

Relationship of Adherence to Treatment and Blood Pressure Control in Outpatients. Registry on Hypertension in the Andean Region of the 42nd Parallel (REHTACAP 42)

Cardiovascular disease is the leading cause of death in Argentina, and hypertension (HTN) is one of the most important risk factors given its high prevalence and the difficulties in achieving the goals proposed by national and international guidelines on this entity. Poor adherence to drug therapy is a public health issue that hinders the achievement of those goals, particularly in countries with great social and economic difficulties. The 8-item Morisky Medication Adherence Scale (8-MMAS) is one of the tools used to measure the level of adherence to antihypertensive medications, and has been widely used and validated in different languages around the world. (1) There are reports on the use of the 4-item Morisky-Green-Levine Medication Adherence Scale in Argentina (2), predecessor of the scale used in this work, but no papers of this tool for measuring adherence to treatment of HTN in Argentina have been published. An important contribution to understand the risk factors in Argentina has been the data from the National Survey on Risk Factors carried out by the National Ministry of Health in 2005, 2009, and 2013; however, data published in scientific journals from small towns are sparse, where their inhabitants' characteristics and habits are different from people living in other areas of the country. The purpose of this study is to identify the levels of HTN control and their relationship with the adherence to treatment in outpatient settings of the Andean Region of the 42nd Parallel.

A prospective registry of consecutive hypertensive outpatients under drug therapy for at least 6 months was performed between May 2015 and April 2016. The first consultation was done in two private offices in El Bolsón city (Río Negro), and a private office in Epuyén (Chubut). Patients between 20-80 years of age were enrolled and pregnant women, secondary hypertensive patients, and patients who refused to sign the informed consent form were excluded. Demographic data, blood pressure (BP), drug therapy, and level of adherence were recorded, according to an 8-MMAS scale translated into Spanish. A score of 8 was considered high adherence, 6 and 7 was medium adherence, and a score ≤ 5 and BP ≥ 140 and/or 90 mm Hg was considered low adherence. Participants were asked about their compliance with medication schedules, and whether they had seen their doctor over the past year. Statistical analysis was performed with the chi-square test to measure the association between HTN control and (high or medium versus low) adherence, and with Student's *t* test or the Mann-Whitney test

depending on the type of sample distribution for systolic and diastolic BP recordings; a *p* value <0.05 was considered significant.

A total of 164 patients aged 65.1 (± 10.1) years were enrolled: 62.2% women, 63.4% with incomplete secondary school education, and 1.4% without health coverage. Fifty percent of patients had history of dyslipidemia, 18.9% of diabetes, 13.4% of smoking, 50.0% of obesity, 13.4% of coronary artery disease, 3.7% of heart failure, and 5.5% of atrial fibrillation. Mean years of antihypertensive treatment was 10.2 (± 9.3) years; 89.0% took one or two pills to treat HTN, 90.8% took one or two antihypertensive medications and a total average of 3.7 (± 2.3) pills per patient was taken, adding those prescribed to control BP and the medications prescribed for other conditions. There were differences in the characteristics of the adherent group (A, high or medium adherence) versus the non-adherent group (no A, low adherence): group A had a higher level of instruction and higher percentage of dyslipidemic participants (Table 1). Hypertension was the reason for consultation in 62 patients (37.8%), preoperative evaluation in 45 (27.4%), and other reasons in 57 (34.8%). Median systolic BP was 150.0 mmHg (interquartile range 136-164), and median diastolic BP was 80.0 mm Hg (73-88). Hypertension was present in 70.7% of patients, 36.6% with grade II or III. Mean 8-MMAS score was 6.1 (± 1.9); 38.4% of patients were non-adherents, 28.0% had medium adherence, and 33.5% high adherence. Medication schedules were not complied with in 26.4% of cases and 32.3% had not seen the doctor who managed their HTN over the past year. Forgetfulness was the most common cause of non-adherence (54.0%), followed by feeling better (28.6%), and possible adverse effects (12.7%). There was no difference in HTN as per the level of adherence to medications (*p* = 0.117) or in the values of diastolic BP (*p* = 0.072), but there was a difference in the levels of systolic BP (*p* = 0.042) (Table 2).

In a population of essential hypertensive patients under drug therapy consulting in an outpatient office of the Andean Region of the 42nd Parallel, a low level of BP control at the expense of systolic BP was observed, a finding related to the age group participating in the study. Most participants take one or two pills to treat their HTN, and one or two antihypertensive medications (sometimes combined in only one pill), suggesting a non-intensive treatment for their BP values. The levels of adherence were acceptable compared with similar studies, being higher than those carried out in underdeveloped countries, and lower than those with higher income. (3-6) It was concluded that the studied population had an acceptable level of adherence to antihypertensive treatment with poor control of BP values. An association between adher-

	Adherence (n = 101)	Non-adherence (n = 63)	p
Age, years, mean	65.5	64.5	0.661
Female sex, %	67.3	54.0	0.086
Incomplete secondary school education, %	56.4	74.6	0.018*
Dyslipidemia, %	56.4	39.7	0.036*
Diabetes, %	17.8	20.6	0.650
Smoking, %	10.9	17.5	0.229
Obesity (BMI ≥ 30), %	46.5	53.8	0.700
Ischemic heart disease, %	10.9	17.5	0.229
Heart failure, %	2.0	6.3	0.147
Atrial fibrillation, %	5.9	4.8	0.747
N° of pills/day, mean	3.8	3.6	0.421
N° of antihypertensive pills/day, mean	1.59	1.63	0.88

BMI: Body mass index. *Significant.

Table 1. Characteristics of the population as per level of adherence (medium or high vs. low)

	Adherence	Non-adherence	p
SBP, median (IQR)	147 (135-161)	157 (140-168)	0.0416*
DBP, median (IQR)	79 (72-86)	83 (75-92)	0.0727
No control of BP, %	63.3	77.8	0.1172

IQR: Interquartile range. SBP: Systolic blood pressure. DBP: Diastolic blood pressure. BP: Blood pressure. *Significant.

Table 2. Relationship between level of adherence (medium or high vs. low) to drug therapy and control of blood pressure

ence and systolic BP and tendency in diastolic BP was found but no relationship between adherence and HTN control when analyzed as a qualitative variable. Larger studies could demonstrate such association. Building strategies to improve the levels of patients' adherence and doctors' prescription for more intensive treatments could increase the number of patients achieving BP goals suggested by the guidelines.

Conflicts of interest

None declared.

(See authors' conflicts of interest forms on the website/Supplementary material).

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Use of Intravenous Beta-Blockers in Dobutamine Stress Echocardiography

Stress echocardiography is a first-line study for the detection of myocardial ischemia, supported by several scientific studies since it was first introduced some four decades ago. While physical exercise is the most widely used stressor, about one third of patients cannot perform it properly due to musculoskeletal issues. For this group of patients, dobutamine and dipyridamole are the most commonly used drugs. (1)

Dobutamine is a short half-life synthetic catecholamine obtained from the molecular structure of isoproterenol, which mainly acts on β -1 receptors (and