	173	56.4
BMI: M; SD Range: 17-41		29.18	4.851
Days being fast: M; SD Range: 3-30		26.86	6.967
Fast in Shawal	Yes	44	14.3
	No	261	85.0
Ready to breakfast	Yes	118	38.4
	No	189	61.6

PRE-RAMADAN COUNSELING AMONG TYPE TWO DIABETIC

The vast majority (80%) of patients had no pre-Ramadhan counseling, while less than 20% had the counseling Figure 1.

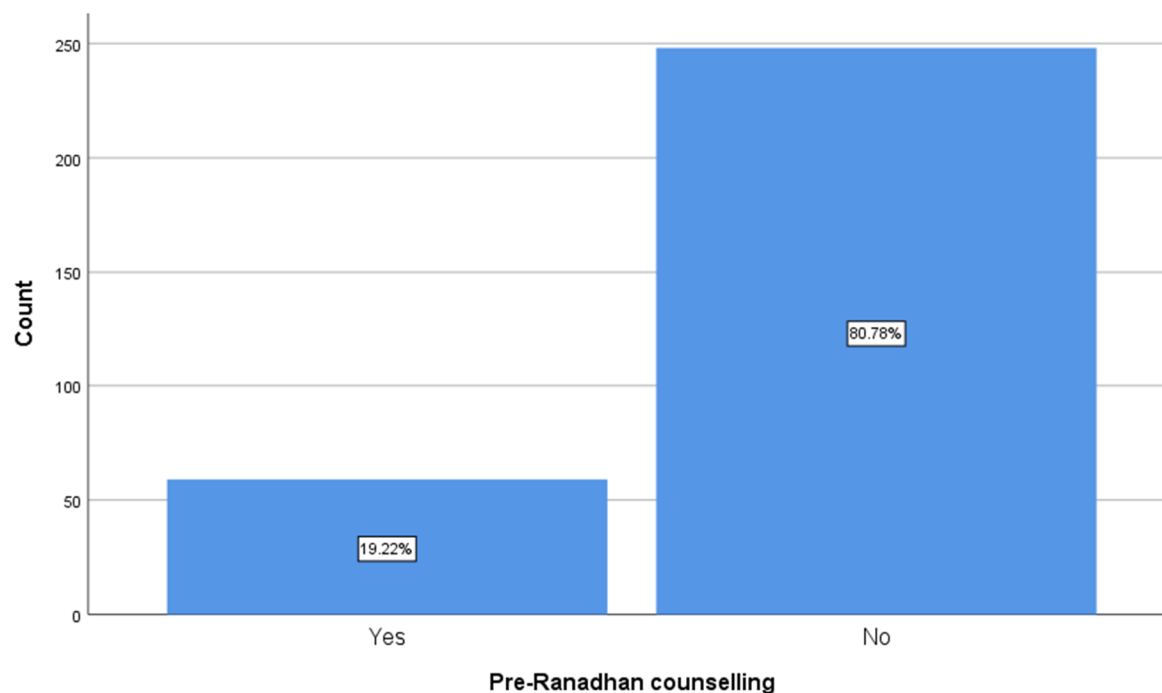


Figure 1: A simple bar chart demonstrating pre-Ramadhan counseling.

The mean level of HbA1c for our patients was 7.92, and levels of serum T.G. was 188.31 mg/dl, serum cholesterol was 181.66 mg/dl, serum LDL level was 103.71 mg/dl, and serum HDL level was

47.17 mg/dl. About 85.7% of our patients needed insulin due to elevated blood glucose levels Table 2.

Table 2: Showing the glyceic control, need for insulin, and the lipid profiles of the participants.

Main category	Subcategories	Mean	Standard deviation
HbA1c			
Range: 5-14		7.9247	1.67236
TG level			
Range: 41-642		188.31	95.957
Cholesterol level			
Range:92-350		181.66	43.956
LDL level			
Range: 22-208		103.71	34.805
HDL level			
Range: 20-102		47.17	10.940
Need for insulin (F, %)	No	263	85.7
	Yes	44	14.3

The correlations were done using the unpaired t-test for the equality of variances and the logistic regression tests. There was a significant correlation between pre-Ramadhan counseling and each cholesterol level, LDL level, and the development of hypoglycemia (p -values 0.013, 0.002, and

0.006), respectively. Other data such as HbA1c, triglyceride level, HDL level, and insulin requirement showed no significant correlation. At the same time, hypoglycemic attacks were less common in patients who had undergone pre-Ramadhan counseling (Tables 3 and 4).

Table 3: Showing the relation of pre-Ramadhan counseling to different parameters using the unpaired t-test.

Predictors	Unpaired t-test for Equality of Means				
	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Need for insulin	.525	.032	.051	-.068	.133
Hypoglycemic attacks	.005	.725	.256	.220	1.230
HbA1c	.138	-47.239%	31.776%	-109.766%	15.289%
TG level	.593	7.447	13.916	-19.936	34.830
Cholesterol level	.615	3.214	6.375	-9.330	15.758
LDL level	.037	-10.484	5.014	-20.351	-.618
HDL level	.545	.961	1.586	-2.160	4.083

Table 4: Showing the relation of pre-Ramadhan counseling to different parameters using the logistic regression test.

Categories	B	S.E.	Wald	df	Sig.	Exp(B)
Hypoglycemic attacks	-.210	.076	7.681	1	.006	.811
HbA1c	.091	.109	.706	1	.401	1.096
TG level	-.001	.002	.162	1	.687	.999
Cholesterol level	-.013	.005	6.103	1	.013	.987
LDL level	.020	.006	9.693	1	.002	1.020
HDL level	-.006	.015	.151	1	.698	.994
Need for insulin	.263	.486	.291	1	.589	1.300
Constant	1.322	1.260	1.101	1	.294	3.752

a. Variable(s) entered on step 1: Hypoglycemic attacks, HbA1c, TG level, Cholesterol level, LDL level, HDL level, Need for insulin.

DISCUSSION

Fasting during Ramadhan is a significant medical challenge for both doctors and the patients themselves. About 50 million diabetic Muslims fast during the holy

month of Ramadhan. Fasting is not an obligatory duty on patients because they had the permission to eat according to holy Quran statements; however, most of them insist to fast during Ramadhan³.

The fasting month of Ramadhan follows the lunar calendar, and this means that it is brought forward 10 days each year. Fasting during wintertime and when the day is short is considered to be easier when compared to fasting in the summertime and longer days^{8,2}.

Generally, fasting during Ramadhan is recommended for patients with well-controlled type 2 diabetes mellitus who are aware of the disease; for patients with type 1 diabetes, it is recommended generally to not fast; if they insist, then patients should make good glycemic control and frequent daily check of blood sugar⁹.

Many studies compared the biochemical effects between normal individuals and diabetic patients that occur in the body during the fasting state. Most of them concluded that very little change occurs in glycemic levels, lipids, and body weight. In the current study, we found a significant correlation between fasting state and the levels of cholesterol and LDL lipoproteins, especially in those patients with pre-Ramadhan counseling^{4,3}.

In our study, the majority of the participants were overweight (mean BMI: 29.18); however, most studies indicate that fasting during Ramadhan has no major impact on body weight^{10,11}.

Some patients are considered to be risky during fasting, particularly those who had attacks of hypoglycemia during the last three months before Ramadhan, frequent attacks of hypoglycemia, patient unawareness about hypoglycemia and complications, patients with a high level of physical activity, pregnancy, old ages, angiopathy, patients who live alone and those with end-stage renal disease¹.

In our study, there was no significant increase in the levels of blood glucose. Most patients have a mild increase in the levels of HbA1c; only 14.3 % of the involved patients needed insulin for reduction of the blood glucose level. There was no significant correlation between the level of HbA1c and the need for insulin (p values= 0.401 and 0.589), respectively. At the same time, our study also shows the hypoglycemic attacks were less common in patients who had undergone pre-Ramadhan counseling (p -value 0.006); some authors found that fasting worsens the levels of blood glucose among diabetic patients^{9,12,13}.

The dose of insulin and oral hypoglycemic drugs need modification during fasting; in patients with type 1 diabetes, the use of pumped insulin therapy may result in better diabetic control and less frequent attacks of both hypo and hyperglycemia. In our study, 43.6 % of patients were on single oral hypoglycemic drugs, and 56.4% were on a combination of 2 drugs⁵. Many international consensus meetings were held to put guidelines for diabetic patients; some recommendations were put against fasting such as in patients with new-onset diabetes, patients with type 1 diabetes, patients with unstable disease, non-compliant patients, patients with complications or pregnant ladies, elderly patients, mentally unstable diabetic patients, patients with two or more attacks of hypoglycemia during previous months and patients with unstable epilepsy^{4,1}.

Fasting had been shown to lower the levels of both cholesterol and triglycerides; in our patients, there was a significant correlation with both serum cholesterol and LDL levels (p =values 0.13 and 0.002),

respectively, while there was not any significant correlation with the serum triglycerides and HDL levels (p values 0.687 and 0.698) respectively^{14,11,15,16}.

Pre-Ramadan counseling is very vital for diabetic patients as it shows less incidence of complications, including hypoglycemia, as shown in our study, that is why in some centers, there are medical leaflets that contain many educational instructions, these may be given to the patients during the counseling before the start of the fasting month. These may include learning about the warning signs of both hyper and hypoglycemia, the benefits of mild to moderate physical activities, avoiding overeating while breaking the fasting, and sweets must be avoided. It is better to measure the blood glucose level before and 2 hours after eating. At the end of each Ramadhan, patients' records should be discussed with the diabetic physician and nutritionist^{1,17,18}.

CONCLUSION

Pre-Ramadan counseling is very vital for diabetic patients who decided to fast Ramadan. Pre-Ramadan counseling is a good tool to educate the patient about if they are fit to fast or not, the likelihood of complications during Ramadan, and how to manage them (principles of self-management). We recommend a structured diabetes education to decrease the attacks of hypoglycemia and decrease the levels of cholesterol. The patient will know when to monitor his/her blood sugar and when to breakfasting.

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پوخته

راویژ کاریا پیشییا ههیفارهمهزانا پیروژ بو نهخوشن نیشا شهکر - جور - 2 بین بریار داین کو روژیان بگرن

پیشهکی: ههیفارهمهزانا پیروژ دهیته دانان ههیفار روژیگرتنی لدهف موسلمانان، روژی نیک ژ ستوینن ئابینی ئیسلامی یه ، لقی ههیفی دا گهلهک گهورین دکهفته ژهمیت خوارنی و بهایی خوراکي بی هه ژمهکی و ریژا شلهی ناقا لهشی مروقی دا، کو دبیه نهگهري زیدهبوونا مهنرسیا توشبوونی بزیده یان کیم بوونا ریژا شهکر لجه نهخوشان ، دهیته پیشینی کرن کو راویژکاری پیش مانگا رهمهزانا پیروژ دبیه نهگهري کیم بوونا ریژا قان لی پیس کرنان.

نهخوش و ریکیت چارهسهري: ئەف قهکولینا پیشینی یا بهاری 307 نهخوشین شهکر بین بریار داین کو روژیان بگرن لسا 2019 بخوچه گرتیه ل 2 شاران لهههريما کوردستانی و نهخوش هاتینه ژیک جوداکرن لسه بنیاتی راویژکاری بهری دهسپیکرنا ههیفارهمهزانا پیروژ.

نهجام: ناقنجیا ژبی نهخوشان 55.24 بوو و بریژا 71% ئافرهت بوون، ههروهسا ناقنجیا دهمی توشبوونی ب نهخوشیا شهکر 80.76 ههیفبوون ، ریژا مهزن ژ نهخوشان بین ناقی خو لقی قهکولینی تومار کری روژی گرتن (بریژا ناقجی 26.86 روژ) کیمتر ژ 20% ژ نهخوشان راویژکاری کر پیشییا رهمهزانا پیروژ ، ههروهسا ریژا مهزن ژ نهخوشان روژیان خو تمام کر بوون بریژا 61.1%، ریژا توشبوونی ب کیم بوونا ریژا شهکر لجه نهخوشین راویژکاری کری کیمتر بو ژ نهخوشین دی (بهایی نهگهري 0.006) ، ههروهسا چ ههقیهیهوهندیهکا گریدای دناقبره راویژکاری پیشییا ههیفارهمهزانا پیروژ و ریژا HbA1c نهبوو (ریژا نهگهري 0.401). بهلی ههقیهیهوهندیهکا گریدای دناقبره راویژکاری پیشییا ههیفارهمهزانا پیروژ و ریژا کولسترولی دناق خوینی دا (LDL) دگهل بهرینین شهکر لناق خوینی دا (0.13) ، 0.002 و 0.006 ریژا نهگهري) ل دویف نیک بیی کو ههقیهیهوهندیهکا گریدای ههبیته دگهل ریژا چهوریته سییانهی و (HDL) (0.687 p و 0.698 ریژا نهگهري) ل دویف نیک.

دهر نهجام: راویژکاری پزشکی پیشییا ههیفارهمهزانا پیروژ کارهکی گرنگه بو نهخوشین شهکر بین بریار داین کو روژیان بگرن ل ههیفارهمهزانا پیروژ. راویژکاری پزشکی دهیته دانان ریکهکا باش دا کو نهخوش بزانیته که شیانین گرتنا روژیان ههیه یان نه. ههروهسا نهگهري پهیدا بوونا لی پیس کرنا و چاوانییا سههدهری کرنی دگهل دا (بنهمایین ریفهبرنا کهسایهتی). روشنبرکرنا بریکوییک لسه نهخوشیا شهکر دئ بیته نهگهري کو گورانکاری کیمتر لسه کیشا لهشی نهخوشی پهیدا بین ، ههروهسا دئ نهخوش زانیت چ دم وهرزشی بکهت و چ دم چاقدیریا ریژا شهکر لناق خوینی دا بکهت و کهنگی پیتقیه روژییا خو بشکینیت.

الخلاصة

الاستشارة الطبية لمرضى السكري من النوع الثاني قبل رمضان الذين قرروا صوم رمضان

مقدمة: شهر رمضان هو شهر الصوم عند المسلمين ، والصيام من أركان الدين الإسلامي الخمسة. خلال شهر رمضان ، هناك تغيير كبير في أوقات الوجبات مما يؤثر بشكل كبير على التمثيل الغذائي في الجسم ومستوى الماء في الجسم مما يزيد من خطر الإصابة بفرط اونقص مستوى السكر في الدم لدى مرضى الذين يعانون من مرض السكري. من المحتمل أن تؤدي الاستشارة الطبية قبل رمضان إلى الحد من حدوث هذه المضاعفات.

الحالات المرضية والاسلوب المتبع: هذه دراسة الدراسة المستعرضة مرجعية شملت 307 مريضاً مسلماً مصاباً بداء السكري من النوع 2 قرروا صيام رمضان خلال عام 2019 في مدينتين في إقليم كردستان العراق. تم تصنيف المشاركين في هذه الدراسة على أساس ما إذا كان لديهم استشارات طبية قبل رمضان أم ليست لديهم.

النتائج: كان متوسط عمر مرضى 55.24 ، كانت نسبة 71% من المرضى من الإناث ، وكان متوسط مدة الإصابة بالسكري 80.76 شهراً. صام معظم المرضى المسجلين في هذه الدراسة طوال الشهر (بمتوسط 26.86 يوماً). أقل من 20% حصلوا على استشارات قبل رمضان. غالبية المرضى لم يكونوا مستعدين للافطار بنسبة (61.6%). كانت نوبات نقص السكر في الدم أقل شيوعاً لدى المرضى الذين خضعوا للاستشارة الطبية قبل رمضان (0.006 p value). كما لم يكن هناك أي علاقة مترابطة بين الاستشارة الطبية قبل رمضان ومستوى HbA1c (0.401 p value) ، ولكن كان هناك علاقة مترابطة بين الاستشارة الطبية قبل رمضان مع كل من الكوليسترول الكلي في الدم وLDL (وونوبات سكر الدم (p values) 0.13 ، 0.002 و 0.006) على التوالي بدون أي علاقة مترابطة مع مستويات الدهون الثلاثية (HDL) (p values) 0.687 و 0.698) على التوالي.

الخلاصة: الاستشارة الطبية قبل رمضان أمر مهم للغاية لمرضى السكري الذين قرروا صيام شهر رمضان. تعتبر الاستشارة الطبية قبل رمضان طريقة جيدة لإعلام المرضى بما إذا كانوا قادرين على لصيام أم لا ، واحتماليات حدوث مضاعفات خلال هذا شهر وكيفية إدارتها (مبادئ الإدارة الذاتية). سيؤدي التنقيف المنظم عن مرض السكري إلى تغييرات أقل في وزن جسم المرضى ، وسيعرف المريض متى يمارس الرياضة ، ومتى يراقب نسبة السكر في الدم ومتى يجب عليه ان يفطر.