Ramadan fasting with diabetes: An interview study of inpatients’ and general practitioners’ attitudes in the South of France
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Abstract
Aim. – The aim of this study was to evaluate attitudes in hospital inpatients and physicians towards Ramadan fasting and diabetes in Marseille.
Methodology. – This cross-sectional study was conducted during the three months prior to the month of Ramadan. A total of 101 patients (age: 57 ± 17 years) and 101 general practitioners (GPs) were recruited into the study.
Results. – The patients had low levels of education (52% illiteracy). Of the 101 patients, 52 continued to fast during Ramadan, and only 65 patients had discussed the matter with their GP. Of these, 36 were told that fasting was forbidden, but more than half (n = 19) fasted despite the medical advice. Six patients thus experienced daily hypoglycaemia because they had continued to take their hypoglycaemic agent or insulin analogue at noon. Both inadequate education and religious attitudes were found to endanger patients during the fast: 15 patients skipped the meal scheduled before dawn, five of whom persisted in taking their sulphonylurea. Also, 27% of patients refused, in spite of daytime hypoglycaemia, to ingest anything orally to avoid breaking their fast. Among the GP population, medical knowledge of Ramadan fasting with diabetes was low, leading to medically unjustified negative advice for fasting and a lack of patient education on adjusting treatments. This particular situation weakened the patient–physician relationship.
Conclusion. – This study confirms the importance of Ramadan fasting for Muslim patients, and reveals a wide cross-cultural gap between GPs and their patients. Systematic advice on treatment adjustment needs to be given. For this reason, we encourage more sensitive care of these patients and more medical training for physicians.
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Keywords: Ramadan fasting; Diabetes mellitus; Education counseling; Cross-cultural competence

Résumé
Diabète et jeûne du Ramadan : regards croisés patients et médecins généralistes dans le Sud de la France.
Objectif. – Évaluer les attitudes des patients diabétiques et des médecins généralistes (MG) face au jeûne du Ramadan à Marseille.
Méthodes. – Étude transversale menée dans les trois mois précédant le Ramadan chez 101 patients diabétiques musulmans hospitalisés (âge : 57 ± 17) et 101 MG.
Résultats. – Les patients avaient un faible niveau d’études (52 % d’illettrisme) ; 52 pratiquaient le Ramadan chaque année. Soixante cinq patients ont discuté de faire le jeûne avec leur MG. Parmi eux, 36 se sont interdits de jeûner mais 19 ont décidé de jeûner contre l’avis du MG. Six patients ont présenté des hypoglycémiées répétées à midi du fait de la poursuite de leur sulfiamide hypoglycémiant ou de leur insuline rapide pendant le jeûne. Le manque d’éducation thérapeutique ou certains comportements religieux peuvent mettre le patient en danger : cinq patients ont rapporté sauter le repas avant l’aube et prendre leur sulfiamide ; 27 ont déclaré qu’ils refusaient de se resucrer en cas d’hypoglycémie pour ne pas rompre le jeûne. Parmi les 101 MG, les connaissances médicales portant sur le sujet diabète et Ramadan étaient faibles. De ce fait, beaucoup de conseils négatifs étaient donnés sur la pratique du Ramadan et peu d’éducation thérapeutique ou d’ajustement thérapeutique étaient réalisés, fragilisant la relation médecin-malade.

Abbreviations: GP, General practitioner; OAD, Oral antidiabetic drugs.
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**Conclusion.** – Cette étude confirme l’importance du jeûne pour les patients diabétiques musulmans et révèle une barrière transculturelle médecin–malade. Une éducation et une adaptation thérapeutique systématique devraient être réalisées. Nous encourageons la prise en charge spécifique de ces patients et la mise en œuvre de formations médicales sur le Ramadan.

Mots clés : Jeûne du Ramadan ; Diabète ; Éducation thérapeutique ; Compétence inter-culturelle

1. Introduction

As Ramadan fasting is one of the five Pillars of Islam, more than one billion Muslims fast simultaneously worldwide. Observance insists that they refrain from eating and drinking from dawn to sunset during the entire month of Ramadan. Although the Koran exempts the sick from fasting [1], especially if fasting could lead to harmful consequences, Muslim diabetic patients commonly wish to participate and frequently do so. Over the coming decade, Ramadan will fall during the summer months, thus increasing the number of fasting hours and raising the risk of negative effects for diabetic patients wishing to fast [2].

The EPIDIAR study [3], conducted in 13 Islamic countries, was the first retrospective study to provide epidemiological data on diabetic patients who practice Ramadan, and showed that 79% of type 2 diabetics and 43% of type 1 diabetics actually fast during Ramadan. Moreover, this study showed 4.7-fold and 7.5-fold increases in severe hypoglycaemia in type 1 and type 2, respectively, diabetic fasting patients. The practice of Ramadan by diabetics has raised medical concerns for years [4–8]. The American Diabetes Association (ADA) has issued statements on the practice to help clinicians to identify patients at high risk during fasting [9,10]. However, counselling migrant patients on their religious practices is a considerable challenge for healthcare professionals who often have a different religion and language. As a consequence, general practitioners (GPs) may simply prohibit their diabetic patients from fasting, advice that weakens the patient–physician relationship instead of enabling patients to better manage the condition themselves [11].

Disregarding religious beliefs may create a barrier in the global process of cross-cultural therapeutic education. Whether diabetic Muslim patients ask their physicians about fasting and follow their medical advice is unknown. The reasons used by GPs to convince their patients not to fast are also of interest and may involve cultural beliefs.

In this context, the present study evaluated the attitudes and practices of patients and GPs towards Ramadan fasting in the ‘real world’ setting of the south of France to invite an open dialogue on the topic, and to obtain a dataset of patients’ and physicians’ opinions on the matter. Indeed, Marseille is a crossover point between France and North Africa, and is host to a diverse religious population, including a large number of Muslim migrants. The aim of this study was to better understand the cross-cultural patient–physician relationship concerning Ramadan practice to improve the medical advice given, and to empower Muslim diabetic patients in disease self-management. Thus, two cross-sectional studies were conducted in Marseille, one involving Muslim diabetic patients and the other in GPs not related to the patients to avoid any biased answers.

2. Research design and method

2.1. Study 1: patients’ attitudes and practices

A sample of Muslim diabetic patients was selected from among patients hospitalized for the first time in our department, or in other departments of Marseille’s university hospitals, for reasons related or not to diabetes. All recruited inpatients were living in Marseille or its suburbs. The recruitment period extended over eight weeks in the summer, within the three months prior to Ramadan. All patients gave their informed consent to answer a questionnaire aimed at determining their attitudes towards Ramadan fasting.

For inclusion, patients had to be Muslim with either type 1 or type 2 diabetes and able to reply to an oral questionnaire. Newly diagnosed patients (< 1 year) and patients who had previously received specific counselling in our department were excluded from the study.

2.1.1. Questionnaire

Data collection was obtained from individually held face-to-face interviews between all patients and the same investigator. A standardized questionnaire, comprising 54 open and closed questions, was the basis of the interview, and covered:

- a detailed medical history, including type and duration of diabetes, complications, medical follow-up, drug treatment, autonomy for monitoring capillary blood glucose or insulin injection, level of glycaemic control and frequency of hypo- or hyperglycaemic events during the three months before Ramadan;
- sociodemographic data, such as education level and time since arrival in France;
- questions concerning religious practices, such as daily worship, Mecca pilgrimage, consumption of Halal food;
- Ramadan practise, including history of fasting, source and nature of counselling received that may have influenced their practise (healthcare professionals, religious authorities), adverse events during the fast, changes in food intake, physical activity, treatment and medical follow-up, reasons for prematurely breaking the fast or ending Ramadan fasting and;
- their ability to recognize situations at risk of adverse events, and attitudes towards specific situations such as hypo/hyperglycaemia and pregnancy.
Glycaemic control was also assessed at the time of the interview by measuring HbA1c, using high-performance liquid chromatography (HPLC; normal range: 4–6%). A retrospective analysis of the patients’ risk during Ramadan fasting was assessed from their medical data as defined by ADA recommendations [9,10] (Table S1; see supplementary material associated with this article online).

2.2. Study 2: GPs’ attitudes and practices

A sample of GPs from Marseille and its suburbs who were not related to the patients included in study 1 were also recruited during four randomly selected medical-training sessions that were part of a continuing medical education programme. GPs attending these sessions were invited to participate in the study, and informed that they would be subjected to a written questionnaire dealing with Ramadan fasting in Muslim diabetics.

2.2.1. Questionnaire

The standardized written questionnaire comprised 29 questions, including open questions to avoid suggesting any answers. GPs had a maximum of 30 minutes to complete the questionnaire on site and on their own. The questions specifically covered:

- the location of their general practice, and the self-estimated proportion of Muslim patients and diabetic patients attending their medical practice;
- their knowledge of Ramadan;
- any specific medical training received on issues related to Ramadan;
- their personal beliefs and attitudes towards fasting in diabetic patients, especially whether and how they intended to influence their patients’ decision to fast or not and;
- their practice of providing or not, spontaneously and/or upon request, any specific counselling on Ramadan fasting and, if so, the nature of the counselling provided, such as adjustments to diabetes treatment regimens, and recommendations for diet and physical activity.

3. Statistical analyses

Quantitative data were presented as means ± standard deviation (SD). Qualitative data were expressed as the frequency of valid answers for each modality. In study 2, the physicians filled out the questionnaires on their own and did not necessarily answer every question, so percentages were calculated only with valid answers. Group comparisons for qualitative data were performed using the χ² test (or Fisher’s exact test when validity conditions of the χ² test were not met).

In the inpatients’ study, for some analyses, the participants were divided into two groups: those who continued to practice Ramadan fasting, referred to as the “Fasting” group; and those who had stopped practising Ramadan fasting at the time of the study, referred to as the “Non-Fasting” group. Patients who had never practised Ramadan fasting were excluded from these analyses.

Group comparisons for quantitative data were performed using Student’s t tests, or Mann–Whitney non-parametric tests when appropriate. Survival curves for longitudinal data were performed using the Kaplan–Meier method. Also, 95% confidence intervals (CI) for median survival were computed, and log-rank tests used to compare survival curves. All statistical tests were two-tailed, and the significance level was set at P<0.05.

4. Results

4.1. Study 1: general characteristics of the inpatient population (n = 101)

Only two patients refused to take part in the study. The demographic, religious and clinical characteristics of the study population are shown in Table 1. Patients had been living in France for 35.6 ± 17 years; 99% came from the Mediterranean area and the majority were from Algeria. Their level of education was low: 52% of the patients had never attended primary school and could not read; and 78% of the working people were manual workers. Religious practice was assiduous: 71% of the patients prayed five times a day; 95% consumed Halal food exclusively; and 28% had made a pilgrimage to Mecca at the time of the study.

Overall, 20% were type 1 diabetics and 80% were type 2, and the mean duration of diabetes was 13 ± 8.6 years. Mean HbA1c was 8.6 ± 0.2% (95% CI: 5.3–14.5%), and mean body mass index (BMI) was 27.9 ± 0.6 kg/m². Also, 42% of patients had occasionally been followed-up by a diabetologist. These patients’ ability to manage their diabetes was poor: 16% were unable to monitor their capillary blood glucose; 44% needed a nurse for injecting insulin; and 39% could neither give the name of their insulin(s) or oral treatment(s) nor specify the colour of the drug’s packaging.

4.1.1. Modality for deciding to fast or not

All of the inpatients (n = 101) had discussed the feasibility of fasting with their relatives, but only 65 patients had discussed the matter with their GP, and 25 patients preferred to seek advice from the local Imam. Among those who had discussed the matter with their GP (n = 65), 36 patients were told that fasting was dangerous and forbidden, yet more than half (n = 19) fasted anyway, thus ignoring medical advice, whereas all of the patients who had been counselled by their Imam followed his advice.

Retrospective analysis of the medical data for the 19 patients denied permission to fast by their GP showed that seven patients had exhibited none of the conditions recognized as being high-risk factors for adverse events while fasting, as defined by ADA recommendations [9,10] (Table S1; see supplementary material associated with this article online), thus raising the question of the medical relevance of the prohibition.

4.1.2. Characteristics of the Fasting and Non-Fasting patients

A majority of patients (n = 52) had continued to fast during Ramadan, and made up the Fasting group. However, 40
Table 1
Baseline characteristics of the study population, and comparison of demographic, religious and clinical features of the Fasting and Non-Fasting inpatients.

<table>
<thead>
<tr>
<th>Population (n [%])</th>
<th>Entire population</th>
<th>Fasting group</th>
<th>Non-Fasting group</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (%) Men</td>
<td>101 (46)</td>
<td>52 (50)</td>
<td>40 (35)</td>
<td>0.15</td>
</tr>
<tr>
<td>Age (years)</td>
<td>57.5 ± 17.3</td>
<td>56.4 ± 15.6</td>
<td>64.1 ± 15.1</td>
<td>0.021a</td>
</tr>
<tr>
<td>Diabetes duration (years)</td>
<td>13 ± 8.6</td>
<td>10 ± 8.6</td>
<td>16 ± 8.1</td>
<td>0.002a</td>
</tr>
<tr>
<td>Type of diabetes (n [%])</td>
<td></td>
<td></td>
<td></td>
<td>0.65</td>
</tr>
<tr>
<td>Type 1</td>
<td>20 (19.8)</td>
<td>7 (13.5)</td>
<td>7 (17.5)</td>
<td></td>
</tr>
<tr>
<td>Type 2</td>
<td>81 (80.2)</td>
<td>45 (86.5)</td>
<td>33 (82.5)</td>
<td></td>
</tr>
<tr>
<td>Medical follow-up (n [%])</td>
<td></td>
<td></td>
<td></td>
<td>0.84</td>
</tr>
<tr>
<td>Specialist</td>
<td>42 (42)</td>
<td>21 (40)</td>
<td>17 (42.5)</td>
<td></td>
</tr>
<tr>
<td>General practitioner</td>
<td>59 (58)</td>
<td>31 (60)</td>
<td>23 (57.5)</td>
<td></td>
</tr>
<tr>
<td>Diabetes education (n [%])</td>
<td></td>
<td></td>
<td></td>
<td>0.672</td>
</tr>
<tr>
<td>Inability to monitor blood glucose</td>
<td>16 (16)</td>
<td>8 (15)</td>
<td>7 (17.5)</td>
<td>0.78</td>
</tr>
<tr>
<td>Inability to inject insulin (n = 61)</td>
<td>27 (44)</td>
<td>9 (37.5)</td>
<td>15 (52)</td>
<td>0.3</td>
</tr>
<tr>
<td>Unawareness of treatment name</td>
<td>39 (39)</td>
<td>19 (37)</td>
<td>17 (42.5)</td>
<td>0.61</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>8.6 ± 2.2</td>
<td>8.7 ± 2.3</td>
<td>7.8 ± 1.5</td>
<td>0.035a</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>27.9 ± 5.9</td>
<td>29 ± 5.8</td>
<td>27.4 ± 5.5</td>
<td>0.183</td>
</tr>
<tr>
<td>Time since arrival in France (years)</td>
<td>35.6 ± 17</td>
<td>36.6 ± 17</td>
<td>35 ± 17.4</td>
<td>0.672</td>
</tr>
<tr>
<td>Level of education (n [%])</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiteracy</td>
<td>53 (52)</td>
<td>28 (54)</td>
<td>25 (62)</td>
<td>0.4</td>
</tr>
<tr>
<td>Primary school</td>
<td>4 (0.4)</td>
<td>3 (6)</td>
<td>1 (3)</td>
<td>0.63</td>
</tr>
<tr>
<td>Secondary school</td>
<td>37 (37)</td>
<td>20 (38)</td>
<td>9 (22)</td>
<td>0.1</td>
</tr>
<tr>
<td>Higher education than secondary</td>
<td>6 (0.6)</td>
<td>1 (2)</td>
<td>5 (13)</td>
<td>0.08</td>
</tr>
<tr>
<td>Religious practice (n [%])</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prayer five times a day</td>
<td>72 (71)</td>
<td>46 (88)</td>
<td>24 (60)</td>
<td>0.002a</td>
</tr>
<tr>
<td>Halal food consumption</td>
<td>96 (95)</td>
<td>51 (98)</td>
<td>49 (97)</td>
<td>1</td>
</tr>
<tr>
<td>Mecca pilgrimage</td>
<td>28 (28)</td>
<td>19 (36)</td>
<td>9 (22)</td>
<td>0.15</td>
</tr>
<tr>
<td>Occupation</td>
<td>58 (57)</td>
<td>31 (60)</td>
<td>23 (57)</td>
<td>0.55</td>
</tr>
<tr>
<td>Manual worker</td>
<td>45 (78)</td>
<td>26 (84)</td>
<td>17 (74)</td>
<td>0.5</td>
</tr>
<tr>
<td>Co-morbidities (n [%])</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>55 (54)</td>
<td>27 (52)</td>
<td>27 (67)</td>
<td>0.13</td>
</tr>
<tr>
<td>Dyslipidaemia</td>
<td>38 (38)</td>
<td>17 (33)</td>
<td>21 (52)</td>
<td>0.06</td>
</tr>
<tr>
<td>Treatment (n [%])</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diet</td>
<td>2 (2)</td>
<td>2 (4)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>OAD exclusively</td>
<td>38 (38)</td>
<td>27 (52)</td>
<td>11 (27)</td>
<td></td>
</tr>
<tr>
<td>OAD + insulin</td>
<td>14 (14)</td>
<td>7 (13)</td>
<td>5 (13)</td>
<td></td>
</tr>
<tr>
<td>Insulin only</td>
<td>47 (46)</td>
<td>16 (31)</td>
<td>24 (60)</td>
<td></td>
</tr>
<tr>
<td>Insulin total</td>
<td>61 (44)</td>
<td>23 (44)</td>
<td>29 (73)</td>
<td>0.007b</td>
</tr>
</tbody>
</table>

Quantitative data are shown as means ± SD and qualitative data as percentage of subjects.

a P < 0.05.
b P of difference between patients taking and not taking insulin; OAD: oral antidiabetic drugs.

patients had fasted in the past, but had ceased doing so, and comprised the Non-Fasting group. Nine patients reported never having fasted during Ramadan and so were excluded from any further analyses.

In the Fasting group, patients exhibited significantly higher HbA1c levels at the time of the interview (8.7 ± 2.3% vs 7.8 ± 1.5%; P = 0.035), and were significantly younger (P = 0.021) and had been diabetic for a shorter time than those in the Non-Fasting group (P = 0.002; Table 1). The median time interval between diabetes diagnosis and the decision to permanently forsake the practise of Ramadan fasting was 17 years (95% CI: 13–21 years). After 20 years of diabetes duration, less than 40% of patients (35% type 1 and 65% type 2) had continued to observe Ramadan fasting (Fig. S1A; see supplementary material associated with this article online). In addition, women appeared to have given up fasting sooner than men after the diagnosis of diabetes (P = 0.012; Fig. S1B; see supplementary material associated with this article online).

In addition, the Fasting patients, vs Non-Fasting patients, were more frequently being treated with oral antidiabetic drugs (OADs; 52% vs 28%, respectively; P < 0.001), and were less frequently being treated with insulin (44% vs 72%, respectively; P = 0.007). However, autonomy with their insulin injections did not differ between the two groups (62% vs 48%, respectively; P = 0.30). Also, the percentage of patients with more than one hypoglycaemia per day during the three months prior to Ramadan did not significantly differ in the Fasting vs the Non-Fasting group (17% vs 28%, respectively; P = 0.24).

4.1.1.3. Reasons for ending Ramadan fasting permanently

The patients reported that their primary reasons for stopping Ramadan fasting permanently were recurrent hypoglycaemias (40%), initiation of insulin therapy (15%), occurrence of hyperglycaemias (12.5%), diagnosis of diabetes (7.5%), medical advice (5%), occurrence of a chronic complication of diabetes...
(5%) and performance of strenuous physical work (2.5%). No patient reported the Imam’s advice for ending Ramadan fasting.

4.1.1.4. Conditions associated with a high risk of adverse events during fasting

In the Fasting group, 29 patients had at least one criterion for a high risk of an adverse event, and 58% of these patients had experienced recurrent hypoglycaemias during the three months prior to Ramadan (Table S1). Furthermore, 30% of these patients reported hypoglycaemia unawareness.

Severe complications were frequent (38.5%), and included chronic renal failure \( (n = 5) \), myocardial infarction \( (n = 7) \), stroke \( (n = 4) \) and amputation \( (n = 4) \). Six patients reported having previously observed Ramadan fasting during an ongoing pregnancy.

4.1.1.5. Occurrence of acute metabolic adverse events while fasting

Six fasting patients experienced daily hypoglycaemias in the afternoon because their treatment schedule had not been adequately adjusted. Three patients continued to take hypoglycaemic agents, and two patients continued to inject short-acting insulin analogues at noon during fasting, because they had not been told to stop their treatment or had not been made aware of the risk of hypoglycaemia by not stopping. One patient inappropriately doubled his sulphonylurea dosage at noon in the belief that this would improve night-time glycaemic control. Another patient reported ketoacidosis while fasting during an ongoing pregnancy that had required hospitalization.

4.1.1.6. Inadequate education and religious attitudes likely to be dangerous during fasting

Among the Fasting group, only 50% identified insulin as a potentially dangerous treatment during daytime fasting, and 81% of patients treated with insulin failed to adjust their insulin dosage during Ramadan. Similarly, only 43% of patients treated with at least one hypoglycaemic agent identified the treatment as potentially dangerous.

In addition, 15 patients skipped the meal scheduled for before dawn (Suhur), five of whom persisted in taking sulphonylurea before sunrise, thereby exposing themselves to a high risk of hypoglycaemia. Furthermore, 27% of patients declared that they had refused or would refuse to take anything orally in spite of daytime hypoglycaemia, or seek medical care if a malaise occurred, because they did not wish to break their fast. Moreover, 40% failed to identify very high blood glucose (> 16.5 mmol/L) as a risky situation and, thus, would not take corrective action in such an event.

Finally, 54% of these patients did not monitor their capillary blood glucose during the entire month of Ramadan, not even after sunset, and only 12% monitored their glycaemia during the daylight hours. Indeed, 40% of patients did not wish to measure capillary blood glucose because it induces blood outflow, and some considered it as breaking the fast.

4.1.1.7. Characteristics of the type 1 diabetic patients

Analysis of the subgroup of type 1 diabetics \( (n = 20) \) revealed that they were younger \( (34 \pm 13 \text{ vs } 64 \pm 12 \text{ years}) \) with type 2; \( P < 0.0001 \) and had higher levels of education than the type 2 diabetics \( (P < 0.0001) \). Six had never fasted, seven had fasted during Ramadan, and seven had stopped fasting, six of them because of their diabetes diagnosis. Type 1 diabetics followed the advice of their GP more often, especially if the recommendation was not to undertake fasting, but always took the advice of their relatives.

4.2. Study 2: general characteristics of the GPs \( (n = 101) \)

One hundred and one GPs (31.7% women and 68.3% men) completed the questionnaire at least partially (the participation rate was < 75%). The GPs’ mean age was 50.5 ± 9.9 years, 63% practised in urban or suburban settings near Marseille, and either diabetic or Muslim patients represented a moderate proportion of their patients: 10–20% were diabetic; and less than 10% were Muslim. Of the 80 GPs who agreed to report their religious preferences, only four acknowledged being Muslim.

4.2.1.1. Medical knowledge of GPs on Ramadan fasting in diabetics

Only 2% of the interviewees declared having received any medical training on Ramadan fasting, and 77% had never read any medical information on the subject. Only 15% of the GPs declared having managed an acute complication of diabetes during the month of Ramadan, and many declared seeing their Muslim patients less during this period.

4.2.1.2. Medical attitudes towards Ramadan fasting

While 15% of the GPs reported that they had never spoken about Ramadan fasting to their Muslim diabetic patients, 85% reported that they had provided counselling on Ramadan to their Muslim diabetic patients. To the question “What do you tell them?” (about Ramadan), 44% answered that fasting is harmful to patients’ health, 25% replied that diabetes is an exemption from fasting according to the Koran, and 16% said that they had discussed the risk of fasting with their patients.

Proscribing fasting was a frequent attitude: 54% of GPs advised every Muslim diabetic not to fast, whatever the treatment regimen and even when the GPs believed that the fast would not harm their patients. The main explanation was that the GPs felt that their patients would not be able to self-manage their diabetes during the fast and so preferred to proscribe fasting to secure their patients’ health. Indeed, two of the four Muslim GPs also did so. To the question “In your opinion, does Ramadan fasting deteriorate the glycaemic control of diabetics?”, 76% answered in the positive. Furthermore, 62% stated that Ramadan fasting impairs the lipid profile and provokes weight gain.

Some GPs also freely commented that they felt they had not convinced their patients, and also expressed that, whatever they said, they believed the patient would not listen.

4.2.1.3. Therapeutic counselling proposed to patients

Only half of the GPs declared that OAD treatments should be adjusted. The adjustments proposed included reducing the dosage, postponing OAD intake until dinner time, cancelling the drug dose at midday, and switching from insulin secretagogues...
to insulin sensitizers and/or switching from sulphonylureas to taking glinides before each meal.

However, 53% of the GPs did not recommend any treatment adjustments to patients taking twice-a-day insulin regimens. Of those who reported that bid insulin should be adjusted, 86% did not specify how the adjustments should be done, 7% reported seeking the advice of a diabetologist and 7% proposed switching to a basal–bolus regimen. For patients treated with three daily insulin injections, 67% of GPs thought that the treatment should be modified, but only 42% suggested cancelling the midday insulin shot (open question).

Only 12% of the GPs thought to recommend checking capillary blood glucose more frequently (open question about medical advice given to diabetic patients who wish to fast). Also, 60% of the GPs offered no advice regarding physical activities performed during the fast. As for dietary counselling, the most cited recommendation was to avoid eating too much high-fat or high-carbohydrate foods at night. Classical advice, such as drinking plenty of liquids or taking a meal before dawn, were rarely reported (6% of GPs).

5. Discussion

This cross-sectional, population-based study was performed in the southeast of France. This is a region with large Muslim communities who originally came from southern Mediterranean countries. The Muslim presence is the result of the historical links between this geographical area of France and the Maghreb region of North Africa. To our knowledge, this is the first study to bring together two points of view (patients and physicians) on Ramadan fasting, and to confirm the importance of Ramadan fasting for Muslim patients. Despite the fact that, according to Koranic rules, Muslims with acute or chronic diseases are exempt from Ramadan fasting, 51.5% of our diabetic inpatients wished to fast during Ramadan. This study clearly confirms the risk of fasting for migrant patients who have not received medically focused education, and highlights the difficulties faced by French GPs who have no medical recommendations or expert consensus guidelines to offer their patients.

5.1. Recommendations to fast or not

In most cases, physicians strongly recommended not fasting for diabetic Muslim patients. However, our study underscores the fact that this may damage any trust between physicians and their patients. This is a particularly negative situation as confidence between patients and physicians is of particular importance for patients’ medical education and treatment adjustments. It is our opinion that physicians, when faced with their diabetic Muslim patients, must consider whether their medical advice to not fast during Ramadan is truly relevant from a medical perspective, as it forbids their Muslim patients to follow one of the major rules of Islam and is also likely to force patients into having to make an impossible choice.

Indeed, fasting against medical advice was commonly seen in our study: 53% of patients ignored their physician’s advice and 35% of patients discussed Ramadan fasting with their GP. Many patients preferred to take the advice of their local Imam, revealing a wide gap between doctors and patients. Assessing the obstacles to educational counselling for migrants has previously revealed the major role that religion plays in patients’ concepts of health and disease [12–15]. Our diabetic Muslim patients often viewed diabetes as a divine punishment, felt guilty for having the disease and believed that healing was partly in God’s hand. This might also explain the determination of some patients to not break their fast even in the face of hypoglycaemia, and why some patients did not consult with their doctor before or during the fast for fear of being advised not to fast. This was also perceived by the GPs, who reported seeing less of their Muslim patients during Ramadan.

5.2. Barriers to patient education

Study 1 confirmed the low level of education among these migrant diabetic inpatients living in Marseille who were only followed-up in hospitals, had difficulties in understanding the French language and who, consequently, had low levels of knowledge and proficiency in diabetes self-management, as previously observed [12]. As the mechanisms of how diabetic treatments work were unknown to these patients, they showed little capacity to adjust their treatments according to carbohydrate intakes, which is crucial, as Ramadan fasting involves skipping meals, while increasing carbohydrates and fatty foods at the end of the day.

In the present study, there were large proportions of both type 1 (35%) and type 2 (56%), and severely complicated (38.5%), diabetic patients who continued to fast during the month of Ramadan, including women who had fasted during ongoing pregnancies. The psychological and social importance of fasting during Ramadan has already been emphasized by others, especially in non-Islamic countries where the sense of belonging to a community is important for migrants [13]. In addition, in our present study, some workers explained that they had not talked to their employer about being diabetic, and had fasted because not fasting would have been evidence of having a disease that they wanted to hide.

Patients in the Fasting group were younger, had a shorter duration of diabetes, were less often being treated with insulin and were more adherent to their religious practices compared with patients in the Non-Fasting group, thereby highlighting the role of age, duration of disease, type of treatment and religious beliefs in influencing the decision to fast or not. Also, the decision to fast in some patients may be related to their perception of diabetes. Many diabetics — and particularly Muslim diabetics — do not consider themselves sick in the early stages of the disease. Indeed, disease perception and other considerations depend on patients’ culture and religion [14], and are especially important with chronic diseases that have few or no physical symptoms, such as diabetes [15]. Moreover, women appeared to give up fasting sooner after a diagnosis of diabetes than did men, reinforcing the role of the father in the Muslim family as an exemplar [14].
5.3. Cross-cultural competence

The data obtained in study 2 showed that GPs most frequently lacked both the specific medical knowledge needed to provide appropriate counseling to diabetics as regards fasting and the cultural competence to suitably discuss the subject of Ramadan fasting with their Muslim patients. The nature and content of the advice given to patients was often scanty, and the prohibition of fasting was sometimes not medically relevant. Indeed, seven of the 19 patients in the study 1 subgroup who had been denied permission to fast exhibited none of the conditions that make fasting dangerous in diabetics, as defined by expert consensus [9,10], highlighting the negative attitude of French GPs towards Ramadan fasting. GPs’ practical know-how was also inadequate especially with respect to therapeutic adjustments. Many GPs focused on the increased amount of sweet foods taken during Iftar and on the potential changes in patients’ weight, but this, in fact, is still a subject of debate in the literature [3–7,16]. Interestingly, many GPs felt that their advice was unconvincing and ineffectual, and some even felt helpless, suggesting that many GPs were aware, to some degree, of their lack of cultural competence, and preferred to forbid fasting rather than give inadequate medical advice to their patients.

Both the patients’ and physicians’ answers suggest a problem of communication and a dysfunctional physician–patient relationship prone to misunderstandings, thereby impeding the transmission of educational information and contributing to harmful patients’ behaviour [17,18]. The fact that six patients in the study 1 subgroup observed Ramadan fasting while continuing to inject short-acting insulin analogues or take insulin secretagogues at noon is particularly revealing. In contexts other than Ramadan fasting, some authors [19–21] have previously emphasized the frequent occurrence of misunderstandings in cross-cultural relationships.

The lack of a national consensus on GPs’ advice and the multiplicity of opinions concerning Ramadan may be responsible for the lack of discussion between GPs and some of their patients. On the other hand, the decision to fast was always discussed with relatives (100%), while the Imam was often also consulted for advice (25%). Ghouri et al. [22] showed the positive influence of religious authorities and prominent members of ethnic minorities in encouraging healthcare, such as holding a health fair in a mosque during Ramadan month. Furthermore, the Ramadan Education and Awareness in Diabetes (READ) study [23] showed that the patients who attended an educational programme focused on Ramadan had a significant decrease in hypoglycemic events (from 9 to 5) compared with patients who fasted during Ramadan without attending a structured educational session (from 9 to 36; \( P < 0.001 \)), thus confirming the positive impact of patient education on adverse events during the fast.

5.4. Study limitations

Our study had several limitations. Patients’ answers may have a memory bias, especially with respect to adverse events occurring during Ramadan or to counseling received for the adjustment of treatments. GPs filled in their questionnaires on their own, and either did not always answer all the questions, or provided answers to open questions that sometimes lacked clarity or explanations for a better understanding of what they meant.

Ramadan fasting remains a challenge for both Muslim diabetic patients who wish to fast despite their disease and GPs who, in spite of the cultural gap, need to understand the desire or determination of their patients and so provide them with intensive education instead. The present study revealed that systematic advice on treatment adjustment is required. Because of the religious nature of the fast, the decision is ultimately up to the patient, but a holistic approach should reduce the gap in the physician–patient relationship.

The period preceding Ramadan is the time to offer work groups on diabetes education, with sessions focused on Ramadan fasting and adjustment of treatment to the new eating patterns and carbohydrate intakes. New therapeutic strategies, including glucagon-like peptide-1 (GLP-1) analogues, dipeptidyl peptidase (DPP)-4 inhibitors for type 2 diabetics and multiple injection basal–bolus regimens for type 1 diabetics, should reduce the number of adverse events during the fast and facilitate therapeutic adjustments [24]. Bilingual translators and Imams should also be included. Finally, we encourage medical training for GPs and Imams on the subject of Ramadan fasting.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

Appendix A. Supplementary data

Supplementary material (Table S1, Figs. S1A and S1B) associated with this article can be found at http://www.sciencedirect.com, at doi:10.1016/j.diabet.2010.12.010.

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