

Adherence to drug treatments in patients with chronic kidney disease on hemodialysis

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Abstract

Chronic Kidney Disease is associated with the use of polypharmacy and is associated with increased risk of adverse events, drug interactions and decreased adherence to drug treatment. The aim of the present study was to evaluate treatment adherence in patients with chronic kidney disease undergoing hemodialysis. We conducted a cross-sectional, descriptive and analytical survey of all patients enrolled and followed in the Nephrology services of the Ijuí Charity Hospital and the Kidney Clinic, attached to the Santo Ângelo Hospital, from January to June 2017. Data collection was performed through an individual interview, using a structured and validated questionnaire. Depression was assessed by applying the Beck Depression Inventory and adherence was by the Morisky Adherence Scale. 184 patients were interviewed, and among those interviewed, 66.2% had low adherence. Infarction, repetitive infections and depression were factors statistically significantly associated with poor adherence, as well as the use of more than six medications. Performing physical activities was associated with a greater adherence to medication use. 45.7% of patients responded that they had at some point forgotten to take their medication, and 42.4% stopped taking their medication when they felt their symptoms were under control. Therefore, health education actions, as well as pharmacotherapeutic follow-up of these patients, should be performed with a focus on improving adherence and quality of life, with a view to increasing survival.

Keywords: Chronic Kidney Failure, Medication Adherence, Hemodialysis, Drug Use, Hemodialysis Hospital Units.

INTRODUCTION

Chronic Kidney Disease (CKD) is considered a public health problem¹, with worldwide prevalence of 12-14%². CKD treatment should be multidisciplinary, due to the systemic character of the disease, and it is important to associate dietary treatment, water restriction and drug treatment³. Specifically, regarding medication use, CKD treatment has a high frequency of polypharmacy⁴.

Authors have highlighted factors that influence adherence to therapy, among which stand out: trust in the team, support networks, education level, acceptance of the disease, side effects of the therapy, lack of

access to medicines, long treatment, complex treatment regimen, absence of symptoms, difficulty in transportation, lack of knowledge about the disease, treatment limitations, disorders experienced in hemodialysis sessions, control of rates by laboratory tests, faith, hemodialysis machine and social support^{5,6}. Thus, it is considered that the factors that interfere with adherence are complex, making multidisciplinary action necessary for the understanding of this phenomenon and the development of educational strategies to raise awareness of the importance of adherence to treatment and to make possible improvements

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to quality of life⁶.

Non-adherence to drug treatment may cause risks related to the effects of the disease itself, affecting the evolution of treatment as well as the patient's quality of life, which result in personal, social and economic losses⁷. Adherence to CKD treatment can improve the hemodialysis session, reducing the risk of complications, and maintain their physical, social and psychological well-being⁵.

Chronic diseases require constant treatment, and adherence to prescribed pharmacotherapy is essential to maintain a good quality of life for kidney patients. Thus, the present study aims to evaluate the adherence to treatment of patients with CKD undergoing hemodialysis, using an indirect assessment method considering all drugs prescribed for home use.

MATERIALS AND METHODS

A cross-sectional, descriptive and analytical survey was conducted of all patients enrolled and followed by the Nephrology unit of the Ijuí Charity Hospital and the Kidney Clinic, attached to the Santo Ângelo Hospital.

Data collection was performed from January to June 2017, 184 patients were interviewed in both services. 110 patients were from the Kidney Clinic of Santo Ângelo Hospital and 74 patients were from the Nephrological Unit of Ijuí. The study included all patients over 18 years old with a diagnosis of CKD undergoing hemodialysis.

Data collection was performed through an individual interview, using a sociodemographic and clinical questionnaire with the following variables: age, gender, marital status, educational level, comorbidities, physical exercise, medication use and treatment adherence. Regarding medications, all continuous use medications prescribed to the patient at the time of the interview were considered.

Depression was assessed using the Beck Depression Inventory, which allows the assessment of the intensity of depressive symptoms. The instrument has 21 items, with four affirmative answers. The score ranges from 0 to 3, except for items 16 and 18 which have

seven statements and the score does not vary. The patient chooses the alternative that most identifies how they are feeling in the last two weeks. The items are according to the levels of depression in ascending order, the total score is the result of the sum of the individual items, reaching a maximum of 63 points. The final score classifies the levels as minimum, mild, moderate and severe⁸.

Medication adherence was assessed using the Morisky Adherence Scale⁹ (MMAS-8), which presents eight closed questions with yes or no answers, where the adherence rate was assessed as follows: high adherence (8 points); average adherence (6 to <8 points); poor adherence (<6 points). Those with a score of 8 were considered adherent. For the purposes of this study, the results were categorized as high and medium (up to 6 points) and low (<6 points).

Data were analyzed using a simple descriptive analysis with mean, frequency, standard deviation, and the analysis of data normality was tested using the Kolmogorov-Smirnov test. To verify the association between two or more qualitative variables, the Pearson Chi-square hypothesis test was used. For all tests, a significance level of 5% was considered. The software used for data analysis was the Statistical Package for the Social Sciences (SPSS) version 18.0.

This study was approved by the Research Ethics Committee of the University of Cruz Alta (UNICRUZ), under protocol No. 1.871.846.

RESULTS

In the present study, 184 patients undergoing hemodialysis were evaluated. Among the interviewees, 66.2% had low adherence and 33.8% high. Among those who were over 60 years old, 29.3% had low medication adherence (Table 1). Among men there was a higher frequency of low drug adherence although without statistically significant difference ($p=0.109$). Among patients with low education, 92 (50%) had low adherence to treatment ($p=0.810$) (Table 1).



Table 1 – Sociodemographic characteristics of patients undergoing hemodialysis and the correlation with adherence. Santo Angelo, Ijuí, State of Rio Grande do Sul, Brazil - 2017. (N = 184)

	Low Adhesion n (%)	High Adhesion n (%)	p
Age			
Up to 59 years	47 (25.5)	32 (17.3)	0.450
More than 60	54 (29.3)	43 (23.3)	
Marital status			
Married	55 (29.8)	51 (27.7)	0.914
Not married	67 (36.4)	25 (13.5)	
Sex			
Male	69 (37.5)	43 (23.3)	0.109
Feminine	32 (17.3)	33 (17.9)	
Education			
Low	92 (50)	70 (38.04)	0.810
High	6 (3.2)	9 (4.8)	
Have children			
Yes	86 (46.7)	70 (38.04)	0.157
Not	15 (8.1)	6 (3.2)	

Regarding the main comorbidities that affect these patients, the infarctions reported by 19 patients was highlighted. Of these, 15 patients demonstrated a statistically significant low adherence to treatment ($p=0.041$) (Table 2). Repetitive infections were more frequent among patients with poor adherence ($p=0.005$). Regarding hypertension, 131 patients were hypertensive, but there was no association of this disease with adherence, as well as diabetes (Table 2). Severe depression was observed in 3 patients, all three had poor adherence to their treatment.

Medication adherence was assessed using the Morisky Adhesion Scale (MMMS-8), and 45.7% of patients answered that they had, at some point, forgotten to take their medication. 42.4% stopped taking their medication when they felt that their symptoms are under control (table 3). In addition, 57.6% reported never forgetting to take their medication.

Table 2 – Comorbidities and symptoms and the relationship with treatment adherence of patients undergoing hemodialysis. Santo Angelo, Ijuí, State of Rio Grande do Sul, Brazil - 2017. (n = 184)

	Low Adhesion n (%)	High Adhesion n (%)	p
Infarction			
Yes	15 (8.1)	4 (2.2)	0.041 *
Not	86 (46.7)	72 (39.1)	
Hypertension			
Yes	72 (39.1)	59 (32)	0.341
Not	29 (15.7)	17 (9.2)	
Diabetes			
Yes	48 (26)	39 (21.1)	0.618
Not	53 (28.8)	37 (20.1)	
Repetitive Infections			
Yes	22 (11.9)	5 (2.7)	0.005 *
Not	79 (42.9)	71 (38.5)	
Depression			
Not	36 (19.5)	33 (17.9)	0.036 *
Serious	3 (1.6)	0 (0)	
Anemia			
Yes	76 (41.3)	47 (25.5)	0.133
Not	25 (13.5)	29 (15.7)	
Hypotension			
Yes	25 (13.5)	11 (5.9)	0.093
Not	76 (41.3)	65 (35.3)	
Pain			
Yes	46 (25)	29 (15.7)	0.338
Not	55 (29.8)	46 (25)	
Weight loss			
Yes	50 (27.1)	29 (15.7)	0.133
Not	51 (27.7)	47 (25.5)	
Cramps			
Yes	56 (30.4)	39 (21.19)	0.585
Not	45 (24.4)	37 (20.1)	
Constipation			
Yes	14 (7.6)	4 (2.1)	0.061
Not	87 (47.2)	72 (39.13)	

Note: for depression, the mild and moderate degree was not considered. Source: author's own database



Table 3 – Morisky Adhesion Scale of patients undergoing hemodialysis in Santo Ângelo, Ijuí, Rio Grande do Sul, Brazil - 2017. (N = 184)

Morisky Adhesion Scale - Questions	Yes (%)	No (%)
Have you ever forgotten to take your medicine?	45.7	50.5
Has there ever been a day in the last two weeks that you haven't taken your medicine other than due to forgetting?	17.9	78.3
Have you stopped taking your medicine without telling your doctor because you felt something you didn't feel before?	15.2	81.0
When you travel or leave home, do you ever forget to take your medicine?	18.5	77.7
Did you take all your medicines yesterday?	88	7.1
When you feel your symptoms are under control, do you sometimes stop taking your medicines?	42.4	53.8
Have you ever been bothered by having to adhere to your treatment?	34.2	61.4
Do you often have difficulty remembering to take all your medicines?	57.6	19.6

Note: the last question did not consider those who answered: sometimes, usually and always. "Yes" were those who answered never/rarely and "No" were those who answered from time to time.

It was observed that patients who used six or more drugs had a lower adherence more frequently ($p=0.008$). There was also an association between physical activity and high adherence to treatment ($p=0.036$); however, there was no relationship between performing leisurely activities and adherence (Table 4).

Table 4 – Medication use, leisurely activities and physical activity in patients undergoing hemodialysis. Santo Angelo, Ijuí, State of Rio Grande do Sul, Brazil - 2017. (N = 184)

	Low Adhesion n (%)	High Adhesion n (%)	p
Use of Medication			
Up to 5 medications	45 (24.4)	40 (21.7)	0.008*
6 or more medications	48 (25.9)	30 (16.3)	
Leisure activities			
Yes	71 (38.5)	52 (28.2)	0.952
No	29 (15.7)	23 (12.5)	
Physical activity			
Yes	43 (23.3)	38 (20.6)	0.036*
No	58 (31.5)	38 (20.6)	

DISCUSSION

Regarding the sociodemographic characteristics of the patients, it was observed that there the patients were predominantly male. The same was observed in a study from Caxias do Sul that evaluated drug adherence in chronic kidney patients, with 67.5% of the patients were male¹⁰. Regarding age, patients older than 60 years were the majority, but no difference was observed regarding adherence in this study. However, age is a factor related to the lack of adherence, specifically concerning knowledge related to the disease, health literacy and cognitive function. Other factors are drug-related factors such as adverse effects and polypharmacy, and factors including patient-provider relationship and various logistical barriers to obtaining medication¹¹.

Regarding patients' educational level and adherence, there was no association in the present study. Another study, however, with hypertensive patients, also found no significant difference between such variables¹². A specific study with dialysis patients showed that such



an association was not verified in the searched databases. It has been found that learning about pharmacotherapy may be impaired by a poor education, especially in pharmacological treatments with increased complexity⁵.

Among the comorbidities that affect kidney patients, the present study highlights hypertension and anemia, as reported by another study¹⁰. Hypertension is considered one of the leading causes for the development of CKD, but it is also a consequence of this kidney injury. Regarding adherence to drug treatment, there was no statistical significance regarding the patient being hypertensive. In another study, the individuals presented low adherence rates due to the following factors: psychosocial origin or stress and the difficulty in lifestyle changes¹³.

In the present study, the prevalence of anemia was lower than another study with 76 patients who showed an 80% prevalence of anemia¹⁴. Another study conducted in the Hemodialysis sector of a Hospital in the Northwest region of Rio Grande do Sul State (RS), observed that the use of medication for anemia is frequent and associated with drug interactions¹⁵. In CKD anemia is one of the main complications, in which there are several causes contributing to it, and the relative deficiency of erythropoietin is one of the main causes.

Infarction was more frequent among respondents with poor adherence to treatment. Repetitive infections were associated with poor adherence. No other studies were found with this public showing such associations. Repetitive infections are common in these patients due to access points, especially catheters, which account for 50 to 80% of these infections; moreover, kidney patients are immunosuppressed and susceptible to infections¹⁶. It can also be inferred that patients who have poor adherence may be more susceptible to abandoning antibiotic treatments and consequently have repetitive infections. The high prevalence of coronary heart disease and heart failure in patients with CKD is due to the presence of common risk factors and the intensification of the atherosclerosis process in uraemia¹⁷.

It was found that 3 patients had severe depression and poor adherence. Depression

in these patients is frequent due to the impact of the disease on quality of life. It influences poor adherence due to the pessimistic thoughts concerning the disease as well as the perception of the importance of treatment¹⁸.

Symptoms presented as anemia, hypotension, pain, weight loss, cramps and constipation were not related to therapy adherence, but are common symptoms presented by the patient during and after the dialysis session which may also be due to adverse effects of medication use⁵.

The use of various medications in kidney patients is explained by the complexity of the disease and is essential for a better quality of life, for treating comorbidities, for slowing progression and for controlling associated complications¹⁹. Kidney patients need drug treatments for each of their comorbidities, impacting the potential increase in the number of drugs¹⁰. Polypharmacy is common in chronic diseases and is directly related to poor treatment adherence²⁰. The average number of drugs used by the evaluated patients (six) was related to low adherence, which corroborates another study with hemodialysis patients¹⁰. The large number of medications can influence the non-adherence or their forgetting to take some medication.

Performing physical activities was statistically significant in relation to high adherence to treatment, this association was also observed in a study with elderly patients in Espírito Santo²⁴. In chronic kidney disease patients undergoing dialysis treatment, the practice of physical exercises is of paramount importance. The disease can result in reduced functionality and conditioning, both of which can be improved with physical exercise²².

Adherence to pharmacotherapy is complex and critical to the success of the therapy's clinical efficacy. Patients with low adherence are susceptible to complications of the present diseases due to their failure to take medication, which can lead to unnecessary hospitalizations, as well as increasing costs for the public health system²³. In the present study, adherence was assessed using the Morisky Adhesion Scale (MMS-8); as well as in other studies^{10,24} with hypertensive and kidney patients, respectively. In the studies cited, most patients had a low



adherence to pharmacological treatment, just as in the present study.

Regarding forgetting to take their medicine at some point, approximately half of the patients said they had forgotten to take it, this finding is in line with another study conducted with this public²⁵. The fact that forgetfulness can cause unwanted effects due to underdosing, as well as an exacerbation of symptoms, leads to the worsening of the patient's clinical condition and may result in therapy's failure.

When patients were asked if they stopped taking their medication when their symptoms were controlled, there was a predominance of those who stopped taking them. A study conducted in Porto Alegre evaluated the main factors influencing non-adherence in patients on hemodialysis therapy, and one of the most frequent was the absence of symptoms. This fact may be explained by fact that when the nephropathic patient is diagnosed and before starting pharmacological treatment, they find themselves greatly weakened. However, as this clinical condition improves with the use of hemolytic and drug therapies, the patient may discontinue treatment⁵.

Most patients reported that drug treatment is important to their health and that they need

the medication to live better and longer. It is also believed that health education is one of the factors that influence greater adherence, be it with the patient or the caregiver. In this context, the pharmacist can help these patients by advising them concerning the importance of adhering to therapy, not abandoning treatment and how to adapt and live with the disease; thus, they contribute to the health promotion of these patients. The major concern arising from the results of this study is with patients who have poor adherence, because this results in therapeutic failure, affects the quality of life and survival of chronic kidney patients, leading to a higher risk of complications and treatment failure.

The importance of accompanying and monitoring these patients is emphasized. Interdisciplinary teamwork is necessary for this purpose. Among the members of the team, the presence of the pharmacist, who can provide guidance in favor of an appropriate therapeutic management, is emphasized. Therapeutic follow-up, in this context, emerges as a tool for following the progress of these patients in which the pharmacist can assist the team to improve treatment adherence; which allows for a better quality of life for the patients¹⁵.

CONCLUSION

The present study showed that low adherence was associated with infarction, repetitive infections, depression and the use of more than six continuous medications. Knowing such factors is important to focus strategies on patients more prone to low adherence, and these strategies may be multidisciplinary, as well as focused on pharmaceutical monitoring.

Adherence to pharmacological treatment for kidney patients is extremely important, as well as health education strategies that favor adherence and help patients improve their survival. The pharmacist is an important part in this process. Also, the pharmacist can follow-up and monitor actions on medication use of patients on hemodialysis, focusing on the most susceptible groups.

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