Association of the prognostic value of primary care physicians and morbimortality in diabetic patients

Asociación del valor pronóstico de los médicos de atención primaria y morbimortalidad en pacientes diabéticos

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Abstract

Introduction: Type 2 diabetes mellitus is the most common endocrine disease. It is unclear whether physician evaluation is valuable prognostic information.
Objective: To determine the prognostic value of physician assessment of compliance and mortality in diabetic patients.
Methods: A prospective cohort study was conducted with patients with type 2 DM under medical treatment in 11 participating practices between April and June 2020.
Results: Patients whose compliance was considered “very poor” at baseline showed 1-year mortality of 13.1%.
Conclusions: assessment of patient compliance by the physician is a valuable prognostic marker among patients with type 2 diabetes.

Palabras clave: diabetes mellitus, primary care, mortality, compliance source: DeCS
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Resumen
Introducción:La diabetes mellitus tipo 2 es la enfermedad endocrina más común. No está claro si la evaluación de los médicos es una información de pronóstico valiosa.
Objetivo: Determinar el valor pronóstico de la evaluación de los médicos sobre cumplimento y mortalidad en pacientes diabéticos.
Método:Se realizó un estudio de cohorte prospectivo con los pacientes con DM tipo 2 bajo tratamiento médico en 11 prácticas participantes entre abril y junio de 2020.
Resultados:Los pacientes cuyo cumplimiento se consideró al inicio como "muy malo" mostraron una mortalidad a 1 año del 13,1 %.

Conclusiones: la evaluación del cumplimiento del paciente por parte del médico es un marcador pronóstico valioso entre los pacientes con diabetes tipo 2.

Palabras clave : diabetes mellitus, atención primaria, mortalidad, cumplimiento fuente : DeCS

Introduction

Type 2 diabetes mellitus (DM) is the most common endocrine disease in developed countries and its prevalence is increasing worldwide. Patients with type 2 diabetes have approximately three times the risk of all cardiovascular diseases and their risk of death from all causes is increased by 75% compared to patients without diabetes(1). Morbidity and mortality resulting from complications of type 2 diabetes, such as microvascular and macrovascular disease, cause considerable costs to the individual and society and require special care and attention(2). It is well known that the likelihood of diabetic complications, and subsequently the risk of dying, in patients with diabetes is associated with glycemic control, adherence to treatment, and successful self-management. It remains unclear whether physicians' assessment of patient adherence is valuable prognostic information to identify patients at increased risk of subsequent complications or death, or reflects the measurement of various treatment parameters, such as glycosylated hemoglobin (HbA1C) or other laboratory markers(3). However, given that most patients are treated in a primary care setting, this information would be critical and would eventually identify subjects needing improved diabetes therapy and help guide preventive measures(4).

The objective of this prospective cohort study involving all patients with type 2 diabetes who were under medical treatment in primary care practices of family physicians in a geographically defined region was to investigate various aspects and the prognostic value of physicians' assessment of patient compliance for all-cause mortality during a 1-year follow-up period.

Method

A prospective cohort study included all patients with known type 2 DM, older than 40 years, who were under medical treatment in one of the 11 participating general practitioner practices working in primary care in a region of the Central Ecuadorian Sierra between April and June 2020. In addition to patients who presented at general practice consultations, including all patients who were seen in residencies or visited at home by participating physicians. DM was defined as having met the following diagnostic criteria: resting blood glucose > 200 md/dl or fasting blood glucose ≥ 126 mg/dl according to the American Diabetes Association diagnostic criteria. Fifteen general practitioners working in the 11 general practices were included. This study was approved by the Universidad Regional Autónoma de Los Andes (UNIANDES).

This study was part of the quality assurance program of the participating practices. All data collection procedures and diagnostic criteria were defined in a manual and all practice teams were trained accordingly before conducting the study. All patients attending the GP practices were asked to complete a standardized questionnaire on their medical history, lifestyle habits, and health-related quality of life. In addition, physicians completed a separate questionnaire with details on DM diagnosis, treatment, existing comorbidity (as documented in the patient's medical records), most recent laboratory results, and other patient-related information for patients who presented for surgeries, as well as for patients who were cared for in nursing homes or visited at home. Participation was voluntary and all information was collected anonymously during the patient's office visit. The patient's informed consent was documented on the physician's questionnaire. The study was conducted in compliance with the Declaration of Helsinki.

Each physician was asked to evaluate each patient's compliance by asking, "How would you evaluate this patient's compliance?" The response was posed on a four-point Likert-type scale (very well, fairly well, fairly poorly, very poorly). In addition, once all patients were included, we conducted a qualitative survey among physicians using a standardized questionnaire to determine which aspects for evaluating patient compliance were of strong or very strong importance in making this assessment. One year after inclusion in this study, patient mortality was recorded by the 11 practices. For the 1014 patients included, information on mortality (dead/alive at follow-up) could be obtained.

The database and statistical processing of the data were performed and analyzed in the statistical program SPSS 26 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used for the results collection, presentation and interpretation. The study population is presented descriptively. In addition, we determined the association of various personal, sociodemographic, lifestyle, medical, and laboratory characteristics (an HbA1C value ≥ 8%, a total cholesterol value of ≥ 257 mg/dl (≥ 8th percentile), and assessment of patient compliance with all-cause mortality and a χ^2 test was used to assess the significance of the associations.

Multivariable logistic regression was then used with a backward variable selection procedure to identify the independent association of several factors with all-cause mortality. Researchers then removed stepwise all variables that did not contribute to the model in a statistically significant manner ($p > 0.1$). Finally, odds ratios (ORs) and 95% confidence intervals were calculated for all variables included in the final model.

Results

In total, 1014 patients with known DM aged 40 years or older were included in this study. The response among all eligible patients with DM was 88%. In addition, 882 (87%) of the patients presented to the 11 participating general practices and 132 (13%) were seen in nursing homes or visited at home by physicians.

Fifty-five percent of the patients with DM were women. The mean age of patients with DM was 69.0 years (SD 10.4, range 40 to 91 years), two-thirds of them (66%) were between 60 and 80 years old and 65% were married. The time since diagnosis was less than 5 years in 34 % of patients, 5 to 10 years in 32 % and more than 10 years in 30 % of patients. Overall, 18 % of patients were rated as "very good," 45 % as "fairly good," 31 % as "fairly poor," and 6 % as "very poor"for their compliance.

During the 1-year follow-up period, 48 (4.7%) of the patients died. Table 1 shows all-cause mortality according to various factors. In the bivariate analysis, gender was not associated with all-cause mortality. However, time since diagnosis of DM and macrovascular or microvascular complications at baseline were associated with a higher proportion of subjects who died during follow-up.

Table 1. All-cause mortality according to various sociodemographic and medical factors.

	Dieddduringfollow-up		
	s/n	%	Valueof p
Total	48/1014	4.7	
Typeofpatient			
Patients presenting to the office.	24/882	2.7	
Home care or patients visited	24/132	18.2	< 0.0001
Genre			
Male	26/458	5.7	
Female	22/551	4.0	0.2
Yearsofage)			

40 - 59	1/214	4.7	
60 - 69	9/342	2.6	
70 - 79	16/324	4.9	
80 +	22/131	16.8	< 0.0001b*
Family status			
single	4/50	8.0	
married	22/626	3.5	
widower	22/246	8.9	
Divorced	0/34	0	0.004b _
Time since diagnosis of diabetes (years)			
< 1 year	0/71	0	
1 to 4 years	9/270	3.3	
5 to 10 years	17/328	5.2	
> 10 years	21/305	6.9	0.04b _
Macrovascularcomplications at baseline			
Yes	36/398	9.3	
No	12/625	1.9	< 0.0001
Microvascular complications at baseline			
Yes	23/296	7.8	
No	25/718	3.5	0.005

Source: statistical analysis, numbers do not always add up to the total due to missing information on some items, *Fisher's exact test, $p \leq 0.05$.

Patients whose compliance was considered at baseline as "very poor" showed a 1-year mortality of 13.1 % compared with a 1-year mortality of 4.2 % ("fairly poor"), 3.8 % ("fairly good") and 4.0 % ("very good") in the respective categories (p = 0.01). In contrast, a high HbA1C value (≥ 8 %) and a cholesterol value ≥ 257 mg/dl (≥ 8th percentile) at baseline did not show a statistically significant association with all-cause mortality during 1-year follow-up.

Unconditional logistic regression and a stepwise backward selection procedure were then used to find the most parsimonious model of factors associated with all-cause mortality. Patients cared for in nursing homes or visited at home had higher odds of dying during the follow-up than patients who presented for surgery (OR 3.92, 95 % CI 1.85-8.30). In addition, female patients showed significantly lower odds of dying than males (OR 0.34, 95 % CI 0.17-0.67). In addition, there was an apparent increase in the risk of dying with age. Furthermore, macrovascular complications were a statistically significant determinant of subsequent risk of dying (OR 3.17, 95% CI 1.57-6.39). Physician assessment of patient compliance was also an important factor associated with all-cause mortality. Patients whose compliance was assessed as "very poor" had an OR of 2.67 (95% 1.02-6.97) compared to patients assessed as "very good" or "fairly good."Finally, hbA1C values, total cholesterol, prescription of medication or lipid-lowering drugs, or blood pressure values from baseline were added to the model. None of the last four variables met the criteria for inclusion in the model.

Finally, a small survey was conducted among the fifteen physicians to determine which aspects of compliance were most important to them when making this assessment individually. For most of them, self-acceptance of the disease, treatment adherence, the patient's interest in the physician's explanations, attendance at appointments, good self-management, and an excellent physician-patient relationship were key elements. The patient's comorbidity, a high HbA1C value, good social support and health-related quality of life were other, sometimes less important, elements in their decision-making.

Discussion

In this study, physician assessment of patient compliance was found to have independent prognostic value for subsequent risk of death, which persisted after control for other factors. Compliance may reflect many aspects of successful diabetes self-management, and identifying patients who need better compliance may help guide preventive measures.

It is well accepted that optimal glucose control, adherence to a treatment regimen and successful self-management minimize the likelihood of diabetic complications and, subsequently, the risk of death[5,6]. However, many different components appear to be related to successful self-management of this chronic disease; Provider characteristics, the physician-patient relationship, and patient's characteristics and beliefs, as well as environmental, social, and cultural factors, contribute importantly to this complex problem[7]. In addition, although physician assessment of patient compliance appears to be strongly related to glycemic control, its prognostic value was found to be independent of glycemic control in this study and prognostically more relevant than glycemic control[8,9].

The key element in chronic disease management is self-management. Unfortunately, many patients are unwilling or unable to take full responsibility for their care[10,11]. Successful treatment must be viewed as a team approach, incorporating patients, caregivers and family members, and the individual's social context[12]. Factors such as good team spirit in medical practice can improve the management of chronically ill patients[13,14]. However, attempts to increase the frequency of appointments or use other measures in patients with poor compliance may be counterproductive. Many of these patients will react with even more resistance. A promising approach may be strengthening the "sense of coherence" by considering aspects of comprehensibility, manageability and meaningfulness from the patients' social and personal perspectives [15,16]. Previous work suggests that individual differences in perceived control and coping strategies may interact strongly with chronic disease management[17,18]. However, more studies are needed, especially in the primary care setting, to determine which factors pose barriers to an integrative conception of successful chronic disease management and what adherence means from the physician and patient perspective. As demonstrated by the cross-national Diabetes Attitudes, Wishes and Needs (DAWN) study, psychosocial problems in patients with diabetes are common, according to the patient and provider reports, and are perceived as significant barriers to effective self-care. Patient adherence to the regimen was suboptimal in all ten participating countries, and providers believed that the cause was primarily psychological problems. However, providers also reported that they often lacked the critical resources to address these problems[19,20].

Looking at the results of this study, the following strengths and weaknesses should be considered: relatively few patients were assessed as having "very poor" compliance and only for this group was the prognostic relevance evident. Unfortunately, no comparison was made with other related samples or normative groups. In addition, no measure was made of a specific component of compliance, such as adherence to treatment (e.g., pill count) or adherence to a special diet. However, the study measured physicians' assessment of patient compliance as an integrative measure (including also aspects of self-care behavior) and the small qualitative survey among physicians allowed obtaining important clues as to which aspects of compliance were most important to them when doing this on an individual basis. Notably, HbA1C, social network, and health-related quality of life were less important in their decision making regarding assessing patient compliance.

Conclusions

This study suggests that assessing patient compliance by the primary care physician is a valuable prognostic marker for the risk of subsequent death among patients with type 2 diabetes. In addition, identifying patients needing efforts to improve compliance may help guide preventive measures.

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