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ORIGINAL ARTICLE

# Management of newly diagnosed patients with type 2 diabetes: what are the attitudes of physicians? A SUBITO!AMD survey on the early diabetes treatment in Italy

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**Abstract** Early intensive therapy in type 2 diabetes can prevent complications. Nevertheless, metabolic control is often sub-optimal in newly diagnosed patients. This web-based survey aimed to evaluate opinions of physicians about treatment, priorities, and barriers in the care of patients first referred to diabetes clinics. Data on physician attitudes toward therapeutic preferences for two clinical case models (same clinical profile, except HbA1c levels of 8.6 and 7.3% at the first access, respectively) were collected. Participants were asked to rank from 1 (most important) to 6 (least important) a list of priorities and barriers associated with the care of new patients. Overall, 593 physicians participated. In both case models, metformin and education were primary options, although their combination with other classes of drugs varied substantially. Main priorities were "to teach the patient how to cope with the disease" and "to achieve HbA1c target"; main barriers were "lack of time" and "long waiting list". At multivariate analyses, physicians from the South of Italy had a twofold higher likelihood to attribute a rank 1–2 to organizational barriers than those operating in the North (South vs. North: OR: 2.4; 95% CI 1.4–4.1; Center vs. North: OR: 2.4; 95% CI 0.9–3.2). In the absence of a widely accepted evidence-based therapeutic algorithm driving the therapeutic choices according to the patient characteristics, prescriptions vary according to physician preferences. Education is perceived as a key-strategy, but organizational barriers and geographic disparities are an obstacle. These findings can drive new strategies to reduce clinical inertia, attitudes variability, and geographic disparities.

**Keywords** Physician attitudes · Type 2 diabetes · Recent diagnosis · Therapeutic options · Priorities of diabetes care · Geographic variability

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## Introduction

Strategies and goals of diabetes mellitus treatment have evolved rapidly in recent years. Randomized clinical trials such as DCCT-EDIC [1], UKPDS 80 [2], and STENO 2 [3] have consistently reported a better prognosis in patients who begin intensive therapy early after diagnosis than in those who achieve better HbA1c levels later in the course of treatment; on the other hand, findings from basic science suggest that a prolonged exposure to high blood glucose irreversibly damages beta-cells as a consequence of the oxidative stress [4, 5]. This body of evidence has been translated into the clinical message of pursuing optimal metabolic management since the onset of the disease [6].

In spite of these premises, to keep an adequate metabolic control is still a challenge in many patients with type 2 diabetes. A recent report on quality indicators of diabetes

care in Italy shows that over 50% of patients with type 2 diabetes fail to meet the metabolic target, and approximately 30% of newly diagnosed patients have HbA1c >8.0% [7]. Among the many factors suggested to explain the failure to achieve recommended goals, clinical inertia is increasingly recognized as a primary cause of poor glycemic control in T2DM [8–10]. In patients on monotherapy with metformin or sulfonylurea, a change in therapy is initiated only when HbA1c levels rise to over 8.5%, while the time required for therapy intensification ranges from 2 to 3 years, despite HbA1c levels above goal [11–13].

On the other hand, opinions on the most appropriate therapeutic algorithm to be adopted in these patients are controversial. The ADA/EASD consensus statement for the medical management of hyperglycemia in patients with type 2 diabetes [14] recommends the initial treatment with metformin monotherapy and lifestyle modification, followed by addition of basal insulin or a sulfonylurea if glycemic goals are not met; nevertheless, this approach has been criticized [15] since it could limit the use of the other glucose-lowering therapies as options to individualize and optimize care with a view to sustained control of blood glucose and reduction of both diabetes complications and cardiovascular risk.

In the absence of clear standards of care for therapy intensification, the aim of this work was to investigate attitudes and opinions of physicians toward the care of newly diagnosed patients with type 2 diabetes.

## Materials and methods

A web-based survey was launched by the Italian Associazione Medici Diabetologi scientific society (AMD). It was part of a larger multifaceted initiative called "SUBITO!AMD" aiming to collect data on metabolic control and cardiovascular risk factors of patients with diabetes first referred to specialist care and to identify new strategies enabling the reduction of clinical inertia.

The survey has been available on the AMD website between December 2009 and February 2010. Initiative was promoted through communications to all AMD members and during the meetings of the scientific society. Participation was free and responders were anonymous. The survey included three sections:

1. Characteristics of responders: gender, age, speciality, i.e. diabetologist/endocrinologist/geriatrist/internist, if head of the diabetes clinic, and geographic area, i.e. North, Center, or South of Italy.
2. Attitudes of responders to treat patients with a diabetes duration <12 months and different levels of metabolic control and cardiovascular risk factors: two clinical case models with the same characteristics except HbA1c levels were presented. In more details, case models were two 62-year-aged patients with a body mass index (BMI) of 28.3 kg/m$^2$, fasting blood glucose of 220 mg/dl, diabetes duration of 1 year, treated with twice daily administration of glibenclamide and metformin (2.5 + 400 mg), without any other cardiovascular risk factors or complication. The case A had HbA1c levels of 8.6%, while the case B had mean HbA1c levels of 7.3%.
   For both cases, preferences about the therapeutic prescription and the timing of subsequent visit were elicited. As for the therapeutics prescription, the combination between the following treatments could be selected: metformin, sulphonylurea, glinide, thiazolidinedione, DPP-IV inhibitor, GLP-1 analog, basal insulin, prandial insulin, education; as for the timing of the subsequent visit, the responder could select one of the following options: after 1, 2, 6, 12, or >18 months, or "I leave the decision to the general practitioner".
3. Priorities and barriers in the care of patients at their first access to specialist care: physicians ranked from 1st (the most important) to 6th (the least important) a list of six priorities and six barriers.

### Statistical analysis

Characteristics of the responders were expressed as mean ± standard deviation or percentages (%).

Results of the survey were expressed as frequencies. Opinions on priorities and barriers were expressed as mean ranks (±standard deviation); the lower the mean, the higher the importance attributed to the item.

Multivariate logistic regression models adjusted for age, gender, speciality, leadership, and geographic area of the responders were applied to identify those physician characteristics associated with an increased likelihood to attribute a rank 1–2 to each priority and barrier. Furthermore, three composite outcomes were also tested: the first one was obtained by the combination of those priorities and barriers focused on the educational aspects (C1), the second one derived from the combination of those items focused on the organizational aspects (C2), and the third one derived from the combination of those items focused on the clinical targets (C3). Results of the multivariate analyses are expressed as odds ratio and 95% confidence interval.

## Results

### Characteristics of responders

Overall, 593 physicians participated in the initiative; 59.4% were males and mean age ± standard deviation was

51.1 ± 7.1 years; 51.1% were head of the diabetes clinic. Of the participants, 76.6% were diabetologists, 15.0% were internists, 7.4% were endocrinologists, and 1.0% were geriatricians. All geographic areas of Italy were covered: 39.2% of participants were from the North of Italy, 16.6% from the Center, 44.0% from the South.

As for the case A, 82% of the participants confirmed the use of metformin, while 11.5% confirmed the use of sulphonylurea. Insulin was chosen by 22.6%, while education was selected by 68.0%. The selection of any other class of oral agents ranged from 6.8% (glinides) to 17.5% (thiazolidinedione). In terms of global therapeutic strategy, within a list of 58 different combinations, the most frequent five patterns of treatments were: metformin plus education (17.5%), metformin plus DPP-IV inhibitors plus education (7.9%), metformin plus basal insulin plus education (7.8%), metformin plus thiazolidinedione plus education (7.6%), and metformin plus sulphonylurea plus education (5.4%). The subsequent visit was scheduled after 6 months by 43.5% of responders and after 3 months by 40.5%; in addition, 10% of responders would plan the visit after 12 months, 3.7% after 1 month, 0.5% after 18 months, and 1.8% would leave the decision to the general practitioner.

As for the case B, 80% of the participants confirmed the use of metformin, while 3.7% confirmed the use of sulphonylurea. The selection of any other class of oral agents ranged from 2.0% (GLP-1 analog) to 12.5% (DPP-IV inhibitor). Insulin was chosen by 0.6% of the responders, while education was selected by 68.5%. In terms of global therapeutic strategy, within a list of 33 different combinations, the most frequent five patterns of treatments were: metformin plus education (37.6%), metformin only (18.0%), education only (13.6%), metformin plus DPP-IV inhibitor plus education (4.9%), and metformin plus DPP-IV inhibitor (4.4%). The subsequent visit was scheduled after 6 months by 52.1% of responders, after 12 months by 23.1%, after 3 months by 16.7%; 0.7% of responders planned the visit after 1 month and 2.0% after 18 months, while 5.4% left the decision to the general practitioner.

Table 1 shows the distribution of priorities and barriers in each rank and the related mean rank.

Table 2 shows the results of the multivariate analyses. As for the priorities, female physicians had a twofold higher likelihood to assign a high priority to the control of cardiovascular risk factors. No other significant associations were found between physicians characteristics and choice of the priorities.

As for the barriers, physicians operating in the South of Italy had a twofold higher likelihood to select "lack of time" as a main barrier, and about 50% lower likelihood to consider "lack/insufficiency of multidisciplinary team" and "patient unwillingness to be involved in diabetes care" as main barriers as compared to physicians operating in the North.

**Table 1** Distribution of the ranks attributed to priorities and barriers in the care of patients first referred to specialist care and mean rank for each item. The lower the mean, the higher the recognized importance of the item

| | | Ranks | | | | | | Mean ± SD |
|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | |
| | Priorities | | | | | | | |
| P1 | To teach the patient how to cope with the disease | 62.9 | 14.9 | 7.3 | 7.4 | 3.2 | 4.4 | 1.86 ± 1.40 |
| P2 | To achieve HbA1c target | 16.2 | 24.5 | 32.0 | 13.7 | 9.8 | 3.9 | 2.88 ± 1.33 |
| P3 | To educate the patient to self-manage the disease | 17.2 | 34.2 | 12.5 | 10.6 | 11.8 | 13.7 | 3.07 ± 1.68 |
| P4 | To avoid weight gain | 0.8 | 11.0 | 16.9 | 18.9 | 26.5 | 26.0 | 4.37 ± 1.36 |
| P5 | To avoid hypoglycemia | 1.7 | 7.4 | 16.4 | 24.5 | 24.1 | 26.0 | 4.40 ± 1.32 |
| P6 | To control lipid profile and blood pressure | 1.2 | 8.1 | 15.0 | 25.0 | 24.6 | 26.1 | 4.42 ± 1.30 |
| | Barriers | | | | | | | |
| B1 | Lack of time | 39.8 | 18.7 | 15.2 | 11.6 | 5.7 | 8.9 | 2.52 ± 1.64 |
| B2 | Long waiting list in scheduling the second visit | 17.5 | 19.6 | 16.2 | 14.5 | 15.7 | 16.5 | 3.41 ± 1.73 |
| B3 | Bureaucracy (medical prescriptions, therapeutic plans and other documents) | 12.0 | 17.2 | 23.8 | 20.1 | 15.7 | 11.3 | 3.44 ± 1.52 |
| B4 | Lack/insufficiency of multidisciplinary diabetes team for education | 9.6 | 19.2 | 15.2 | 16.5 | 21.1 | 18.4 | 3.75 ± 1.64 |
| B5 | Patient unwillingness to be involved in diabetes care | 13.0 | 13.5 | 13.3 | 19.6 | 16.5 | 24.1 | 3.85 ± 1.72 |
| B6 | Lack/insufficiency of personnel dedicated to patient training on therapy management and blood glucose self-monitoring | 8.1 | 11.8 | 16.4 | 17.7 | 25.3 | 20.7 | 4.03 ± 1.57 |

**Table 2** Results of the multivariate analyses performed to identify correlates of the selected outcome measures. Only statistically significant odds ratios (95% CI) are displayed (RC = reference class)

| | Priorities | Barriers | | | | | Composite outcome | |
|---|---|---|---|---|---|---|---|---|
| | P6 | B1 | B2 | B4 | B5 | B6 | C1 | C3 |
| Female | 2.32 | | 0.6 | | | | | 0.50 |
| | (1.22–4.43) | | (0.4–0.85) | | | | | (0.30–0.85) |
| Male (RC) | 1.0 | | 1.0 | | | | | 1.0 |
| Age | | | 1.03 | | | 0.97 | 0.95 | 1.04 |
| | | | (1.01–1.06) | | | (0.94–1.0) | (0.90–0.99) | (1.01–1.07) |
| Area South | | 2.30 | | 0.54 | 0.51 | | | 2.4 |
| | | (1.59–3.34) | | (0.36–0.80) | (0.34–0.77) | | | (1.4–4.1) |
| Area Center | | 1.03 | | 0.62 | 0.88 | | | 1.7 |
| | | (0.65–1.64) | | (0.37–1.04) | (0.53–1.46) | | | (0.9–3.2) |
| Area North (RC) | | 1.0 | | 1.0 | 1.0 | | | 1.0 |

No significant correlations were found for P1–P4, B3, and C3

The two variables "Leader of the diabetes clinic YES/NO" and "diabetologist/other specialty" were not significantly related to any outcome

The likelihood to attribute a high rank to the barrier "long waiting list" increased by 3% for each year of age increase and was 40% lower in female than in male physicians.

As for the composite outcomes, the likelihood to attribute a high rank to the educational aspects (C1) decreased by 5% for each year of age increase.

The likelihood to assign a high rank to the organizational aspects (C2) was 50% lower in female physicians than in males and 4% higher for each year of age increase; geographic area was strongly associated with the organizational composite outcome, physicians practicing in Southern Italy being 2-times more likely to attribute a high rank to the organizational aspects than those practicing in Northern Italy.

No significant associations were found between physicians characteristics and the composite outcome related to the clinical aspects (C3).

## Discussion

AMD has 2,149 members, of whom 593 (one-fourth) participated to the survey. Characteristics of actual responders did not differ from the overall potential sample in terms of distribution by gender: in fact, in the two populations, the percentage of male physicians was of 59.4 and 59.6%, respectively. In terms of geographic area, only a small difference was documented for the percentage of responders from central and southern Italy. In fact, AMD members and responders to the survey were distributed by geographic area as follows: 39.0 versus 39.2% from Northern Italy, 21.3 versus 16.7% from Central Italy, and 39.7 versus 44.0% from Southern Italy.

Opinions about the treatment of the two case models varied substantially, as documented by the wide range of selected therapeutic options. In both cases, education was recognized as a key-strategy for initiating the care of patients first referred to diabetes clinics. Metformin is confirmed as a first-choice drug irrespectively of the level of metabolic control. Sulphonylureas tended to be replaced with other classes of drugs, but the choice of the new drugs was related to the attitudes and opinions of the physicians, in the absence of a widely accepted, evidence-based therapeutic algorithm. Insulin was the only option selected by a large group of respondents (about 1/4 of the sample) in case of HbA1c levels of 8.6%. Combinations of treatments including DPP-IV inhibitors were selected as the main option in the care of new patients with slightly elevated HbAc levels, although many other possible therapeutic patterns were identified. Variability in scheduling of the subsequent visit was also marked, presumably not only according to the attitude of the physician but also to the organizational resources of the diabetes clinic and to the level of implementation of the chronic care model shared with the general practice that in Italy is well established in some areas [16] and poor in others.

"To teach the patient how to cope with the disease" was considered the major priority, followed by "to achieve HbA1c target" and "to educate the patient to self-manage the disease", confirming the key role of education in the management of the disease, in association with the achievement of the HbA1c target. "Lack of time" was judged as the major barrier, followed by "long waiting list" and "bureaucracy", suggesting the perceived need of a different organization to facilitate patient access to diabetes clinics. The complexity of the educational training [17, 18] and the perception of organizational barriers render support

for diabetes patient education infrequent and erratic. To this respect, the implementation of chronic care models centered on the patient and shared with the general practice could help in optimizing the time dedicated to each patient, leaving more room for educational activities. Organizational barriers were more strongly perceived in southern Italy, where diabetes clinics have a lower structural/organizational complexity and often lack a multidisciplinary team. Variation in the perception of organizational barriers could be influenced by unequal availability of resources and different healthcare policies in the different areas of Italy. This picture is in contrast with the evidence that multi professional team and specific diabetes health education programs are significantly associated with improved glycemic control and, therefore, to a most effective prevention of the complications and reduction of the financial burden of the disease [19]. In the absence of specific interventions to reduce disparities of the current care, clinical inertia represents a key problem in many healthcare settings [20].

Limits of the study need to be discussed. The opt-in study design implies that results of the study reflect the opinions of its participants; they could be systematically different from the opinions of non-responders. Nevertheless, the large number of physicians involved and the comparability of responders and overall sample of the AMD members provides reassurance regarding the generalizability of the results.

In conclusion, this AMD web-based survey calls for new actions aiming to render the diabetes care more homogenous, while reducing clinical inertia. The production by AMD of a new algorithm driving the therapeutic choices according to the patient's phenotype is now undergoing. The next step will be the implementation of a chronic care model to be designed in collaboration with the government health agencies and other scientific societies involved in the care of diabetes, aiming to reduce the organizational barriers and render the approach to the disease more timely, effective, and cost-saving.

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