

ORIGINAL ARTICLE

Multidisciplinary Panel Consensus for the Management of Patients with Type 2 Diabetes: A Delphi Study

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Received for publication April 3, 2023; accepted November 16, 2023 (ARCMED-D-23-00279).

Aim. To reach a multidisciplinary consensus on managing patients with type 2 diabetes among specialists in family medicine, cardiology, endocrinology, internal medicine, and nephrology.

Methods. A two-round Delphi study was conducted using a questionnaire with 68 positive/negative statements distributed in four thematic blocks on diabetes management: early diagnosis and prediabetes, referral criteria, treatment and comorbidities, and clinical management. The expert panel was composed of 105 physicians from different specialties (family medicine, cardiology, endocrinology, internal medicine, and nephrology) with experience in managing patients with diabetes and who were members of a diabetes-related society.

Results. Response rates for the first and second rounds were 86.7 and 75.2%, respectively. After both rounds, a consensus was reached on 52 (76.5%) items. The recommendations with the highest degree of consensus (median = 10, IQR = 0.00) were related to anti-smoking education, cardiovascular risk factor target control, and diabetic kidney disease. There were significant differences between family physicians and other specialties for some items.

Conclusions. This study provides a set of recommendations for diabetes management agreed upon by specialists from different healthcare settings. © 2023 Instituto Mexicano del Seguro Social (IMSS). Published by Elsevier Inc. All rights reserved.

Keywords: Type 2 Diabetes Mellitus, Disease management, Delphi technique, Consensus, Patient care team.

Introduction

Type 2 diabetes (T2D) is a group of metabolic diseases characterized by chronic hyperglycemia and insulin resistance, which can cause long-term damage to several or-

gans and body structures, namely macroangiopathy and microangiopathy (1). For this reason, prevention and management of risk factors and complications of T2D, such as diabetic retinopathy (DR), cardiovascular disease (CVD) (2), central nervous system alterations (3), diabetic kidney disease (DKD) (4), diabetic foot disease (5–7), polyneuropathy (8), and peripheral arteriopathy (9), is crucial.

The multidisciplinary team (MDT) approach improves diabetes treatment outcomes, helps prevent disease progression, and reduces complications (10). The MDT model

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aims to improve metabolic control, survival, and quality of life and promote the efficient use of public resources for patients with T2D (11,12). Therefore, MDT participation is recommended as an integral part of the standard of care for patients (13). The systematic review by Dankoly US, et al. (14) found a need for an adapted patient-centered multidisciplinary team and an integrated care approach.

Zoberi KA, et al. (15) found differences in T2D management between family medicine and general internal medicine settings. Chou PL, et al. (16) found that patients cared for by family physicians had fewer acute complications than those cared for by endocrinologists or internists and had lower health expenses than other specialists. A previous study conducted in Albany, New York demonstrated that adherence to the American Diabetes Association (ADA) clinical practice recommendations was better in the endocrinology than in the primary care setting (17). In 2017, Cornell S, (18) found differences between the American Diabetes Association-European Association for the Study of Diabetes and the American Association of Clinical Endocrinologists-American College of Endocrinology regarding A1C levels for a new diagnosis, choice of first-line therapy and other targets, and concluded that, in practice, the first guideline tends to be easier for family physicians to use due to the simple stepwise intensification regimen, whereas the second one is more often followed by endocrinologists or other specialists due to the more aggressive targets.

The Spanish healthcare system is a public system with no co-payments for visits, referrals, or use of complementary tests. In Spain, the family physician is the core of the system and is the first access point to which patients go for any health problem. This physician assesses the problem and, if necessary, refers the patient to other specialists, usually to the referral hospital. The patient cannot go directly to the hospital specialists without the family physician's report, except in urgent situations that go directly to the hospital's emergency department. In Spain, the guidelines or recommendations for the management of patients with diabetes differ according to the specialty, such as endocrinology and nutrition (19), family medicine (20) internal medicine (21), or cardiology (22,23). The consensus among different medical specialists is crucial for the diagnosis, treatment, follow-up, and evolution of T2D target organ injuries. This study aimed to achieve a multidisciplinary consensus on the management of T2D among specialists in family medicine, cardiology, endocrinology, internal medicine, and nephrology.

Subjects, Materials, and Methods

This study used the two-round Delphi technique (24) to systematically collect expert opinions and reach a consensus on the management of T2D. It was conducted in Spain between October 2020 and March 2021. Ethics committee

approval was not required because no patient data were used.

A scientific committee, composed of a multidisciplinary group of physicians (two primary care physicians, one endocrinologist, one cardiologist, one internist, and one nephrologist) with extensive experience in the management of patients with T2D, was responsible for designing the Delphi questionnaire and selecting the members of the expert panel. The experts were asked to anonymously answer an online questionnaire, based on their knowledge and experience. Participants in the expert panel were selected based on the following criteria: at least 10 years of experience in the management of patients with T2D, active work with patients in the corresponding health department, and membership in a diabetes-related society. A Spanish health care center serves a population of about 25,000 people and each family physician is assigned about 1,500 patients. If the family physician considers it necessary, he/she refers the patient to other specialists. The health area includes a population of 250,000 inhabitants and consists of 10 public health centers and a public referral hospital.

To represent different specialties and experiences with T2D, a total of 105 experts from different healthcare areas, (family medicine [$n = 22$], cardiology [$n = 21$], endocrinology [$n = 23$], internal medicine [$n = 19$], and nephrology [$n = 20$]), were invited to participate in this study. The sample size was not calculated because there is no agreement on the expert sample size for this type of study. An invitation letter describing the study objective and the Delphi process was sent online to each candidate. After agreeing to participate in the study, they received an electronic link to access the online Delphi questionnaire. They could withdraw from the study at any time.

Based on a previous literature review and their experience in T2D management, the scientific committee proposed the content of the Delphi questionnaire in several online meetings. They developed 68 questionnaire items divided into four thematic blocks: a) Early diagnosis and prediabetes (24 items); b) Referral criteria (10 items); c) Treatment of T2D and comorbidities (26 items); and d) Clinical management (8 items). All items were positive or negative statements about the appropriate management of patients with T2D, and respondents were asked to indicate their level of agreement or disagreement with each item using a 10-point ordinal Likert-type scale (where 0 was "strongly disagree" and 10 was "strongly agree"). The Delphi questionnaire is available in the Supplementary Material. An external company developed the online questionnaire using the Innway Manager platform.

The Delphi process consisted of two rounds. The first one took place between December 16, 2020, and January 10, 2021. Three reminders were sent to non-respondents to encourage participation. After analyzing the data of the first round, the items that reached consensus were removed from the questionnaire. The updated Delphi questionnaire

and a summary of the first-round results were sent only to the respondents of the first Delphi round. This feedback from the expert panel members allowed them to modify their answers according to the general judgment of the entire expert panel. The second round was conducted between February 2 and 15, 2021 (with three reminders). The external collaborator received the panelists' responses and provided them anonymously to the research group. The study researchers analyzed the results of both rounds and presented them to the scientific committee which developed a set of recommendations.

Statistical Analysis

The sex of the expert participants was expressed as a percentage, trying to achieve a similar proportion between men and women. The median and the relative interquartile range (IQR) were calculated to determine the degree of consensus among the participants. An IQR <0.4 and a median ≥ 8 (agreement) or a median ≤ 2 (disagreement) were considered to indicate consensus, which means that at least 50% of participants gave very high scores in agreement with the corresponding item and that all scores were within 0.4 points of the mean score.

The nonparametric Kruskal-Wallis test was used to evaluate the results for each item by medical specialty (family medicine, cardiology, endocrinology, internal medicine, and nephrology). When significant differences were found, the Mann-Whitney test with the Bonferroni correction was used. For all statistical tests, the significance level was $p < 0.05$. Data were analyzed using Gandia Barbwin version 7.0.2110.5 and XLSTAT® version 21.04 of Microsoft Excel.

Results

Of the 105 experts initially contacted, 91 (86.7%) responded in the first round (57.1% male and 42.9% female). All experts are from urban areas. Consensus was reached on 46 (67.6%) of the 68 items proposed. Of the 22 (32.4%) for which consensus was not achieved, 18 items went to the second round and four were excluded from the clinical management block due to their descriptive nature. In the second round, the response rate was 75.2% ($n = 79$) and consensus was reached on six items (33.3%). Finally, after both rounds, the dropout rate of participation was only 13.19% ($n = 12$), and the consensus was achieved on 52 items (76.5%).

Supplementary Tables 1–4, show the results after both rounds by thematic block. Items 62, 63, 64, and 65 were excluded after the first round because the scientific committee considered that the answers to them might depend on the experts' work center. Supplementary Figure 1–4, show the degree of consensus by medical specialty of those items where there were statistically significant differences

between medical specialties for each thematic block of the questionnaire. The results of the experts who answered the questionnaire, primary care ($n = 19$), cardiology ($n = 19$), endocrinology ($n = 20$), internal medicine ($n = 16$), and nephrology ($n = 17$), showed that of the 46 items on which the experts agreed, there were 33 items with no discrepancies between the different medical specialties. However, discrepancies were found in 13 items, mainly in the group of primary care physicians. In the second round, the number of respondents in each specialty was as follows: primary care ($n = 16$), cardiology ($n = 17$), endocrinology ($n = 19$), internal medicine ($n = 13$), and nephrology ($n = 14$). The scientific committee issued a final report. The most relevant findings of the different areas evaluated are presented in detail.

Early Diagnosis and Prediabetes (Supplementary Table 1)

In this section, a high degree of agreement was observed among the different specialists regarding diabetes screening, periodic assessment of cardiovascular risk factors, screening for gestational diabetes, the use of metformin, and the use of glucagon-like peptide-1 receptor agonists (GLP-1 RA) in patients with overweight. To prevent complications in patients with T2D and multiple insulin doses, glucose monitoring with the Flash System should be recommended (funded by the NSH).

Referral Criteria (Supplementary Table 2)

The accepted scenarios for referral to the appropriate specialist were: unexplained dyspnea, suspected ischemic heart disease, new-onset "significant" electrocardiogram (ECG) abnormalities, estimated glomerular filtration rate (eGFR) <45 mL/min/1.73 m² or persistent albumin/creatinine ratio (ACR) >300 mg/g, poor metabolic control despite individualized therapy, poor blood pressure control and/or refractory hypertension, diagnostic doubt about the type of diabetes or difficult-to-control multipathological patients. Finally, all patients with T2D who have had a cardiovascular event in the past year should be referred to cardiac rehabilitation.

T2D Therapy and Comorbidities (Supplementary Table 3)

Pharmacological treatment in patients with uncomplicated T2D should start with metformin. Given an HbA1c $>9\%$ at the onset of T2D in patients with BMI ≥ 30 kg/m², the combination of metformin plus GLP-1 RAs or type 2 sodium-glucose co-transporter inhibitors (SGLT2i) will be evaluated. Despite good metabolic control, T2D treatment should be changed to another that provides greater cardio-renal benefits. In patients with T2D with cardiovascular disease and/or high CVR, SGLT2i and/or GLP-1 RAs should always be prescribed, and the drug should not be

withdrawn if it does not achieve a complete response in terms of weight and/or glycated hemoglobin (HbA1c) due to its protective benefit. In this context, the use of GLP-1 RAs (semaglutide, dulaglutide) should be prioritized for ischemic stroke and SGLT2i (dapagliflozin, empagliflozin) for patients with heart failure (HF), with or without T2D.

After initiation of an SGLT2i, monitoring of eGFR after 2–4 weeks is indicated in selected patients and in the elderly or those with an eGFR <60 mL/min/m². An initial transient drop in eGFR of 10–30% during follow-up is not a reason to discontinue it, as the benefit of this therapy persists. In patients with T2D and cardiovascular disease, the addition of a GLP-1 RA should be considered even if the HbA1c target has been achieved with SGLT2i. Treatment of T2D in patients with BMI ≥30 kg/m² and diabetic kidney disease should include GLP-1 RAs.

Regarding insulin therapy, degludec is the only next-generation basal insulin analog that has demonstrated cardiovascular safety in a clinical trial, and its use should be prioritized in patients with moderate to high and very high CVR. In terms of intensification, in a patient treated with basal or basal insulin plus regimen who does not achieve good glycemic control, a GLP-1 RA should be added if the BMI is ≥30 kg/m² before increasing the boluses of ultra-rapid insulin analogs. Adherence is a very important issue to be considered: any treatment prescribed for more than one year should be re-evaluated.

Clinical Management: Teleconsultation and Relationship with other Professionals (Supplementary Table 4)

There was a high degree of consensus that some proportion of the total appointments should be reserved for non-face-to-face consultations, either as part of the clinician's daily schedule or in the form of specific teleconsultation days. Clinical pathways are necessary as they allow for more comprehensive care of patients with T2D. Shared consultations between different specialties are also needed for patients with complex T2D. Finally, panelists agreed that hospital managers should be involved in the creation of teleconsultations, in the generation of indicators to evaluate telemedicine, and in the provision of support resources.

Agreement Between Different Specialists (Supplementary Figures 1–4)

Supplementary Figures 1–4 show the responses of each of the medical specialties, showing some disparities between them. Family physicians disagree with the recommendation to use OGTT for early detection of T2D in clinical practice. They agree with a non-pharmacological approach in the early stages of diabetes (Supplementary Figure 1). Supplementary Figures 2 and 3 show the results of “referral criteria”, and Supplementary Figure 4 of “treatment”.

Table 1 summarizes the main recommendations (key points) of this multidisciplinary agreement that can be translated into clinical practice and facilitate a more integrated approach to diabetes care by multidisciplinary teams.

Discussion

This is the first study that provides a series of recommendations for the management of T2D based on a consensus of specialists from different health care settings (primary care, cardiology, endocrinology, internal medicine, and nephrology) as assessed by Delphi techniques. These recommendations could facilitate the MDT approach to T2D. In addition, the results of the study revealed a lack of agreement between primary care physicians and other specialties on some issues, particularly in the management of T2D.

Early Diagnosis and Prediabetes

Regarding the management of patients with prediabetes in clinical practice, the ADA position statement includes HbA1c as a diagnostic test (diabetes treatment is indicated if levels are at least 6.5% or higher on two occasions) (25). In patients with prediabetes, some prevention programs have shown that intensive lifestyle modification and metformin reduce the incidence of T2D (26). In addition, GLP-1 RAs have been used in cases of intolerance to metformin. However, in Spain, the prescription of these types of drugs require a special license, and their use is authorized only in patients with T2D and obesity (BMI ≥30 kg/m²) (27,28). The expert panel agreed with the use of HbA1c for proactive screening and annual assessment of the metabolic status of patients with prediabetes. They also recommend a healthy lifestyle and the initial use of metformin. Regarding GLP-1 RA, the panel members consider that it should not be limited to patients with obesity.

In women with a history of gestational diabetes, postpartum check-ups should be performed according to ADA standards of care (25). Furthermore, the oral glucose tolerance test (OGTT), performed within the first six months after delivery, is the best test for identifying the risk of developing diabetes in women with gestational diabetes (29,30). The expert panel recommends that postpartum OGTT should be performed in all women with gestational diabetes, as well as evaluation of metabolic status every three years and control of CVR factors in women who have had this metabolic complication of pregnancy.

Diagnostic screening is a useful intervention to reduce the incidence of diabetes-related complications (31). The expert panel recommends screening in patients of any age if they are overweight or have obesity, in adults over 45 years of age, in women wishing to become pregnant who

Table 1. Clinical Translational Keypoints**Prediabetes and screening for diabetes**

Proactive HbA1c screening should be performed for early detection of DM^a

The metabolic status of patients with prediabetes should be assessed annually

In cases of high or very high CVR, in addition to changes in lifestyle, the use of pharmacological therapy should be recommended, and the most recommended starting treatment would be a SGLT2i

In addition to changes in lifestyle, the most recommended initial drug therapy would be an GLP-1 RA receptor in those patients with BMI ≥ 30 kg/m² (prescription funded by the NSH)

The financing of GLP-1 RAs by the NSH, should not be limited to patients with a BMI ≥ 30 kg/m²

In the prevention and early diagnosis of comorbidities, such as diabetic retinopathy, diabetic nephropathy, and heart failure

An annual ECG should be performed

The achievement of control objectives for CVR factors must be reviewed at least annually

Microangiopathy screening should be performed according ADA position statement

In patients with T2D and multiple insulin doses, glucose monitoring using the Flash System should be recommended (funded by the NSH)

Given the need to start treatment

In case of ischemic stroke, the use of GLP-1 RAs (semaglutide, dulaglutide) should be prioritized

Faced with HbA1c $>9\%$ at the onset of T2D in patients with BMI ≥ 30 kg/m², the combination of metformin + GLP-1 RAs + SGLT2i will be assessed

Patients with HF with or without T2D should receive SGLT2i (dapagliflozin, empagliflozin)

T2D treatment should be changed despite good metabolic control for another that provides greater cardiorenal benefit

Insulin degludec use in moderate-high and very high CVR patients should be prioritized

In selected patients and in elderly persons, or eGFR <60 mL/min/1.73m², monitoring of estimated GFR 2-4 weeks after initiation of an SGLT2i is indicated

Regarding the objective and management of treatments

Achieving the individualized control goal for HbA1c and CVR factors should be a priority

In patients with T2D with cardiovascular disease and/or high CVR, an SGLT2i and/or GLP-1 RAs should always be prescribed. The drugs should not be withdrawn if it does not achieve a complete response in terms of weight and/or HbA1c due to its protective benefit

In patients with T2D and cardiovascular disease, adding an GLP-1 RAs should be considered even if the HbA1c target has been achieved with SGLT2i

Treatment of patients with T2D, BMI ≥ 30 kg/m² and diabetic kidney disease should include an GLP-1 RAs

In patients with BMI ≥ 30 kg/m², the use of GLP-1 RAs should always be considered before starting insulinization

After the introduction of an SGLT2i, an initial transient fall in eGFR of 10-30% during follow-up is not a reason to withdraw it, since the benefit of this therapy persists

In a patient treated with a basal or basal insulin plus regimen that does not achieve good glycemic control, an GLP-1 RA will be added if the BMI ≥ 30 kg/m² before increasing the boluses of ultrarapid insulin analogs

Any treatment prescribed for more than 1 year should be re-evaluated (adherence)

Regarding teleconsultation and relationships with other professionals

Clinical pathways are necessary as they allow more comprehensive care of patients with T2D

Shared consultations between different specialties are necessary for complex T2D patients

Hospital management and directors should be involved in the creation of teleconsultations, in the generation of indicators to evaluate telemedicine and in the provision of support resources

BMI: Body mass index; CVR: Cardiovascular risk; DKD: Diabetic kidney disease; DM: Diabetes mellitus; ECG: Electrocardiogram; eGFR: estimated glomerular filtration rate; GLP-1 RAs: glucagon-like peptide-1 receptor agonists; HbA1c: Glycated hemoglobin; IQR: interquartile range; SGLT2i: type 2 sodium-glucose cotransporter inhibitor; N: No; NSH: National System of Health; T2D: Type 2 diabetes.

^aAt any age if overweight and with obesity; In all adults from 45 years of age (every 2 years); Women who desire to become pregnant or with obesity or with a CVR factor; Patients with a direct family history of T2D or early cardiovascular disease; All patients with an unexpected finding of complications that could be related to an unknown DM (albuminuria, altered eGFR, retinopathy ...)

have CVR factors, in patients with a direct family history of T2D or early cardiovascular disease, and in all patients with an unexpected finding of complications that may be related to unknown diabetes mellitus (DM).

Since DM is one of the most important systemic diseases worldwide and has serious consequences for human health, educational intervention programs and early diagnosis of comorbidities have been implemented (32,33). In this sense, the panel of experts recommends diet, exercise, and anti-smoking education. They advise annual electrocardiograms, monitoring of CVR factors, feet examination, and screening for eye and kidney diseases. In patients with T2D and multiple doses of insulin, glucose monitoring using the Flash System is recommended.

Referral Criteria

The severity of T2D is largely due to associated vascular complications, which can be disabling and even fatal (34). The expert panel recommends consultation in cases of dyspnea not explained by other causes (i.e., poor physical condition, anemia, or obesity), symptoms suggestive of ischemic heart disease, or abnormalities on an electrocardiogram and in patients with T2D who have had a cardiovascular event in the past year or who have poor blood pressure control and refractory hypertension. There is consensus on the indication for referral to cardiac rehabilitation in patients with T2D and a cardiovascular event in the previous year.

On the other hand, although referral to a nephrologist has not been thoroughly evaluated, it seems to influence the long-term survival of patients with T2D, reducing their mortality (35). The expert panel recommends referring patients with an eGFR <45 mL/min/1.73 m² or with persistent ACR >300 mg/g. Additionally, they advise referral to a specialist for patients with poor metabolic control despite individualized therapy, in cases where there is a diagnostic doubt about the type of diabetes, and for patients with multiple pathologies.

Treatment of T2D and Comorbidities

Metformin, except in cases of contraindication or intolerance, is the first pharmacological option for the treatment of T2D in most international guidelines and in the Spanish guidelines too, although the latest European CV prevention guidelines state that in the presence of CVD or damage in target organs, first-line treatment should include an SGLT2i or GLP-1 RA, regardless of metformin use (36–38). The expert panel recommends its use in patients with uncomplicated T2D. However, there are six oral and two injectable drug families available for combination therapy (36). Treatment with SGLT2i or GLP-1 RA has beneficial cardiovascular and renal effects in patients with T2D, although the kidney protection benefit is clearer with iSGLT2 (39,40). The expert panel recommends the use of GLP-1 RA in patients with stroke but considers that the special license required in the Spanish health system is an obstacle to the prescription of the drug in primary care. The expert panel recommends the combination of iSGLT2 with GLP-1 RAs and metformin in patients with obesity and diabetes with a HbA1c $>9\%$ and in patients with cardiovascular disease (whether diagnosed with diabetes or not). Although some associations even recommend the use of insulin when HbA1c $>8\%$, this level could raise more doubts as currently the use of insulin is being postponed, given the availability of these new drugs. In elderly patients with an eGFR less than 60 mL/min/1.73 m², eGFR monitoring for approximately four weeks is recommended. In general, the expert panel considers that all treatments should be oriented towards those that provide the greatest cardiorenal benefit.

In addition, the use of the next-generation drug insulin degludec in therapy has been shown to be safe in clinical trials (41,42). The expert panel considers that its use should be prioritized in patients with moderate-high and very high cardiovascular risk.

The goals and management of treatment in patients with T2D depend on the duration of the disease, the characteristics of the patients, and the individual risk of complications (43). The expert panel considers it a priority to establish individual targets for HbA1c and a comprehensive approach that includes the evaluation of CVR factors. They approved the use of GLP-1 RA in patients with T2D with cardiovas-

cular disease and the use of SGLT2i in patients with T2D with kidney disease. In patients with T2D, obesity, and diabetic kidney disease, the panel recommended the addition of a GLP-1 RA to the treatment. We explored the expert opinion on adding GLP-1 RAs even if the HbA1c target has been achieved with SGLT2i, as SGLT2 and GLP-1 are drugs that have demonstrated a morbimortality benefit in secondary prevention. The controversial issue to be debated with the experts is whether they should be included even if the patient is well controlled. Finally, the experts consider that all treatments and adherence to them should be re-evaluated if they have been prescribed for more than a year.

Clinical Management

Telemedicine is a tool for remote medical care that increases patient compliance and helps achieve therapeutic goals (44), either as a complement or as a replacement for usual care (45). The expert panel recommends reserving part of the daily schedule for the resolution of teleconsultations and that shared cross-sectional support consultations be held in the same time slot (with different specialties for patients with a complex T2D). They consider that it is necessary to have clinical pathways that allow a more comprehensive care of patients with T2D. Furthermore, hospital management and directors should be involved in the creation of teleconsultations, in the generation of indicators to evaluate telemedicine, and in the provision of support resources.

Consensus Differences Between Different Specialties

Few studies have been published comparing the opinions of family physicians and other specialists and the outcomes of diabetes management between different specialists (15,16). In our study, although most of the items reached a consensus among experts from different specialties, analysis by expert groups revealed significant differences between family physicians and other specialties. Regarding referral criteria, some items showed significant differences between family physicians and other clinical specialties. Cardiologists and nephrologists agreed on the need to refer patients with dyspnea when other causes do not explain it. Cardiologists, nephrologists, internists, and endocrinologists agreed on the need to refer patients with poor metabolic control despite being on individualized therapy. However, it should be noted that family care physicians do not usually refer patients in such situations, because of their usual management of the patient with diabetes. Regarding the management of T2D and comorbidities, there was a lack of agreement between family medicine, endocrinology, and internal medicine on some issues. The latter considers that a patient with T2D and cardiovascular disease being treated with a GLP-1 RA

should not have the drug withdrawn if they do not achieve a complete response (weight loss or improved glycemic control). Although there was no consensus, family care physicians and cardiologists agreed that the special license is a barrier to the prescription of GLP-1 RA in patients with obesity and/or renal failure (in case of primary prevention), the administration of low-dose pioglitazone in combination with SGLT2i or a GLP-1 RA is adequate.

The main reason why we find differences in the management of patients with T2D between different specialties is because of the type of patients each of them treats in their clinical practice. Other causes of these differences could be the lack of coordination between different specialties that care for the same patient, different levels of education and training in diabetes management among specialists, insufficient coordination between levels of care, or heterogeneous access to specific diagnostic, therapeutic, and control resources, the greater weight of the health administration recommendations, or differences in the consideration of the cost of medication in the therapeutic decision. According to these findings, the low-risk patient should not be referred to the specialist, because the management of the low-risk patient will be the same as that of the high-risk one, for example, to prescribe insulin treatment. It may be useful to stratify recommendations by patient type. The specialist should coordinate the management of the low-risk patient with the family care physician, who should be familiar with the management of the high-risk patient.

Study Strengths and Limitations

This study provides the opinion based on the experience of several groups of medical specialists, so the results are based on a greater amount of information. In addition, the Delphi methodology allows respondents to express themselves freely and not be influenced by group leaders. This study was subject to the limitations inherent to the Delphi method. Moreover, the use of a structured questionnaire could limit the study results. On the other hand, although all members of the expert panel had sufficient clinical experience, it is possible that the criteria used for selection did not adequately identify the panelists with the most experience in this field.

Conclusion

There is a lack of agreement between primary care physicians and other specialists on some issues, particularly on T2D management. Cardiologists and nephrologists agreed on the need to refer patients with dyspnea when other causes do not explain it. Cardiologists, nephrologists, internists, and endocrinologists agreed on the need to refer patients with poor metabolic control despite being on indi-

vidualized therapy, but primary care physicians do not usually refer patients in such situations. Primary care physicians and cardiologists agreed that the already mentioned special license is a barrier to the prescription of GLP-1 RA in patients with obesity and/or renal failure (in case of primary prevention).

Conflicts of Interest

The authors have no conflicts of interest to declare.

Funding

This research received an unrestricted grant from Novo Nordisk.

Acknowledgements

We thank the members of the expert panel for their collaboration: Aleix Cases Amenós, Alejandro Berenguel Sében, Alfonso Valle, Alfredo Luis Michán Doña, Amparo Marco, Antonio Pérez Pérez, Beatriz Avilés Bueno, Beatriz Fernández Fernández, Belén Benito Badorrey, Carlos Escobar Cervantes, Clara García Carro, Cristina Tejera Pérez, Cristóbal Jesús Morales Portillo, Didac Mauricio Puente, Elías Delgado, Enrique Carretero Anibarro, Esteban Jodar Gimeno, Eva María Pereira López, Eva Solá Izquierdo, Fernando Álvarez Guisasaola, Fernando Gómez-Peralta, Flora López Simarro, Francisco Javier Escalada San Martín, Francisco Javier Ortega Ríos, Francisco Javier Ena Muñoz, Javier Díez Espino, Javier Mora Robles, Javier Torres Llergo, Joan Barrot De La Puente, Jonay Pantoja Pérez, Jorge Navarro Pérez, José Antonio Alarcón Duque, José Ignacio Comago Delgado, José Luis Górriz Teruel, José Luis Pardo Franco, José Luis Torres Baile, José Manuel Mata Cases, José María Fernández Rodríguez, José María Gámez Martínez, José Pablo Miramontes González, Josep Franch Nadal, Josep Vidal Cortada, Juan Cosin Sales, Juan Carlos Ferrer García, Juan Francisco Merino Torres, Juan Francisco Navarro González, Juan José Gorgojo Martínez, Juana Carretero Gómez, Judith López Fernández, Julio Sagredo Pérez, Kátia López Revuelta, Luis Ávila Lachica, Luis Miguel Pérez Belmonte, Manuel Antonio Botana López, María Ángeles Goicoechea Diezhandino, María Concepción Belló Mora, María De San Miguel Márques Vidas, María Del Pilar Mazón Ramos, María Dolores López Carmona, María Rosa Fernández Olmo, Marta Romero Sánchez, Meritxell Ibernón Vilaró, Miguel Ángel Corrales González, Miriam Sandín Rollán, Nery Sablón González, Noemí Esparza Martín, Nuria García Fernández, Nuria Muñoz Rivas, Pedro Mezquita Raya, Pedro Jesús Rozas Moreno, Pedro Pablo Casado Escribano, Pilar Buil Cosiales, Rebeca Reyes García, Regina Dalmau González-Gallarza, Rosario Iglesias González, Rosario Serrano Martín, Santiago Tofé

Povedano, Sara Artola Menéndez, Secundino Cigarran Guldris, Vicente Ignacio Arrarte Esteban We thank Novo Nordisk SA for an unconditional grant.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.arcmed.2023.102923](https://doi.org/10.1016/j.arcmed.2023.102923).

References

- Davies MJ, Aroda VR, Collins BS, et al. Management of Hyperglycemia in Type 2 Diabetes, 2022. A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). *Diabetes Care* 2022;45:2753–2786. doi:10.2337/dci22-0034.
- Bandello F, Toni D, Porta M, et al. Diabetic retinopathy, diabetic macular edema, and cardiovascular risk: the importance of a long-term perspective and a multidisciplinary approach to optimal intravitreal therapy. *Acta Diabetol* 2020;57:513–526.
- van Sloten TT, Sedaghat S, Carnethon MR, et al. Cerebral microvascular complications of type 2 diabetes: stroke, cognitive dysfunction, and depression. *Lancet Diabetes Endocrinol* 2020;8:325–336.
- Helou N, Talhouedec D, Zumstein-Shaha M, et al. A Multidisciplinary Approach for Improving Quality of Life and Self-Management in Diabetic Kidney Disease: A Crossover Study. *J Clin Med* 2020;9(7).
- Whisstock C, Volpe A, Ninkovic S, et al. Multidisciplinary Approach for the Management and Treatment of Diabetic Foot Infections with a Resorbable, Gentamicin-Loaded Bone Graft Substitute. *J Clin Med* 2020;9(11).
- Zgonis T. The Diabetic Charcot Foot and Ankle: A Multidisciplinary Team Approach. Vol. 34 2017 xi–xii.
- Wang A, Lv G, Cheng X, et al. Guidelines on multidisciplinary approaches for the prevention and management of diabetic foot disease (2020 edition). *Burn trauma* 2020;8 tkaa017.
- Román-Pintos LM, Villegas-Rivera G, Rodríguez-Carrizalez AD, et al. Diabetic Polyneuropathy in Type 2 Diabetes Mellitus: Inflammation, Oxidative Stress, and Mitochondrial Function. *J Diabetes Res* 2016;2016:3425617.
- Del Río Solá ML, Puerta CV. Effectiveness of the Combined Treatment of Functional Electrical Stimulation and Deambulation in Diabetic Arteriopathy. *Ann Vasc Surg* 2019;61:83–90.
- Tan HQM, Chin YH, Ng CH, et al. Multidisciplinary team approach to diabetes. An outlook on providers' and patients' perspectives. *Prim Care Diabetes* 2020;14:545–551.
- Hamdy O, Ashrafzadeh S, Mottalib A. Weight Management in Patients with Type 2 Diabetes: a Multidisciplinary Real-world Approach. *Curr Diab Rep* 2018;18:66.
- Jiao FF, Fung CSC, Wong CKH, et al. Effects of the Multidisciplinary Risk Assessment and Management Program for Patients with Diabetes Mellitus (RAMP-DM) on biomedical outcomes, observed cardiovascular events and cardiovascular risks in primary care: a longitudinal comparative study. *Cardiovasc Diabetol* 2014;13:127.
- Huizing E, Schreve MA, Kortmann W, et al. The effect of a multidisciplinary outpatient team approach on outcomes in diabetic foot care: a single center study. *J Cardiovasc Surg (Torino)* 2019;60:662–671.
- Dankoly US, Vissers D, El Farkouch Z, et al. Perceived Barriers, Benefits, Facilitators, and Attitudes of Health Professionals Towards Multidisciplinary Team Care in Type 2 Diabetes Management: A Systematic Review. *Curr Diabetes Rev* 2021;17:e111020187812.
- Zoberi KA, Salas J, Morgan CN, et al. Comparison of Family Medicine and General Internal Medicine on Diabetes Management. *Mo Med* 2017;114:187–194.
- Chou PL, Chiang IH, Lin CW, et al. Newly Diagnosed Type 2 Diabetes Care between Family Physicians, Endocrinologists, and Other Internists in Taiwan: A Retrospective Population-Based Cohort Study. *J Pers Med* 2022;12:461.
- Leinung MC, Gianoukakis AG, Lee DW, et al. Comparison of diabetes care provided by an endocrinology clinic and a primary-care clinic. *Endocr Pract* 2000;6:361–366.
- Cornell S. Comparison of the diabetes guidelines from the ADA/EASD and the AACE/ACE. *J Am Pharm Assoc* (2003) 2017;57:261–265. doi:10.1016/j.japh.2016.11.005.
- Reyes-García R, Moreno-Pérez Ó, Tejera-Pérez C, et al. Document on a comprehensive approach to type 2 diabetes mellitus. *Endocrinol Diabetes Nutr* 2019;66:443–458.
- Vinyoles-Bargalló E, Galgo-Nafria A, González-Albarrán O, et al. Consenso multidisciplinar sobre el manejo individualizado de la diabetes en atención primaria. Estudio ICANDAP [Delphi consensus on the individualised management of diabetes in primary care. ICANDAP study]. *Semergen* 2017;43:540–549.
- Carrasco-Sánchez FJ, Fernández-Rodríguez JM, Ena J, et al. Medical treatment of type 2 diabetes mellitus: Recommendations of the Diabetes, Obesity and Nutrition Group of the Spanish Society of Internal Medicine. *Rev Clin Esp* 2020 S0014-S2565:30175-2.
- Castro Conde A, Marzal Martín D, Arrarte V, et al. Abordaje integral del paciente con diabetes mellitus tipo 2 y enfermedad cardiovascular o de muy alto riesgo cardiovascular. *REC Cardio Clinics* 2019;54:183–192.
- Campuzano Ruiz R, Castro Conde A, Arrarte Esteban V, et al. Selección de lo mejor de 2020 en riesgo vascular y rehabilitación cardíaca. [A selection of the best of 2020 in vascular risk and cardiac rehabilitation]. *REC CardioClinics* 2021;56:27–34.
- Hasson F, Keeney S, McKenna H. Research guidelines for the Delphi survey technique. *J Adv Nurs* 2000;32:1008–1015.
- American Diabetes Association. 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes-2021. *Diabetes Care* 2021;44(Suppl 1):2182 S15–S33. Erratum in: *Diabetes Care* 2021;44.
- Moin T, Martin JM, Mangione CM, et al. Choice of Intensive Lifestyle Change and/or Metformin after Shared Decision Making for Diabetes Prevention: Results from the Prediabetes Informed Decisions and Education (PRIDE) Study. *Med Decis Making* 2021;41:607–613.
- Gorgojo Martínez JJ, Palomares Ortega R. ¿A quién y cuándo plantear el tratamiento con liraglutida? [To whom and when to consider treatment with liraglutide?]. *Endocrinol y Nutr* 2013;60:15–20.
- Asano M, Sekikawa A, Kim H, et al. Pharmacokinetics, safety, tolerability, and efficacy of cotadutide, a glucagon-like peptide-1, and glucagon receptor dual agonist, in phase 1 and 2 trials in overweight or obese participants of Asian descent with or without type 2 diabetes. *Diabetes Obes Metab* 2021;23:1859–1867.
- Metzger BE, Coustan DR. Summary and recommendations of the Fourth International Workshop-Conference on Gestational Diabetes Mellitus. The Organizing Committee., *Diabetes care*. United States 1998;21(Suppl 2):B161–B167.
- Göbl CS, Bozkurt L, Prikoszovich T, et al. Early possible risk factors for overt diabetes after gestational diabetes mellitus. *Obstet Gynecol* 2011;118:71–78.
- Suchitra MR, Jaiganesh K, Parthasarathy S. Diabetic Profile- Screening of HBA1C - A Random Community Assessment. *J Clin Diagn Res* 2013;7:2200–2202.
- Corser WD. Increasing comorbidity with diabetes in the community: diabetes research challenges. *Diabetes Res Clin Pract* 2013;100:173–180.
- Shirvani T, Javadi Z, Azimi S, et al. Community-based educational interventions for prevention of type II diabetes: a global systematic review and meta-analysis. *Syst Rev* 2021;10:81.

34. Wolde HF, Atsedeweyen A, Jember A, et al. Predictors of vascular complications among type 2 diabetes mellitus patients at University of Gondar Referral Hospital: a retrospective follow-up study. *BMC Endocr Disord* 2018;18:52.
35. Anees M, Hussain Y, Ibrahim M, et al. Outcome of Chronic Kidney Disease Patients on the Basis of Referral to Nephrologist: A One-Year Follow-up Study. *J Coll Physicians Surg Pak* 2018;28:304–307.
36. American Diabetes Association. 9Pharmacologic Approaches to Glycemic Treatment: Standards of Medical Care in Diabetes-2021. *Diabetes Care* 2021;44(Suppl 1):S111–S124. doi:10.2337/dc21-S009.
37. Scheen AJ. SGLT2 Inhibitors as Add-On Therapy to Metformin for People with Type 2 Diabetes: A Review of Placebo-Controlled Trials in Asian versus Non-Asian Patients. *Diabetes Metab Syndr Obes* 2020;13:2765–2779.
38. Álvarez-Guisasola F, Orozco-Beltrán D, Cebrián-Cuenca AM, et al. Management of hyperglycaemia with non-insulin drugs in adult patients with type 2 diabetes. *Aten primaria* 2019;51:442–451.
39. Kristensen SL, Rørth R, Jhund PS, et al. Cardiovascular, mortality, and kidney outcomes with GLP-1 receptor agonists in patients with type 2 diabetes: a systematic review and meta-analysis of cardiovascular outcome trials. *Lancet Diabetes Endocrinol* 2019;7:776–785.
40. Kanie T, Mizuno A, Takaoka Y, et al. Dipeptidyl peptidase-4 inhibitors, glucagon-like peptide 1 receptor agonists and sodium-glucose co-transporter-2 inhibitors for people with cardiovascular disease: a network meta-analysis. *Cochrane Database Syst Rev* 2021;10:CD013650.
41. Wysham C, Bhargava A, Chaykin L, et al. Effect of Insulin Degludec vs Insulin Glargine U100 on Hypoglycemia in Patients With Type 2 Diabetes: The SWITCH 2 Randomized Clinical Trial. *JAMA* 2017;318:45–56.
42. Aso Y, Takada Y, Tomotsune K, et al. Comparison of insulin degludec (IDeg)/insulin Aspart (IAsp) co-formulation therapy twice-daily with free combination of GLP-1 receptor agonist liraglutide plus insulin degludec in Tochigi: IDEAL Trial. *Int J Clin Pract* 2021;75:e13734.
43. Melmer A, Laimer M. Treatment Goals in Diabetes. *Endocr Dev* 2016;31:1–27.
44. Rasmussen OW, Lauszus FF, Loekke M. Telemedicine compared with standard care in type 2 diabetes mellitus: A randomized trial in an outpatient clinic. *J Telemed Telecare* 2016;22:363–368.
45. Lee SWH, Chan CKY, Chua SS, et al. Comparative effectiveness of telemedicine strategies on type 2 diabetes management: A systematic review and network meta-analysis. *Sci Rep* 2017;7:12680.