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RESEARCH

Association between follow-up in health services and antihypertensive medication adherence

Associação entre acompanhamento em serviços de saúde e adesão terapêutica anti-hipertensiva

Asociación entre seguimiento en servicios de salud y adhesión terapéutica antihipertensiva

Nila Larisse Silva de Albuquerque[I], Andressa Suelly Saturnino de Oliveira[I], Jacqueline Mota da Silva[I], Thelma Leite de Araújo[I]

[I] *Universidade Federal do Ceará. Fortaleza, Ceará, Brazil.*

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ABSTRACT

Objective: To analyze the association between the characteristics of follow-up in health services and adherence to antihypertensive medication in patients with cardiovascular disease. **Method:** Analytical study carried out with 270 patients suffering from hypertension and hospitalized due to cardiovascular complications. Data collection occurred between November 2015 and April 2016, involving sociodemographic variables, presence of self-reported diabetes, accessibility and use of health services, blood pressure levels and medication adherence (analyzed through the Morisky–Green Test). **Results:** The rate of adherence to antihypertensive therapy was 63.0%. Enrollment in the Hiperdia program had no statistical significance to medication adherence. People who attended at least between 4 and 6 nursing consultations throughout the data collection period (p = 0.02) had better adherence. **Conclusion:** The study's findings provide support for the reorientation of health services and their public policies towards improving adherence to antihypertensive therapeutics.

Descriptors: Hypertension; Medication Adherence; Health services; Health Services Accessibility; Nursing.

RESUMO

Objetivo: Analisar a associação entre as características do acompanhamento em serviços de saúde e a adesão ao tratamento anti-hipertensivo em pacientes com doença cardiovascular. **Método:** Estudo analítico, realizado com 270 pacientes com hipertensão internados pela ocorrência de complicação cardiovascular. A coleta de dados ocorreu entre novembro de 2015 e abril de 2016. Analisaram-se variáveis sociodemográficas, presença de diabetes autorreferida, condições de acesso e utilização de serviços de saúde, níveis de pressão arterial e adesão terapêutica por meio do Teste de Morisky-Green (TMG). **Resultados:** A taxa de adesão terapêutica anti-hipertensiva identificada foi de 63,0%. O cadastro no programa Hiperdia não apresentou significância estatística com a adesão. Esta medida foi melhor naqueles que compareceram entre 4 e 6 consultas de enfermagem no ano (p = 0,02). **Conclusão:** Os achados fornecem subsídios para a reorientação dos serviços de saúde e suas políticas públicas para a ampliação da adesão terapêutica anti-hipertensiva.

Descritores: Hipertensão; Adesão à Medicação; Serviços de Saúde; Acesso aos Serviços de Saúde; Enfermagem.

RESUMEN

Objetivo: Analizar la asociación entre las características del seguimiento en servicios de salud y la adhesión al tratamiento antihipertensivo en pacientes con enfermedad cardiovascular. **Método:** Estudio analítico, realizado con 270 pacientes con hipertensión internados por la ocurrencia de complicación cardiovascular. La recolección de datos ocurrió entre noviembre de 2015 y abril de 2016. Se analizaron variables sociodemográficas, presencia de diabetes autorreferida, condiciones de acceso y utilización de servicios de salud, niveles de presión arterial y adhesión terapéutica a través de la prueba de Morisky-Green. **Resultados:** La tasa de adhesión terapéutica antihipertensiva identificada fue del 63,0%. El registro en el programa Hiperdia no presentó significancia estadística con la adhesión. Esta medida fue mejor en aquellos que asistieron entre 4 y 6 consultas

de enfermería en el año (p = 0,02). **Conclusión:** Los hallazgos proporcionan subsidios para la reorientación de los servicios de salud y sus políticas públicas para la ampliación de la adhesión terapéutica antihipertensiva.
Descriptores: Hipertensión; Cumplimiento de la Medicación; Servicios de Salud; Accesibilidad a los Servicios de Salud; Enfermería.

CORRESPONDING AUTHOR **Nila Larisse Silva de Albuquerque** E-mail: larisseufc@hotmail.com

INTRODUCTION

Hypertension (HT) is a chronic disease with an important influence on the occurrence of complications such as heart failure, coronary disease and cerebrovascular accident[1] when blood pressure levels are not kept under control[2]. In Brazil, it is estimated that 30% of the adult population, 50% of the elderly and 5% of the children and adolescents[3-4] suffer from HT. Research developed in 190 countries pointed to Brazil as the country with the sixth highest rate of hypertensive people in the world, with 552 out of every 100,000 inhabitants suffering from the condition. There was a significant increase of 13.2% in the prevalence of the disease between 2001 and 2011[5].

In contrast to advances in HT diagnosis and treatment strategies, it is estimated that 60% of patients with hypertension have above-target arterial pressure values, which puts them at risk of cardiovascular complications and lesions to target organs[6]. Lack of arterial hypertension control is often a reflection of inadequate adherence to antihypertensive medication[7].

The term "adherence" is defined by the World Health Organization[8] as the extent to which an individual's behavior—by correctly taking medication, following dietary guidelines and/or having healthy lifestyle habits—is in accordance with the recommendations of health professionals. The level of adherence to antihypertensive treatment is between 50 and 60% in the general population, with percentages of less than 50% in the elderly[7,9–10]. Low adherence increases the mortality of hypertensive patients, and leads to treatment resources being underutilized[11–12].

Adherence to antihypertensive treatment is a multidimensional phenomenon. It may be related to factors such as: user behavior; characteristics of disease/treatment; health services, and user environment[13–14]. Studies analyzing adherence factors have been more frequently focused on disease-related and treatment-related characteristics. This indicates researchers' and health professionals' difficulties in seeking answers to adherence problems outside these elements, by discussing factors such as the accessibility and use of health services.

OBJECTIVE

To analyze the association between characteristics of follow-up in health services and adherence to antihypertensive treatment in patients with cardiovascular disease.

METHOD

Ethical aspects

Those who agreed to participate signed a consent form. The study was approved by the Research Ethics Committee of the University of International Integration of Afro-Brazilian Lusophony (Unilab).

Design, location of the study and study period

This was an analytical study, carried out in a government-sponsored reference hospital for the diagnosis and treatment of cardiovascular diseases, located in the Northeastern region of Brazil. Data collection occurred between November 2015 and April 2016.

Population, inclusion and exclusion criteria

The inclusion criteria were: participants needed to have a diagnosis of arterial hypertension in their medical record, to acknowledge they were undergoing antihypertensive medication before hospitalization, and to be hospitalized due to occurrence of one of the following cardiovascular complications: acute myocardial infarction, coronary artery disease, stable or unstable angina. Exclusion criteria were: to present hemodynamic instability at the time of sampling, and to lack autopsychic or allopsychic orientation.

For the sample calculation, a population of 600 patients was considered, since, on average, there were 100 hospitalizations per month in the studied hospital units and a period of six months was established for data collection. Adherence to drug therapy in the considered hypertensive patients was 50%, with a 5% error and a 95% confidence interval. Thus, the sample had 253 people. During the data collection period the minimum sample was surpassed, reaching 270 participants. The access to the participants was performed through convenience sampling, in a non-intentional way.

Study protocol

Data collection was performed by nurses through a survey involving: sociodemographic data, presence of self-reported diabetes, information on accessibility and use of health services, and the Morisky-Green Test (MGT)[15]. To complete the collection process, the participant's blood pressure was verified according to the technique established by consensus in Brazil's health services[16]. MGT is composed of four questions with dichotomous, yes or no answers: 1) Do you ever forget to take your medication? 2) Do you sometimes not pay attention to taking your medication? 3) When you feel better, do you sometimes stop taking your medication? 4) When you feel worse after taking your medication, do you stop taking it?[17]. The test was validated with hypertensive patients, using blood pressure as a gold-standard[18–19]. In Brazil, MGT is the most used test to measure adherence to medication, since it is a simple, sensitive, low cost test containing few questions, and does a good job of expressing the patient's behavior in relation to their prescription[20].

Analysis of results and statistics

The data were tabulated in Microsoft Excel® 2010 and exported to the IBM SPSS Statistics® program version 20, through which descriptive and analytical treatment was performed. The descriptive statistics included the calculation of frequencies and measures of central tendency (mean and median) and dispersion (standard deviation and interquartile range).

Inferential statistics were applied to search for an association between follow-up in health services and adherence to HT medication. Because MGT has only four questions, in order to better understand its results, the answers to each question were analyzed separately, so as to obtain knowledge on the difficulties of the participants in adhering to the antihypertensive treatment. Furthermore, the total sum of the responses was also considered, with 1 point being assigned to each properly answered question. From the summation, the outcome variable (mean adherence of the studied group to the antihypertensive treatment) was calculated. The predictors were factors associated with health services. Answers to questions involving these factors were categorized in a dichotomous manner to allow for a comparison between the means of adherence (Mann–Whitney U test). All continuous variables were tested for normality using the Kolmogorov–Smirnov test. To assign significance to test results, *p*-values lower than 0.05 ($p < 0.05$) were considered.

RESULTS

Among 270 participants, the majority was female (53.0%). Age ranged from 26 to 89 years, with a predominance of the elderly (191, 70.7%; = 64.8 ± 10.1 years), as show in Table 1.

Table 1 – Distribution of participants, according to sociodemographic and blood pressure data, Fortaleza, Ceará, Brazil, 2017

Variables	Statistics (N = 270)
Age in years, mean (SD)	64.8 (10.1)
Female sex, n (%)	143 (53.0)
Blood pressure (mmHg)	
Systolic, median (IQR)	128 (24)
Diastolic, median (IQR)	72 (16)
HT associated with DM, n (%)	118 (43.7)

Notes: SD = Standard deviation; n = sample; IQR = Interquartile range; DM = Diabetes mellitus

Table 2 – Distribution of the participants, according to answers to the Morisky–Green Test, Fortaleza, Ceará, Brazil, 2017

MGT	n (%)	CI 95%
No problem remembering to take the medicine	187 (69.3)	63.8 - 74.8
Not careless about taking the medicine	178 (65.9)	60.3 - 71.5
Does not stop taking the medicine when feeling well	245 (90.7)	87.3 - 94.1
Does not stop taking the medicine when feeling sick	244 (90.4)	86.9 - 93.9

Note: MGT = Morisky–Green Test.

Table 3 – Adherence to HT medical treatment, according to variables of follow-up received by participants in health services, Fortaleza, Ceará, Brazil, 2017

Variables	n	MGT Mean ± SD	*p* value*
Hiperdia enrollment			
Yes	196	3.2±1.1	0.370
No	74	3.1±1.1	
Hospital admission in the last 2 years			
0–1	225	3.2±1.1	0.346
2–3	45	3.0±1.2	
Medical emergency in the last 2 years			
0 — 1	213	3.2±1.1	0.046
2 — 3	57	2.9±1.2	
Medical consultation in the last 2 years			
0 — 1	173	3.1±1.2	0.741
2 — 4	96	3.2±1.0	
Has been to a Basic Health Unit (BHU) in the last 2 years			
0 — 1	76	3.2±1.0	0.733
2 — 6	192	3.1±1.2	
Felt welcome at the BHU			
Yes	179	3.2±1.1	0.125
No	91	3.0±1.2	
Felt welcome at the doctor's office			
Yes	74	3.0±1.2	0.109
No	196	3.2±1.1	
Difficulties of transportation to BHU			
Yes	61	3.1±1.2	0.565
No	209	3.2±1.1	
Medical consultation in the last 12 months			
0 — 3	86	3.1±1.1	0.345
4 — 6	180	3.2±1.2	
Nursing consultation in the last 12 months			
0 — 3	120	3.0±1.1	0.022
4 — 6	142	3.3±1.1	
Date of last consultation before admission			
Up to 6 months ago	226	3.2±1.1	0.007
More than 7 months ago	31	2.5±1.4	
Last guidance on CVA care			
Up to 6 months ago	219	3.2±1.1	0.013
More than 7 months ago	30	2.6±1.4	

*Notes: *Mann–Whitney U test; MGT = Morisky–Green Test; BHU = Basic Health Unit*

Mean arterial pressure at the time of admission can be classified as normal. Only 43.7% of the participants were diagnosed with diabetes mellitus (DM) in association with HT. There was no statistically significant difference in adherence by participants with HT versus patients with HT and DM ($p = 0.668$).

Adherence to pharmacological treatment, measured through MGT, was 63.0%. As shown in Table 2, the greatest adherence problem identified through the application of MGT was related to carelessness in taking the medication, the item yielding the lowest percentage (65.9%) of positive answers.

The MGT-obtained adherence means were analyzed and compared to characteristics of the follow-up received by the study's participants in the health services, as seen in Table 3.

Enrollment in the Hiperdia program had no statistical significance in regard to differences in therapeutic adherence ($p = 0.370$). The sample had the following characteristics: few hospitalizations in the last two years (83.3%); low frequency of attendance at secondary care consultations (inpatient clinics/ambulatory care) (64.3%); no difficulty of transportation to the UBS (77.4%); high frequency of UBS attendance (71.6%); feeling of being welcome at the UBS (66.3%), but no feeling of being welcome during outpatient consultations (72.6%).

Adherence varied according to the number of times the patient entered the emergency service in the last two years: those who did not seek emergency care, or did so only once, had better adherence when compared to those with higher admission frequency ($p = 0.046$).

Data on the frequency of attendance at primary care consultations in the last year allowed us to infer that patients attended more doctor consultations (67.6%) than nursing consultations (54.2%). Adherence as measured by MGT was better for those who attended nursing consultations more frequently (from 4 to 6 times in the last year) ($p = 0.022$).

There was a predominance of patients who received some kind of consultation up to six months before the time of admission (87.9%, $p = 0.007$) or received guidance on CVA care (84.5%; $p = 0.013$). When taking place not long before the time of admission, both follow-up practices had a significant influence on the adherence to antihypertensive drug treatment; as such, these patients had better MGT results.

DISCUSSION

The level of therapeutic adherence in different populations of hypertensive patients in Brazil is frequently investigated, given the severity of the problem. Studies which applied the MGT to Brazilian populations with hypertension (but no associated cardiovascular disease) have identified adherence rates between 36%[21] and 57%[7].

The adherence identified in the population studied here was higher (63%), possibly influenced by the characteristics of the participants, who had cardiovascular disease associated with arterial hypertension and, consequently, needed and sought health care more frequently. As evidenced by the findings of this research, the higher attendance at consultations has a statistically significant relationship with better medication adherence, which reinforces the notion that accessibility and frequent use of health services impacts strongly on the health conditions of hypertensive patients with associated cardiovascular disease. In addition, other investigations corroborate the finding by pointing out an increase in therapeutic adherence of patients with hypertension after the occurrence of complications of the disease[22–23].

We believe that the presence of cardiovascular diseases associated with hypertension leads the patient to need and, consequently, seek health services more frequently. This has an impact on antihypertensive therapy adherence, since, as evidenced by our findings, there is a statistically significant relationship between greater attendance to consultations and better adherence to medication. Furthermore, this finding is proven by other studies, which demonstrate a greater therapeutic adherence of hypertensive patients after they go through disease complications[22–23].

However, the adherence deficit presented by the population suffering from hypertension and associated cardiopathy, although lower than that of the non-cardiopathic HT population, negatively influences patients' prognosis and coexistence with the disease.

Lack of medication intake was the main obstacle in the way of adherence for the studied patients, corroborating the results of other studies on hypertensive populations[24–25]. The discontinuation of antihypertensive medication caused by forgetfulness or incorrect timing leads to pressure oscillations that compromise control and facilitate the occurrence of negative cardiovascular events, such as acute myocardial infarction and angina[26]. It should be emphasized that such events were causes of hospitalization for the participants of this study, strengthening the thesis of a relationship between their occurrence and low adherence to medication.

Focusing on a population with high demand for health care due to the association of hypertension and cardiovascular disease, this research showed that non-adherence was related to factors of accessibility and use of health services, in consonance with other studies[27–28]. Although the majority of participants was enrolled in Hiperdia (72.6%), follow-up in this primary health care program was not able to influence adherence to antihypertensive treatment ($p = 0.370$). This finding corroborates literature reports on the high proportion of hypertensive patients who sustain uncontrolled blood pressure levels despite follow-up in the program[29].

The importance of follow-up in health services was also analyzed in terms of the association between the level of therapeutic adherence and the occurrence of acute events. Participants who did not seek emergency services in the last two years had better adherence rates ($p = 0.04$). Since acute episodes usually lead to the introduction of new drugs in the treatment protocol of HT patients, the lower adherence of the group which sought emergency services may be related to the difficulty of adapting to combination therapy[30–31], which demands post-discharge follow-up.

An European study showed that therapeutic adherence after the occurrence of acute myocardial infarction is more strongly associated with the guidelines provided by the inpatient hospital than by the routines of primary health care[32]. Such a relationship is yet to be explored in the Brazilian reality, but it may be a fundamental aspect in the maintenance of therapeutic adherence after hospital discharge.

In this study, we sought to advance knowledge concerning the correlation between health services and medication adherence when investigating the HT patient's attendance at nursing consultations, since these are mainly focused on health education. Despite the fact that the participants had a greater number of medical appointments than nursing consultations, drug adherence was better for those who attended nursing consultations more frequently ($p = 0.022$). This finding corroborates similar evidence linking nursing follow-up to increased medication adherence in people with cardiovascular disease[33–35]. At the

same time, our study goes beyond this corroboration by also indicating the appropriate number of consultations necessary to improve the therapeutic adherence of HT patients.

Excessive nursing follow-up does not necessarily result in greater therapeutic adherence, and can generate unnecessary costs for the health system[36]. The parameter found by this study of 4 to 6 nursing consultations per year is the recommended level of nursing follow-up, considering it proves enough to achieve better levels of antihypertensive medication adherence.

It was also observed that patients with hypertension who attended medical and nursing consultations or who received health orientations in the last six months presented greater therapeutic adherence, with a statistically significant correlation ($p = 0.013$). Primary care professionals have a high capacity and opportunity to influence the improvement of patients' medication adherence, through the provision of guidelines and care during visits, home visits, health education actions and tracking of non-adherent behaviors[14].

In view of the impact of follow-up in primary health services on therapeutic adherence of hypertensive patients, directed public policies are essential to strengthen this level of attention, bringing it closer to the population. Also meriting consideration is the Brazilian population's social capital, which helps people overcome barriers in the accessibility and use of health services by providing information and treatment support. For HT patients, the insertion in social health networks encourages them to seek specialized health services, even if the decision to participate in treatment follow-up has to come from patients themselves[37]. However, medication adherence will certainly be influenced by their social health network insertion and by the availability of follow-up appointments in the health system.

Limitations of this study

This research was only able to collect data during hospitalization; this did not allow for a comparison with medication adherence after the occurrence of the cardiovascular event.

Contributions to the area of nursing, health or public policy

We believe that this study's identification of an association between HT patient's follow-up in health services and medication adherence will contribute to remodeling primary care services and post-discharge follow-up for the portion of these patients who underwent cardiovascular events. In addition, the study adds to the empirical framework necessary for the orientation of public health policies for people with hypertension, regarding their social health networks and the availability of services.

CONCLUSION

The study identified a 63% rate of adherence to antihypertensive treatment in people with hypertension and associated cardiovascular disease; this adherence deficit was primarily caused by carelessness in taking the medication. The presence of self-reported diabetes or follow-up in the Hiperdia program were not statistically associated with the rate of adherence.

Factors related to follow-up in the health services which positively influenced adherence to the antihypertensive drug treatment were: few admissions to emergency services; having attended 4 to 6 nursing consultations per year; having had a doctor or nursing consultation not long before hospitalization, and having received counseling on CVA care in the last six months.

These findings provide support for the reorientation of health services and their public policies in order to generalize the attainment of the blood pressure target for HT patients, by increasing antihypertensive therapeutic adherence.

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