

Factors associated to treatment failure in hypertensive patients requiring hospital admission

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ARTICLE INFORMATION

Recibido: July 9, 2018
Accepted: August 16, 2018

Competing interests

The authors declare no competing interests

Acronyms

BP: Blood pressure
CKD: Chronic kidney disease
CRF: Cardiovascular risk factor
HBP: High blood pressure

ABSTRACT

Introduction: High blood pressure is a very frequent disease that, in spite of multiple advances in therapy, continues to be poorly controlled and frequently leads to decompensation requiring hospitalization or emergency services.

Objectives: To identify the factors associated to treatment failure in hypertensive patients requiring hospital admission, due to disturbances related to blood pressure control.

Method: There were studied 40 hypertensive patients who were admitted in the Marta Abreu health area, during 2016; the data of clinical histories were taken into account and patients and relatives were interviewed in order to identify the causes that influenced the treatment failure.

Results: Admissions of males and patients over 60 years predominated. The most frequent risk factors were smoking, diabetes mellitus and ischemic heart disease, and the main causes of poor control of blood pressure were the inadequate treatments (45%) and non-adherence to treatment (30%). The first three causes of admission were stroke (40%), acute coronary syndrome (27.5%) and hypertensive crisis (7.5%). After correcting the risk stratification, the coincidence with the previous stratification was only 10% and 95% of the patients were at high risk.

Conclusions: The most frequent causes of admission were of cardiovascular origin. Treatments failed for being inadequate or the lack of patient adherence. Most of them had incorrect stratification, thus, treatments were mostly inadequate and the control was poor.

Keywords: High blood pressure, Treatment adherence and compliance, Hospital admission, Causality

Factores asociados al fracaso del tratamiento en pacientes hipertensos que requieren ingreso hospitalario

RESUMEN

Introducción: La hipertensión es una enfermedad muy frecuente que, a pesar de los múltiples adelantos en la terapéutica, sigue siendo mal controlada y frecuentemente lleva a descompensaciones que requieren hospitalización o atención en los servicios de emergencia.

Objetivo: Identificar los factores relacionados con el fracaso terapéutico en los pacientes hipertensos que requirieron ingreso hospitalario a causa de afectaciones relacionadas con el control de la presión arterial.

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Método: Se estudiaron los 40 pacientes hipertensos ingresados en el área de salud Marta Abreu durante el año 2016, se tomaron los datos de las historias clínicas y se entrevistaron los pacientes y familiares para identificar las causas que influyeron en el fracaso del tratamiento.

Resultados: Predominaron los pacientes del sexo masculino y mayores de 60 años, los factores de riesgo más frecuentes fueron: el hábito de fumar, la diabetes mellitus y la cardiopatía isquémica, y se encontraron como principales causas del mal control de la presión arterial los tratamientos inadecuados (45%) y la no adherencia al tratamiento (30%). Las tres primeras causas de ingreso fueron: accidentes cerebrovasculares (40%), síndrome coronario agudo (27,5%) y crisis hipertensiva (7,5%). Después de corregir la estratificación de riesgo la coincidencia con la estratificación previa fue solo del 10%, y el 95% de los pacientes fueron de alto riesgo.

Conclusiones: Las causas de ingreso más frecuentes fueron de origen cardiovascular. Los tratamientos fracasaron por ser inadecuados o por la falta de adherencia de los pacientes. La mayoría de ellos tenían una estratificación incorrecta, por lo que los tratamientos fueron en su mayoría inadecuados y el control deficiente.

Palabras clave: Hipertensión arterial, Cumplimiento y adherencia al tratamiento, Ingreso hospitalario, Causalidad

INTRODUCTION

The high blood pressure (HBP) is the most frequent chronic condition in the adult population; it behaves as a factor that increases the risk of cardiovascular diseases including ischemic heart disease, stroke and heart failure¹.

Only 19.4% of hypertensive patients with treatment are under control, regardless of the available medical and technical resources. The percentage of controlled hypertensive patients varies from 5.4% in Korea to 58% in Barbados; in the USA it is 36.8% and in Egypt and China is 8%².

In Cuba, according to the Statistical Yearbook of Health of 2017, the prevalence by dispensarization showed a rate of 225.1 and 234.2 per thousand for the country and Villa Clara, respectively. Within the most affected provinces by deaths due to heart disease, Villa Clara was in fourth place with a total of 1.939 deaths for a gross rate of 247.6 per 100.000 inhabitants, 25 points higher than the previous year³.

Despite making a greater disclosure about the need to control cardiovascular risk factors (CRF) and the need to incorporate healthy lifestyles, there is no greater perception of the problem or a change in the practices of the population.

In the health area of the Policlínico Marta Abreu of Santa Clara (Villa Clara, Cuba) there is a high prevalence of hypertensive patients. Just in the year 2017 there was a total of 8052 cases, with a higher prevalence among women and patients older than 65 years. In a study conducted in that same popula-

tion, in 2015, was found that the mortality from direct causes of cardiovascular origin was higher than 75% in hypertensive patients and the basic cause of cardiovascular death was greater than 60%, while in non-hypertensive patients the basic causes of death from this source was only 6%^{4,5}.

One of the factors that favor the high incidence of cardiovascular complications is the low effectiveness of the treatment in known patients, either because they have no prescription or because it does not achieve control of desired blood pressure (BP) levels; this generates frequent decompensations, complications and admissions.

METHOD

A descriptive and transversal research was carried out, with the aim of identifying the factors related to the therapeutic failure in the hypertensive patients that required hospital admission or due to affectations related to the BP control. The study included 40 hypertensive patients over 18 years, which represented the total number of patients admitted to the health area of the Policlínico Marta Abreu in the hospitals of the municipality of Santa Clara, from January 1st to December 31st, 2016.

The medical records of the patients were reviewed, and patients included in the study were interviewed as well as their relatives, in order to determine the control level of BP prior to admission. There were defined the comorbidity and risk stratifi-

cation of patients before admission, and this last was corrected when it did not correspond to the information obtained.

The variables studied were: age, sex, CRF, comorbidity, evolution time from the diagnosis of the disease and cause of hospital admission.

In order to perform the risk stratification, the following were considered as CRF: smoking habit, diabetes mellitus, dyslipidemia, overweight or obesity, sedentary lifestyle and unhealthy diets. As target organ damage or manifested disease: ischemic heart disease, stroke, peripheral arterial disease, chronic kidney disease (IIIa degree or higher according to the formula Cockcroft-Gault and according to the Kidney Diseases Outcomes Quality Initiative classification), and the HBP seriousness classification was used according to the Cuban Hypertension Guide of 2017⁶.

The data obtained were tabulated and expressed in absolute and relative frequencies, as corresponding.

The consent of all patients was asked for their inclusion in the research, and the confidentiality of the information and its use for purely scientific purposes was guaranteed.

RESULTS

The average age of the sample was 72.4 ± 19.7 years and the average time of evolution of high blood pressure was 23.4 ± 9.2 years. The distribution, by age and sex of hypertensive patients admitted, is shown in **table 1**, 95% of patients were over 60 years with a predominance of males (57.5%); women were all over 60 years.

In **table 2** are shown the main causes for admission of hypertensive patients. Strokes ranked first with a total of 16 patients (40%), followed by the acute coronary syndrome with 11 (27.5 %); while among the causes of admission for non-cardiovascular diseases, the most frequent was chronic kidney disease (CKD) with 7.5%.

The smoking habit was the most frequent FR C (68.3%), as can be seen in **table 3**, followed by diabetes mellitus and hypercholesterolemia present, both n and 53.7% of patients.

Table 1. Distribution by age and sex of admitted hypertensive patients.

Cause	Men		Women		Total	
	Nº	%	Nº	%	Nº	%
Under 60 years of age	2	8.7	0	0.0	2	5.0
Over 60 years of age	21	91.3	17	100.0	38	95.0
Total	23	57.5	17	42.5	40	100.0

Source: Survey and individual and family clinical history.

The main cause of therapeutic failure (**Table 4**) was the inadequate treatment (45%), followed by the non-adherence to the treatment (30%), together these causes –both avoidable–, represented 75% of the

Table 2. Causes for admission of hypertensive patients (n=40).

Cause	Nº	%
Stroke	16	40.0
Acute coronary syndrome	11	27.5
Hypertensive crisis	3	7.5
Chronic kidney disease	3	7.5
Heart failure	3	7.5
Atrioventricular block	2	5.0
Atrial fibrillation	1	2.5
Hypertensive cardiomyopathy	1	2.5

Source: Survey and individual and family clinical history.

Table 3. Risk factors and comorbidity present in admitted hypertensive patients (n=40).

Risk factor	Nº	%
Smoking	28	70.0
Diabetes mellitus	22	55.0
Ischemic heart disease	22	55.0
Hypercholesterolemia	22	55.0
Obesity	16	40.0
Chronic obstructive pulmonary disease	6	15.0
Chronic kidney disease	2	5.0

Source: Survey and individual and family clinical history.

causes of treatment failure..

In **table 5** is shown the stratification of total cardiovascular risk before admission and after correction, which shows that 45 % of the admitted patients had not been previously stratified, and from the 30% that had been stratified as moderate risk only 5% were correctly classified. After correcting the stratification, 95% of the patients studied turned out to be high risk and the remained 5%, moderate risk.

Table 4. Causes of treatment failure in admitted hypertensive patients (n=40).

Cause	Nº	%
Inadequate treatment	18	45.0
Non-adherence to treatment	12	30.0
Bad eating habits	6	15.0
Poor follow-up	4	10.0

Source: Survey and individual and family clinical history.

Table 5. Previous and corrected cardiovascular risk stratification in admitted hypertensive patients.

Strtification	Previous	%	Corrected	%	Concordant	%
High risk	10	25.0	38	95.0	10	100.0
Moderate	12	30.0	2	5.0	2	16.7
Non-stratify	18	45.0	0	0.0	0	0.0

Source: Survey and individual and family clinical history.

Note: The total concordance was of 30%.

DISCUSSION

Although in general, the HBP has a similar frequency in men and women, it is suggested that after 60 years the prevalence among women increases, i.e. the results of this study, which found a predominance of the male sex, may be contradictory; but because it was aimed at hospitalized patients, this fact can be explained by the greater severity of the effects on target organs and the higher incidence of decompensation among men. A study in Santiago de Cuba in 2016 reported similar results in terms of preva-

lence by sex in hospitalized patients⁷.

As the damages of HBP on the target organ is mainly of vascular origin, it is logical that the underlying causes of admission have been cardiovascular diseases and CKD, that is also importantly related to HBP, especially in diabetic patients. A previous study conducted in the same population had already shown high cardiovascular mortality among hypertensive patients compared with non-hypertensive patients⁵, which agrees with the fact that the most frequent causes of admission are also of cardiovascular origin.

The risk factors most frequently found were smoking and diabetes mellitus, both of which contribute to the increase the appearance of complications and decompensation. There are studies that coincide in the high prevalence of smoking among hypertensive patients. Although this could be explained by the high prevalence of smoking in the general population. An observational study conducted in Cárdenas, in order to identify the factors associated with the control of high blood pressure, which included 330 patients dispensed in the urban

stratum of that municipality in 2009, found that from the nine variables that were significant in the bivariate analysis, five showed a significant association with uncontrolled high blood pressure, adjusting a logistic regression model; of these, the one that most contributed to the lack of control of HBP, independently, was the smoking habit⁸.

The treatment failure in hypertensive patients depends on multiple factors. In this study, inadequate treatment and non-therapeutic adherence were identified as the main causes of decompensation, taking into account that the pharmacological treatment and guidelines on lifestyles are a responsibility of the physician, and their performance, consciously and active, of patients; we can say that the treatment failure was due to poor selection of drug treatment and the need for better communication by the physician, and a lack of risk perception on the patients' side, therefore, all responsibilities are shared almost equally between both parties.

The National Study on Adherence to Treatment

in Argentina⁹ found that 52% of patients abandoned the treatment before the year, which also raised the inadequate control of HBP. These results match those obtained in the Hospital Clínico Quirúrgico Hermanos Ameijeiras of Havana, where the factors influencing the lack of control of HBP were studied, divided depending of the doctor or the patient, where they found that the indication of an inadequate treatment in the first case, and non-adherence in the second, were the most frequent¹⁰. The results found in the present study are very similar, and further research should be designed to identify the causes that lead the physician to not optimize the treatment despite the availability of information and resources to do so.

In a study in 2014, at the Hospital Reina Sofía of Córdoba, where refractory hypertensive patients to BP control were interviewed, from primary care, was found that a quarter referred to breaches in treatment, results that are very similar to those found in this study, and it was concluded that the lack of adherence to treatment is manifested by a lack of will among refractory hypertensive patients, rather than by an information problem¹¹.

For many patients with HBP, adherence to treatment becomes difficult mainly when they need several medications for their control and also, that many patients, for not presenting symptoms, do not consider necessary to be strict in complying with the medical indications and easily leave the treatment totally or partially.

The low level of HBP control is also related to clinical inertia, when the doctor does not make changes in the treatment of hypertensive patients who are not controlled, because adequate doses are not prescribed or the therapeutic combinations are not synergistic in patients with high risk, hence, the control fails; in the case of elderly patients, there is a fear of drastic reductions in BP or there is a criterion, not always justified, of accepting higher figures for considering them normal in this age group, without making a prior effort to reduce them to the established figures.

Difficulties in the stratification have a multifactorial character. A research that considered risk stratification in uncomplicated hypertensive patients, performed in the same population in which this study was conducted, also found an important disparity in the risk stratification, especially because it did not adequately consider the target organs' injury¹². A study to detect the prevalence of CKD in hypertensive patients found that up to 37.2% were II

and III stage CKD with normal creatinine and proper control of the BP¹³.

If the patient is not properly stratified, the therapeutic choice may not be optimal, and this may be one explanation of the high frequency with which treatments were inadequate.

It is not considered mandatory to stratify the patients, but to dispense them according to the risk groups established by the Integral General Medicine program, therefore this process is not systematically controlled. The present study was not designed to establish the causes of the lack of adherence to the treatment but the doctor-patient communication, and the perception of risk of the latter may have played an important role, if we take into account other studies carried out in this sense^{11,14}.

The results of this research suggest that in order to achieve better control of HBP is necessary to improve the interest of physicians in the patient's stratification and to design studies to find and modify the causes of the lack of adherence to treatment. The solution for these problems could reduce the decompensation and hospital admissions of hypertensive patients.

CONCLUSIONS

It can be concluded that the most frequent causes of admission were of cardiovascular origin and that the stratification was poor in the majority of patients. Inadequate treatments and non-therapeutic adherence caused treatment failure in most cases.

REFERENCES

1. Pérez Caballero MD, León Álvarez JL, Fernández Arias MA. El control de la hipertensión arterial: un problema no resuelto. *Rev Cuban Med [Internet]*. 2011 [citado 12 Jun 2018];50(3):311-23. Disponible en: <http://scielo.sld.cu/pdf/med/v50n3/med09311.pdf>
2. Mejía-Rodríguez O, Paniagua-Sierra R, Valencia-Ortiz MR, Ruiz-García J, Figueroa-Núñez B, Roa-Sánchez V. Factores relacionados con el descontrol de la presión arterial. *Salud Pública Méx.* 2009;51(4):291-7.
3. Ministerio de Salud Pública. Anuario Estadístico de Salud 2017. La Habana: Dirección de Registros Médicos y Estadísticas de Salud; 2018.
4. Cairo Sáez G, Rodríguez Molina D, Batista Her-

- nández NE, González Delgado Y, Mayea Moya Y, González Monzón MO. Estratificación de riesgo y complicaciones isquémicas en pacientes hipertensos. *Medicentro* [Internet]. 2016 [citado 15 Jun 2018];20(3):176-84. Disponible en: <http://www.medicentro.sld.cu/index.php/medicentro/article/view/2131/1699>
5. Cairo Sáez G, Batista Hernández NE, Pérez Guerra LE, Muñiz Casas I, Pino Mildestein T. Mortalidad por hipertensión arterial en el área de salud del Policlínico Universitario «Marta Abreu». *Medicentro* [Internet]. 2017 [citado 5 julio 2018];21(2):120-6. Disponible en: <http://www.medicentro.sld.cu/index.php/medicentro/article/view/2236/1946>
 6. Pérez Caballero MD, León Álvarez JL, Dueñas Herrera A, Alfonzo Guerra JP, Navarro Despaigne DA, de la Noval García R, et al. Guía cubana de diagnóstico, evaluación y tratamiento de la hipertensión arterial. *Rev Cuban Med* [Internet]. 2017 [citado 18 Jun 2018];56(4):242-321. Disponible en: <http://scielo.sld.cu/pdf/med/v56n4/med01417.pdf>
 7. García Céspedes ME, Prusakov Martínez A, Ales Martínez E, Carbonell García IC. Tendencias y pronósticos de la hipertensión arterial en la provincia de Santiago de Cuba (2001-2015). *MEDISAN* [Internet]. 2016 [citado 21 Jun 2018];20(4):433-43. Disponible en: <http://medisan.sld.cu/index.php/san/article/view/808/pdf>
 8. Alfonso Godoy K, Achiong Estupiñan F, Achiong Alemañy M, Achiong Alemañy F, Fernández Alfonso J, Delgado Pérez L. Factores asociados al hipertenso no controlado. *Rev Med Electrón* [Internet]. 2011 [citado 25 Jun 2018];33(3):278-85. Disponible en: <http://www.revmedicaelectronica.sld.cu/index.php/rme/article/view/829/pdf>
 9. Ingramo RA, Vita N, Bendersky M, Arnolt M, Bellido C, Piskorz D, et al. Estudio Nacional Sobre Adherencia al Tratamiento (ENSAT). *Rev Fed Arg Cardiol*. 2005;34(1):104-11.
 10. León Álvarez JL, Pérez Caballero MD, Guerra Ibáñez G. Cinco años de experiencia en consulta especializada de hipertensión arterial complicada (2008-2012). *Rev Cuban Med* [Internet]. 2013 [citado 28 Jun 2018];52(4):254-64. Disponible en: <http://scielo.sld.cu/pdf/med/v52n4/med04413.pdf>
 11. Zurera Delgado I, Caballero Villarraso MT, Ruíz García M. Análisis de los factores que determinan la adherencia terapéutica del paciente hipertenso. *Enferm Nefrol*. 2014;17(4):251-60.
 12. Cairo Sáez G, Pérez Rodríguez RM, Ferrer Suarez V. Kidney affectation in non-complicated high blood pressure patients. *Curr Res Cardiol*. 2017; 4(4):65-8.
 13. Pozuelos Estrada G, Molina Martínez L, Romero Perera JJ, Díaz Herrera N, Cañón Barroso L, Buitrago Ramírez F. Prevalencia de insuficiencia renal oculta estimada mediante fórmulas de cálculo del grado de función renal en hipertensos mayores de 60 años, remitidos para medición ambulatoria de la presión arterial. *Aten Primaria*. 2007; 39(5):247-53.
 14. Ramos Morales LE. La adherencia al tratamiento en las enfermedades crónicas. *Rev Cuba Angiol Cir Vasc* [Internet]. 2015 [citado 8 Jul 2018];16(2): 175-89. Disponible en: <http://scielo.sld.cu/pdf/ang/v16n2/ang06215.pdf>