How patients’ attitudes and opinions influence self-care behaviours in type 2 diabetes. Insights from the French DIABASIS Survey


Aim. – This study evaluated the profiles of patients with type 2 diabetes (T2DM) to identify sets of opinions and attitudes towards the disease that might influence self-care behaviours.

Methods. – Altogether, 1,092 patients with T2DM, aged 45 or older from a large representative French cohort, completed a self-questionnaire exploring their knowledge and perceptions of diabetes, its impact on various aspects of daily life and self-management practices. Canonical and cluster analyses were used to identify sets of homogeneous ‘profiles’ of patients linking attitudes and opinions to specific disease-related behaviours (such as changes in lifestyle, drug compliance, treatment satisfaction, impact on everyday life and weight gain).

Results. – Demographics of the T2DM study population were previously reported along with the main results (60% male; mean age: 66 years; mean age at diagnosis: 55 years; mean BMI: 29 kg/m²). Five distinct patient types emerged from the typological approach: ‘committed’ (25%); ‘carefree’ (23%); ‘bitter’ (19%); ‘disheartened’ (19%); and ‘overwhelmed’ (15%). Each patient type defined a set of attitudes and beliefs towards T2DM that influenced disease-related behaviours, leading to different degrees of diabetes self-management.

Conclusion. – The DIABASIS survey provides important information for diabetes care by identifying distinct patients’ profiles that express different degrees of difficulty in implementing self-management. For this reason, patients in each category require different kinds of customized support from their physician to induce behavioural changes that may be key in improving their metabolic control.

Keywords: Type 2 diabetes; Patient profiles; Behaviour; Beliefs; Self-management

Résumé

Comment les opinions et les attitudes des patients vis-à-vis de leur diabète de type 2 influencent leur implication dans sa prise en charge ? Les leçons de Diabasis.

Objectif. – Décrire des profils de patients diabétiques de type 2 (DT2) afin d’identifier leurs opinions et attitudes vis-à-vis du diabète susceptibles d’influencer leur engagement dans la prise en charge de la maladie.

Méthodes. – Mille quatre-vingt-douze patients DT2 âgés de 45 ans ou plus, issus d’un large échantillon représentatif français, ont répondu à un autoquestionnaire explorant leurs connaissances et leurs perceptions vis-à-vis du diabète, son impact sur différents aspects de leur vie quotidienne et leur niveau d’implication dans sa prise en charge. Des analyses multivariées explicatives de type canonique ont été utilisées pour identifier des profils homogènes de patients liant certaines attitudes et opinions sur leur diabète à des comportements spécifiques (modification du mode de vie, observation thérapeutique, satisfaction du traitement, retentissement sur la vie quotidienne et prise de poids).
1. Introduction

Type 2 diabetes (T2DM) is a chronic disease in which lifestyle modifications and self-management are critical components of care. The DIABASIS survey highlighted the importance of a collaborative relationship between T2DM patients and their healthcare professional (HCP), and patients’ family support, to providing encouragement and promoting accountability [1]. In addition, important gaps were identified, such as poor knowledge of diabetes causation, helplessness and anxiety at the time of diagnosis, as well as the need for more information and discussion with the physician at that critical time, little awareness of the need for physical activity, medication-related concerns (complexity of drug regimens and high frequency of side-effects), and patients’ expectations of medication and disease management.

Research on diabetes has established that, to improve glucose control and long-term health outcomes, patients need to embark on—and maintain—a complex range of self-care behaviours (such as following a diet, engaging in regular exercise and taking medication). A high level of patient participation is needed for effective management, so promoting effective and workable self-management merits more attention from the HCP. However, little is known of the successful strategies that encourage patients to take an active and responsible role in self-management. Recent reports have shown that the individual’s age, personal history and personal beliefs concerning the cause of diabetes, helplessness and anxiety at the time of diagnosis, as well as the need for more information and discussion with the physician at that critical time, little awareness of the need for physical activity, medication-related concerns (complexity of drug regimens and high frequency of side-effects), and patients’ expectations of medication and disease management.

2. Methods

2.1. Study design

The design of this national survey, conducted between December 2007 and January 2008 in a representative sample of the French population aged ≥ 45 years, has been described in detail elsewhere [1]. In brief, self-questionnaires were mailed out by a polling agency (TNS Healthcare Sofres) to a representative cohort of the general population aged ≥ 45 years.
behavioural variables – patients’ opinions and behaviours (Q33 and Q34).

To avoid creating a ‘non-treated patient’ cluster, those who were treated by diet alone were excluded from the initial analysis, as they could not answer the question about treatment satisfaction. For the final analysis, each non-treated patient was attached to the patient type that he/she most closely resembled.

Score centring was used to level out the individual differences in scoring (between individuals who generally overrate and those who underrate). A factorial analysis was then performed to replace the high number of variables with a limited number of ‘summary’ variables.

The aim of the typology was to position patients according to both canonical axes using stepwise discriminant analyses. For the first classification, a $k$-means algorithm was applied to obtain clusters of individuals (on the basis of a first random sample of 50 individuals), a process that was repeated 100 times [5]. An ascending hierarchical classification was then applied to determine the best clustering, defined as minimizing the number of groups while maximizing the differences between them. Patients were then distributed across five groups along both axes, placing each group at a point the most distant from each other and, within each group, as homogeneously as possible.

The two canonical axes were: the y axis – behaviour, or ability to change – ranging from patients to whom the disease is a burden to those who are able to adapt and are not overly distressed by the disease; and the x axis – attitude/opinion, or acceptance/self-involvement – ranging from patients in denial to those who accept the consequences of the disease on their lifestyle.

Throughout the present report, for all percentages showing a difference in a subtype of patients vs. what is observed in the general population (for example, 37% vs. 22% overall), the difference was statistically significant ($P < 0.05$).

### 3. Results

#### 3.1. Patient population

The main characteristics of the T2DM population were: 60% male; mean age: 66 years; mean age at diagnosis: 55 years; mean body mass index (BMI): 29 kg/m² (39% were overweight and 37% were obese); and mean duration of disease: 11 years (Table 1). The disease was mostly diagnosed (80%) and managed (93%) by primary-care physicians (PCP). In 74% of cases, the diagnosis was made following routine biological testing. Feelings of anxiety/fear at disease onset were reported by 43% of patients overall. The disease was managed by a diabetologist in only 29% of cases.

The disease was relatively well controlled. In the 12 months prior to the survey, glucose control was acceptable in most cases, with 45% of patients having an HbA1c < 7%; the mean HbA1c was 7%. Ten percent of patients were under a diet-and-lifestyle management regime only, while 90% were using drug therapy; of the latter, 81% were treated with oral antidiabetic drugs (OADs) alone, 10% with both OADs and insulin and 9% with insulin alone. The mean time from diagnosis to insulin initiation was 13.8 years. Of the OADs, metformin and sulfonylureas were the most frequently prescribed drugs (60% and 53%, respectively), whereas thiazolidinediones (TZDs) represented 11% of prescriptions. In addition, 44% of patients were treated with monotherapy, 27% were using bitherapy and 10% were using three or more OADs; 50% reported implementing a change in diet and 30% in exercise. The overall level of compliance with drugs was good (83%), and 61% of patients reported adverse events (24% were hypoglycaemia).

#### 3.2. Typology and patient profiles

Five patient types emerged from the canonical analysis: ‘committed’ (25%); ‘carefree’ (23%); ‘bitter’ (19%); ‘disheartened’ (19%); and ‘overwhelmed’ (15%) (Fig. 1). The most evident differences between categories were the patients’ commitment to lifestyle changes, especially exercise, and their support needs for diabetes management. Each category’s distinguishing features and patients’ profiles are summarized below.
The patients’ main demographic and clinical characteristics for each of the five types are presented in Table 2. The percentages refer to the responses (to the self-questionnaire) by the patients in one specific profile vs. those of the whole DIABASIS survey population (where $P<0.05$).

3.2.1. Committed patients (25%)

This group of patients makes self-management a priority; they take action. They believe that their previous dietary habits and lack of exercise contributed to the onset of their diabetes. They express guilty feelings and tend to link the disease to their previous way of life with self-blame (37% vs. 22% overall). These patients used to enjoy indulging in good food and are former bons vivants, appreciating the good things in life, and believe they bear the primary responsibility for their disease.

This group has the best knowledge of the disease (63% vs. 57% overall knew what the HbA1c was used for), and is more committed to following lifestyle advice. These patients care about what they eat: they have stopped snacking; reduced the overall quantity of food they eat, especially sugary and fatty foods; and organize their own food-shopping, social life and restaurant invitations. Over half have started physical activities (53% vs. 30% overall), and the majority declares having no difficulty in exercising (60% vs. 38% overall).

Their physicians are viewed as partners in their treatment, and they also describe their close family members and friends as supportive. They declare being more compliant with drugs (90% vs. 83% overall), and report fewer adverse drug effects (48% vs. 61% overall) and less diabetes-related distress in general.

As a result, these patients do not perceive the disease as a burden in their everyday life, and cope well with personal (sentimental and sexual life), family, professional and social adjustments. They actively manage their disease and are more compliant than average.

Table 2
Main demographic and disease characteristics of patients according to the five profiles.

<table>
<thead>
<tr>
<th></th>
<th>Committed (25%)</th>
<th>Carefree (23%)</th>
<th>Bitter (19%)</th>
<th>Disheartened (19%)</th>
<th>Overwhelmed (15%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (% male)</td>
<td>74.4</td>
<td>66.6</td>
<td>46.5</td>
<td>53.1</td>
<td>49.9</td>
</tr>
<tr>
<td>Mean age (years) ± SD</td>
<td>66.49 ± 10.0</td>
<td>67.19 ± 10.7</td>
<td>64.10 ± 10.6</td>
<td>66.98 ± 10.3</td>
<td>66.97 ± 10.6</td>
</tr>
<tr>
<td>Patients (%) aged ≥ 65 years</td>
<td>55.1</td>
<td>55.8</td>
<td>44.0</td>
<td>57.2</td>
<td>56.3</td>
</tr>
<tr>
<td>Mean duration of diabetes (years) ± SD</td>
<td>11.9 ± 11.8</td>
<td>12.0 ± 11.2</td>
<td>11.6 ± 11.2</td>
<td>13.6 ± 14.2</td>
<td>12.5 ± 11.2</td>
</tr>
<tr>
<td>Mean BMI (kg/m²) ± SD</td>
<td>28.28 ± 4.6</td>
<td>28.65 ± 4.7</td>
<td>28.98 ± 5.9</td>
<td>28.99 ± 5.2</td>
<td>30.21 ± 5.9</td>
</tr>
<tr>
<td>Obese patients (%)</td>
<td>30.9</td>
<td>35.2</td>
<td>36.6</td>
<td>42.3</td>
<td>41.9</td>
</tr>
<tr>
<td>Current body weight (kg)</td>
<td>81.4</td>
<td>81.4</td>
<td>81.5</td>
<td>80.6</td>
<td>82.7</td>
</tr>
<tr>
<td>Mean HbA1c (%) ± SD</td>
<td>6.8 ± 1.1</td>
<td>6.9 ± 1.2</td>
<td>7.3 ± 1.0</td>
<td>6.9 ± 0.9</td>
<td>7.0 ± 1.0</td>
</tr>
<tr>
<td>Patients (%)</td>
<td>30.4</td>
<td>30.1</td>
<td>16.6</td>
<td>26.3</td>
<td>26.4</td>
</tr>
<tr>
<td>Patients (%) with HbA1c ≤ 6.5%</td>
<td>18.7</td>
<td>12.6</td>
<td>32.5</td>
<td>29.0</td>
<td>40.0</td>
</tr>
</tbody>
</table>

BMI: body mass index.
3.2.2. Carefree patients (23%)

These individuals are not deeply concerned about having diabetes. At disease onset, only a few expressed anxiety (16% vs. 43% overall), while 36% (vs. 20% overall) were indifferent. They see themselves as being in good health in general (in 87% of cases vs. 74% overall), and only 37% (vs. 51% overall) consider the disease serious.

There are slightly more men than women in this group (67% vs. 60% overall). They do not believe they have to modify their lifestyle because they take their medications. This means that, while drug compliance is good (90%), self-care is minimal in this group: 94% have not changed their eating habits (vs. 50% overall) and 89% have not changed their exercise habits at all. On the other hand, they show higher-than-average drug compliance (90% vs. 83% overall), and report fewer adverse events (47% vs. 61% overall).

They do not involve their family in their disease management and believe that diabetes does not have an impact on their family or social daily life. Indeed, diabetes is not a burden for these patients and does not disturb their day-to-day (personal, family, professional or sentimental) life. In general, they minimize their situation; the disease is taken care of by the drug and does not further interfere with their lives. However, it is possible that they are not truly more compliant than average, but only that their denial of non-compliance is greater.

3.2.3. Bitter patients (19%)

Unfairness and revolt (53% vs. 23% overall) are the main feelings expressed by this group. They do not feel guilty over the disease and do not believe that their previous lifestyle was involved in its onset. Most of them believe that their family history and genetic background are solely responsible for their diabetes.

These patients are more often female (53% vs. 40% overall) and, as their daily life is impaired by diabetes, they complain about the effects of the disease. For them, the routine of living with diabetes is a negative experience, perceived as a heavy burden on every aspect of daily life (meals, social and professional life, sentimental and sexual life). They encounter difficulties in implementing healthy eating habits, and half (49% vs. 29% overall) complain about the inconvenience of a regular exercise routine.

They perceive themselves as having to put up with the disease and its drug therapy, and do so with more frequent complaints of adverse events (80% vs. 61% overall), such as hypoglycaemia, abdominal pain and diarrhoea, while having a lower rate of treatment satisfaction (41% vs. 25% overall). They more frequently use insulin treatment (25%) and have lower compliance than average. Their glucose control is also poorer, with higher HbA1c levels (7.3% vs. 7.0% overall).

Family support is more prominent and visits to HCPs (both general practitioners and specialists) are more frequent, with an average total of 10 visits in the past year vs. six visits overall. They also seek more advice from specialists (diabetologists, cardiologists and ophthalmologists).

These patients see diabetes self-management as an undeserved burden that intrudes on their daily life. Even when they recognize the risk of complications, they still have major difficulties in changing their lifestyles and adhering to treatment.

3.2.4. Disheartened patients (19%)

There are slightly more women than men in this group (47% vs. 40% overall) and they have little control over the daily routine of living with diabetes. Having low motivation, they also have more difficulties in controlling their diet (constantly swinging between periods of restriction and overindulgence). Some are obsessed by diet (18% vs. 12% overall), but are easily discouraged; they also frequently complain of weight gain (45% vs. 23% overall) and are more likely to be obese (42% vs. 37% overall).

Because of their difficulties in implementing long-lasting, sustained changes in lifestyle, they simply give up. This might explain why they declare a low impact of the disease on their daily habits, socializing and, especially, their professional lives (94% vs. 44% overall) despite complaining more frequently of drug-related adverse events (69% vs. 61% overall). Another reason why this group does not feel that diabetes overly impacts their lives could be the limited self-care practices that they implement. The obstacles faced by these patients, such as overweight and low motivation, are key considerations that need to be taken into account in their management.

3.2.5. Overwhelmed patients (15%)

This group of patients initially reacted to their diabetes diagnosis with anxiety and fear (44% vs. 30% overall), and express more feelings of depression (42% vs. 7% overall). They also feel both revolted (41% vs. 23% overall) and guilty (31% vs. 22% overall), and tend more often to avoid talking about the disease for fear of being stigmatized (24% vs. 11% overall).

These patients are more often female (50% vs. 40% overall), more frequently perceive their health as being bad (40% vs. 25% overall) and feel that diabetes is a heavy burden on every aspect of life. They are more obsessed with diet (25% vs. 12% overall), but have difficulties in sticking to one (16% vs. 10% overall swing from periods of restriction to overindulgence). They also have greater difficulties in exercising (40% vs. 29% overall) and, as a consequence, more frequently gain weight (35% vs. 23% overall), with an average gain of 8 kg since starting treatment; 42% (vs. 37% overall) of them are obese.

On average, these patients have poor compliance with medication. They also report more frequent adverse events (in particular, hypoglycaemia, reported by 61%) and more frequent insulin use (25%), thereby contributing to less treatment satisfaction (41% had low satisfaction rates vs. 25% overall). In addition, they express a need for more information, especially concerning drug therapy (61% vs. 49% overall).

Living with diabetes is considered a heavy burden on every aspect of their daily life, impacting especially on relationships within their inner circle (42% vs. 12% overall) and in their professional life (44% vs. 27% overall). Also, their support from family and medical professionals is stronger: their fam-
ily helps them to modify their eating habits, and encourages their compliance with treatment and appointments with healthcare professionals. More of these patients visit a diabetologist (39% vs. 29% overall).

This group of patients has a high level of dissatisfaction, experiences considerable difficulty in managing their diabetes and needs more active support to cope with their burden.

4. Discussion and conclusion

The present analysis of the DIABASIS study provides insight into T2DM patient self-management by identifying five distinct patient types (described above). Each type of patient constitutes a set of opinions and attitudes towards the disease that influences their disease-related behaviours, leading to different degrees of commitment to diabetes self-management. These findings could assist the HCP in understanding what motivates or inhibits a given patient type, and could be the key to helping HCPs adapt their approach to break the vicious circle of lack of control that leads to discouraging self-management.

The most apparent patients’ differences are in their clinical characteristics – namely, body weight and medical treatment. Disheartened and overwhelmed patients are more overweight, and bitter and overwhelmed patients are more frequently treated with insulin. In addition, overwhelmed patients appear to have feelings of depression more frequently and are overall less satisfied with treatment. Previous studies have already associated severity of depression with poorer adherence to dietary guidelines and medication regimens [6,7], and higher BMI scores [8]. This could explain the difficulties faced by this group with self-management. One aspect of the depression these patients experience has been linked to side-effects of diabetes medications [7]. The main side-effect with significant implications for diabetes management is hypoglycaemia, reported significantly more often in the overwhelmed group (61%). Hypoglycaemia and fear of hypoglycaemia have both been shown to negatively impact diabetes management, glucose control and subsequent health outcomes [9,10]. Diabetic patients who fear hypoglycaemic episodes may go to great lengths to maintain blood glucose at levels in a higher-than-normal range just to avoid such events [10,11].

Differences in the degree to which patients believe they can alter the disease course through playing an active role in their own care is probably key and, indeed, committed patients tend to be less distressed over their disease and more able to maintain lifestyle changes. In contrast, bitter patients, who did not accept responsibility for their disease – believing that family history and genetics are the only causes of diabetes – are not as good at implementing lifestyle changes and are unlikely to take an active role in their disease management. The belief that ascribes variable importance to lifestyle vs. genetic factors in disease causation and the patients’ own commitment to diabetes care have already been acknowledged by others [3,10,12]. The carefree group differs from the others in that their approach is mainly biomedical – they believe that disease management is simply about taking a drug. They are relatively unconcerned about their disease and make no effort to change their behaviours, whereas their drug compliance is better than the other patient types. This is not surprising as they are convinced that the drug regimen is the answer to their disease; it also leads to a lack of commitment to lifestyle changes. It ascribes to a different illness model than the other groups, who have a more holistic, psychosocial model [13].

The carefree group also differs from the other groups in family support. As diabetes does not impact their daily life, these patients do not involve their close family in the management of the disease and, consequently, do not need family support. This is in contrast to the bitter and overwhelmed groups, for whom family support is more prominent. For these patient types, the characteristics of the patients’ family setting should be taken into account to ensure the effectiveness of interventions, as these characteristics could significantly influence the patient’s self-care behaviours [14]. The literature indicates that the individuals in a patient’s support network can also influence the behavioural response to illness [15]. It appears that patients and their “significant others” generally share the same perception of the disease, although the partners’ influence on patients’ behaviour is minimal and typically limited to supporting changes in lifestyle and, particularly, physical activity. This could explain why, in our surveyed population, greater family support was not clearly associated with a higher commitment to diet and exercise guidelines.

Changes in self-management behaviours (dietary changes, regular exercise) impact both the patient and his social milieu [15], so it is not surprising that patients who perceive diabetes as a burden on their social life have greater difficulties in implementing new behaviours. The overwhelmed group, in particular, finds that their professional life is especially affected by the disease, and these patients are likely to find it particularly difficult to maintain lifestyle changes when professional demands increase, as has been found in other studies [16]. It is also highly likely that the fear of hypoglycaemia experienced by the overwhelmed group extends beyond the patient and has an impact on their family, friends and work colleagues.

Patients who find it difficult to adhere to treatment and who experience numerous difficulties in implementing a healthy lifestyle turn to the healthcare system for support, implying greater services use. The role of the HCP is to encourage and motivate patients to take their disease management seriously. This means that the relationship that develops between the patient and HCP, and the level of satisfaction with the services received, have an influence on the patient’s perception of the disease and the role he/she plays in its management [17–19]. Committed patients tend to be satisfied with their relationship with their physicians, and see them as partners rather than decision-makers. Ultimately, however, treatment decisions are up to the patient, who therefore needs to receive meaningful information in a way that allows him to make his own mind up. This approach leads to better adherence to lifestyle changes than when instructions are given in a controlling or authoritarian manner. This idea of supporting patients’ autonomy was also reported by Williams et al. [20], who found better glycaemic control in patients who perceived their HCPs in this light.
While the present study did not explore the influence of patients’ attitudes on glycaemic control, others have found a correlation [2,3,21]. In Sweden, 259 participants were recruited from T2DM patients attending an educational programme delivered by pharmacists [16]. A questionnaire designed to explore the patients’ attitudes towards self-management was administered at the end of the program. HbA1c was measured in these patients on four occasions throughout the programme, and three categories or self-management profiles were identified: ‘disease managers’ (55%); ‘compliant’ (31%); and ‘disheartened’ (10%). Although these patients did not differ initially in metabolic control, by the end of the programme, the disease managers had achieved significantly better and more sustained metabolic control than the compliant who, in turn, did better than the smallest group, the disheartened, who failed to achieve any reduction in HbA1c [16]. Another study in which 44 T2DM patients were categorized according to their glycaemic control (from poor, with HbA1c > 8.0%, to excellent, with HbA1c < 6.5%) found similar results [3]. The patients also participated in a one-on-one semi-structured interview, which investigated their personal backgrounds and self-management philosophies. The final five categories included the ‘committed’ and ‘tentative’, who had good control; and the ‘hopeful’, ‘hassled’ and ‘overwhelmed’, who had poor control [3]. These two reports confirm the correlation between HbA1c levels and personal attitudes, regardless of whether the investigators’ starting point was based on patients’ profiles or degree of glycaemic control. One US study, conducted with a nationwide sample of Veterans Affairs (VA) patients with diabetes, found that patients who were more actively engaged in their diabetes self-care had significantly lower HbA1c levels and also used the recommended diabetes services to a greater extent [22]. Our present study appears to be in line with these findings in that the categories with greater difficulties in accepting and managing diabetes, such as the bitter group, tended to have poorer metabolic control. However, due to the cross-sectional design of all these studies, a cause-and-effect relationship between self-management and glycaemic control cannot be firmly established.

The DIABASIS survey offers important information for diabetes care, as a deeper understanding of patients’ perceptions of the disease is key to optimizing customized care. Distinct types of behaviours that influence patients’ ability to make optimal use of available treatments and services are discernible. However, some methodological limitations of DIABASIS need to be acknowledged. The survey was based not on samples randomly selected from the whole population, but on the permanent cohort of a polling agency (frequently used in epidemiological studies). This has to be weighed against its main advantage of feasibility: the low cost and simplicity of the quota method facilitates the study of large samples with regular updates. Another limitation is the fact that adaptation to a chronic disease is a dynamic process, and patients’ roles vis-a-vis their disease management fluctuate considerably over time [21]. In people whose attitudes towards diabetes are variable, two factors – weight and age – appear to influence changes in their views and, in turn, their shift into another category. The DIABASIS survey was cross-sectional and captured patients’ perceptions at a single point in time. For this reason, it would be useful to repeat it over time to see if and how self-management in these patient categories changes. Finally, symptoms and co-morbidities, which can also influence patients’ self-management commitments, were not investigated [2,3,23] and, in particular, there were no data on complications, which may also have a significant impact on patients’ attitudes. In addition, the interpretation that individuals apply to their own physical changes and the influence that will have on their self-management practices need to be further explored. Finally, a limitation inherent to such typological analyses is that they are essentially retrospective in nature and so, when the HCP first sees a patient, there is no way to know into which category the particular patient belongs.

Nevertheless, this large-scale survey provides further insights into attitudes and beliefs towards T2DM, and identifies five patient profiles that express different levels of difficulty in implementing self-management practices. Each profile is based on a number of factors – many of which are subjective – that need to be taken into account for consistent and complete diabetes care. Patients in each category require different kinds of support from their HCP to promote effective self-management and the behavioural changes that could be key in improving metabolic control.

Conflict of interest statement

All of the authors, except for C. Touboul of TNS Healthcare, were members of the DIABASIS Scientific Committee. Professor S. Halimi is also on the advisory panel for Novartis and has received speaker’s and consultant’s fees from Novartis as well as other pharmaceutical companies (Abbott, Amgen, Astra-Zeneca, Bayer, Boehringer Ingelheim, Eli Lilly, Glaxo-SmithKline, LifeScan, Merck Sharp & Dohme-Chibret, Novo Nordisk, Pfizer, Roche Diagnostics, Roche Pharma, Sankyo, Sanofi Aventis, Servier, Takeda and Therval). Professor P.-J. Guillausseau is on the advisory panel for Novartis, and has received speaker’s and consultant’s fees from Novartis as well as other pharmaceutical companies (Eli Lilly, Glaxo-SmithKline, Novo Nordisk, Pfizer, Roche, Sanofi Aventis, Servier, Takeda and Therval). Dr M.L. Virally is a consultant for Novartis. Dr E. Eschwège has received fees from Astra-Zeneca, GlaxoSmithKline, Merck-Lipha, Novartis, Novo Nordisk, Roche Pharma, Sanofi Aventis, Servier and Takeda. Dr Helen Mosnier-Pudar has received speaker’s and consultant’s fees from Novartis as well as other pharmaceutical companies (Eli Lilly, Novo Nordisk, Pfizer, Roche, Sanofi Aventis, Takeda and LifeScan), and Dr Ghislaine Hochberg has received speaker’s fees from Novartis, among other companies. Dr Sylvie Dejager is an employee of Novartis Pharma.

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References


