Factors Associated with the Lack of Adherence to Drug Therapy in Diabetic Patients

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ABSTRACT

According to the World Health Organization, there are more than 347 million people living with diabetes, being one of the leading causes of death in our days. Diabetes mellitus is a chronic metabolic disorder characterized by an increase in glycemia values above normal, which is accompanied by late complications derived from progressive damage in kidney, retina, vessels, heart, and nervous system. The best way to avoid these complications is adherence to treatment. However, the lack of treatment continuity is very frequent. This paper demonstrated that in 76% of the cases, patients with diabetes do not accomplish the prescribed treatment. The main causes of this situation are related to the patient's habits (since diabetes has no symptoms, the patients skip doses) and to the health system (due to the lack of free drug provision, patients do not have access to the treatment). From this data, health country authorities initiated a program to aware patients of the importance to accomplish the treatment and provided free drug for those patients.

Key words: Adherence, diabetes, treatment

INTRODUCTION

According to the World Health Organization, there are more than 347 million people living with diabetes, being this illness one of the leading causes of death in our days. In patients with diabetes, the risk of death is at least twice as high as in people without this disease.[1]

Diabetes mellitus is a chronic metabolic disorder characterized by an increase in glycemia values above normal, which is accompanied by late complications derived from progressive damage in kidney, retina, vessels, heart, and nervous system.[2]

It is a prevalent disease with a high cost for health services, usually associated with considerable morbidity and mortality, therefore, became a serious public health problem.[3]

Approximately 15% of the Paraguayan adult population suffers from type 2 diabetes mellitus (DMT2).[4,5]

The treatment of DMT2 is based on diet, physical exercise, self-control of sugar levels, health education, and medication treatment based on oral antidiabetic drugs or insulin.

In developing countries, the average adherence to long-term treatment reaches only 50%, being even lower in developing countries. On average, only one in three patients all over the world correctly follows the indications of their doctors, with different adhesions rate.[6]

Treatment adherence is then a strategy that allows patients to maintain and continue the treatment and in this way achieves significant changes in their behavior that improves their lives.[7]

The causes of lack of adherence are numerous and knowing them is essential to understand this health problem.[8]

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The pharmacist is health professional who has the knowledge to collaborate in the correct use of medicines prescribed by medical doctors and to optimize patient's adherence.[9] Pharmacist has the closeness, accessibility, and confidence of both patient and other health's professionals.[10-12]

Based on the pharmacist interventions, this paper proposes to identify factors that may either contribute or avoid adherence of treatment in diabetes disease.

MATERIALS AND METHODS

This is an observational, analytical, and prospective study. The data collection tools were a questionnaire (Morisky-Green test) adapted for this study to determine the adherence to pharmacological treatment and laboratory database of the blood parameters such as glycemia and glycosylated hemoglobin (HbA1c) values.

The data requested were the type of medication, the frequency, and indication of drug consumption and whether the patient was considered a compliant pharmacotherapy. In addition, patients were asked to cite the reasons why they did not comply with the pharmacotherapy.

The units of analysis were patients that attended to health center from the National Diabetes Program (PND) who were aleatory included in the study. Patients were adults >than 18 years, receiving pharmacological treatment for DMT2 for >6 months, with the ability to read, understand, and sign informed consent.

The period of study was the months of September–October of the year 2014 with the follow-up until October 2018.

The Ethics Committee of the Faculty of Chemical Sciences of the National University of Asunción evaluated the proposal of the present work and considered that no ethical incompatibilities were detected CEI-129/14.

Statistical Analysis
The data were analyzed using the statistical program, SPSS v.17. For the analysis, the Kolmogórov–Smirnov test was used to know the normality of the variables studied.

Quantitative variables were presented as mean values, standard deviation, and minimum and maximum 95% confidence interval, while those without normal distribution were presented in median. The qualitative variables were presented in percentages for each parameter explored. To compare means values of parametric variables, the Student's *t*-test was used; Mann–Whitney U-test was performed for non-parametric variables, and the Chi-square test was used to determine the association between variables. $P < 0.05$ was considered statistically significant. The Excel 2007 program was used to prepare the tables and graphs.

RESULTS

The sociodemographic characteristics of the participants in the study are shown in Table 1. Seventy-four patients were included in the study and completed the follow-up protocol. From them, 53% were female, 71% of patients speak Spanish and Guaraní (native South American Indian language), 61% were married or in couple, and 46% had complete primary education.

The average age was 57 ± 6.4 years old. The average time of evolution of the disease was 10 ± 2.3 years. When comparing the values of the clinical parameters of glycemia and HbA1c, it was observed that HbA1c levels in patients averaged were 8.1% [Table 2]. Only 14 patients hada normal value of HbA1c ($\leq6, 5\%$), at the beginning of the study.[4]

According to the results obtained from the 74 patients, 18 (24%) were adherent to pharmacotherapy, complying with the doses and frequency indicated by the doctors of the National Diabetes Program, while 56 (75.7%) were not comply or did not remember the indications given by the prescribers. Table 3 shows the clinical parameters: Glycemia and HbA1c of the patients.

The mean values of the clinical parameters of HbA1c and glycemia were lower in the adherent patients, in comparison to the non-adherent patients; the difference between these values was not statistically significant ($P = 0.05$).

In Table 4, the motives referred by the patients of lack of compliance are shown in frequencies, so the major cause not comply with the prescribed pharmacological therapy was because they forgot one or more doses (70% of the cases),

Table 1: Sociodemographic characteristics of patients (*n*=74)	
Sociodemographic characteristics	***n*=74 (%)**
Gender	
Female	39 (53)
Male	35 (47)
Age (years old)	
20–39	2 (2)
40–59	33 (45)
≥60	39 (53)
Marital status	
With couple	45 (61)
Without couple	29 (39)
Education	
Primary (elementary)	34 (46)
High school	28 (38)
University	12 (16)

Table 2: Quantitative sociodemographic and clinical data (*n*=74)						
Quantitative data	Mean value	DE	IC 95%		Mínimum	Máximum
			LI	LS		
Age (years)	57	6	25	84	4	99
Age of diagnosis (years)	44	17	41	47	1	99
Disease evolution time (years)	10	2	9	13	0	99
Glycemia	172	70	138	163	61	530
Glycosylated hemoglobin	8.1	1.9	7.1	8.1	4.0	15.0

CI 95%: Confidence limital 95%, LI: Lower limit, LS: Upper limit

Table 3: Glycemic control in adherent and non-adherent patients			
Variables	Adherence (*n*=18) (%)	No adherence (*n*=56) (%)	*P*
HbA1c (%)	7.9	8.1	0.615
Good (6.5)	5 (28)	9 (16)	
Acceptable (6.6–7.5)	3 (17)	16 (29)	
Bad (7.6)	10 (56)	31 (55)	
Glycemia (mg/dL)	149.7 (mg/dL)	179.3 (mg/dL)	0.251
Good (130)	9 (50)	20 (36)	
Acceptable (13–170)	5 (28)	11 (20)	
Bad (171)	4 (22)	25 (45)	

the unavailability of medicines in the program (21%), and the adverse reactions related to treatment (11%).

DISCUSSION

The progressive aging of the population, unhealthy lifestyles are accompanied by a high prevalence of chronic diseases, which lead to an increase in the need to use drugs, in continuous and complex pharmacological protocols of treatments, with the aim of controlling the diseases or to improve their symptoms.[13-15]

The time of evolution of the DMT2, in the total of the patients was 10 ± 2.3 years, existing patients with 9 years of diagnosis and others with 13 years, which demonstrated that patients included in the study were risky ones since it is well known that there is a direct relationship between the time of diagnosis of diabetes and the appearance of chronic complications such as diabetic retinopathy.[16]

Adherence rates for life changes linked to chronic diseases are around 50%. However, patients with DMT2 are especially prone to presenting adherence problems.[17]

Many patients have difficulty controlling their glucose levels, as well as controlling their associated risk habits: Sedentary lifestyle and inadequate diet. These features are associated with severe consequences on patients' health. Hence, adherence to treatment appears as a main goal to be achieved in the management of diabetes.[17]

In Paraguay, adherence rates are known to be between 56 and 63%.[18] Noteworthy, our data clearly demonstrated that these rates are lower, aspect that can collaborate in rethinking the data obtained from studies carried out in the past.[6,18]

In the National Diabetes Program, patients receive their diabetes medications free of charge. However, there are usually periods of time where medications are missing periods, in which the patient must acquire their medicine, which can influence in their adherence.

As we see in the previous research, the lack of adherence is a recurrent fact and a global problem. It is precisely the low adherence to therapies in chronic diseases, which causes morbidity and mortality that could be avoided.

Diabetes is surely the chronic disease that most needs the education of the patient and an educational intervention of the pharmacist. Both strategies are known to improve the clinical situation of the diabetic patient,[19-22] their satisfaction with the treatment, and their quality of life.[23,24]

According to studies, the degree of knowledge of the disease and medication by patients favors compliance,[19,25-29] as well as influencing their quality of life and degree of satisfaction.[30]

It is also demonstrated that a patient active participation on his pharmacological treatment optimizes the therapeutic fulfillment.[25,31]

Hence, to favor adherence, it is important that the patient takes as few medications as possible, with same pharmaceutical formulations and with the greatest possible therapeutic interval. Some of the strategies is to use sustained-release drugs or pharmaceutical forms with several associated active ingredients.[32]

Table 4: Reasons for non-adherence to the use of medications (*n*=74)

Reasons for non-compliance	*n*=56 (%)
"I forgot"	39 (70)
Lack of medicines in the PND	12 (21)
Adverse reactions	6 (11)
Insulin transport discomfort	4 (7)
Decrease the dose of medication	4 (7)
Because it feels good without treatment	3 (5)
Discomfort of the route of administration	3 (5)
Prioritize daily activities to medication	3 (5)
Disinterest in the antidiabetic drug treatment	3 (5)
Use of therapeutic alternatives (local roots or leaves)	1 (2)

Once again, the lack of adherence entails severe health consequences such as recurrence of diseases, increase in hospital admissions and visits to the emergency department, risk of transmission of contagious diseases, and increase of both individual and social costs.

Allowing patients to participate in decisions based on information in a shared medical decision model are strategies that are being tried in other latitudes, in which an important component of the decision is respect for the values, and preferences of patients[33] have not yet been demonstrated in scientific research.

Some authors demonstrated in a diabetic study that using decision cards and reminders improved adherence in 3 months;[34] however, the same study performed by Mann in the Latino population was not satisfactory.[35,36]

In resume, many factors may lead to an increase of treatment adherence in diabetes disease. However, for our study, the main problems were that patients just forget one or more doses (39/56), or the program that provides medicines, runaway of them (12/56).

To help patients to increase their treatment compliance, our group initiates actions to guarantee diabetic type 2 drug provision to increase patients access their treatment by the social security (PND in the case of Paraguay) and created a program to raise awareness among those patients about the importance of not to skip a shot of their medication.

CONCLUSIONS

The results obtained in this paper demonstrated that 76% of diabetic patients have no continuity in their treatment. The main causes of the poor adherence to pharmacological treatment were explained by patient's habits, frequent dose forgetfulness, and lack of access to medication. In every health system, it is important that authorities realize about the importance of health promotion program to increase patients awareness of compliance of the treatments, to guarantee the antidiabetic drug provision, and to avoid not only the severe health consequence of this disease but also the economic burden for health's systems.

Recommendations

The role of the pharmacist in the health team may help to prevent treatment drop off and to ameliorate patient's adherence. Programs conducted by health authorities in each county to increase patient's access to their prescribed medicine might contribute to encourage them to pursue their pharmacological therapy and, therefore, avoid the complications associated to chronic disease like diabetes.

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