

## Continuity of patient care and patient control with high blood pressure at the first stage of medical attention

### *Continuidad de cuidado y control de pacientes con hipertensión arterial en el primer nivel de atención*

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#### Summary

**Objective:** to compare the blood pressure numbers of patients with high blood pressure with and without continuity of care at the first stage of medical attention. **Methods:** a multicenter cross-sectional study was conducted in three family medicine units in a public institution. A family medicine information system was used to review the electronic files of patients with high blood pressure from July 2018 to June 2019. The systematic sample was used to complete the size of sample 358 for each group of patients, with and without continuity of medical care. It was determined that continuity existed when the continuity of care index was  $\geq 0.7$ , getting also clinical variables. **Results:** of 701 electronic files of patients with high blood pressure, there was an average continuity of care index of  $0.68 \pm 0.23$ , without differences between the group of patients, with and without continuity of care, with variables: control of high blood pressure, evolution period of high blood pressure, number of patients that were assisted in the emergency departments due to uncontrolled hypertension, antihypertensive medications used and high blood pressure control. **Conclusions:** There was found, no relation between continuity of patient care and high blood pressure control.

**Keywords:** Continuity of Patient Care; Physician-Patient Relations; Arterial Hypertension

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## Resumen

**Objetivo:** comparar las cifras de presión en pacientes con hipertensión arterial con y sin continuidad de cuidado en el primer nivel de atención. **Métodos:** estudio transversal multicéntrico realizado en tres unidades de medicina familiar de una institución pública. Se utilizó el Sistema de Información de Medicina Familiar para revisar expedientes electrónicos de pacientes con hipertensión arterial, en los meses de julio de 2018 a junio de 2019. El muestreo fue probabilístico sistemático hasta completar el tamaño de muestra de 358 en cada grupo de pacientes, con y sin continuidad de cuidado. Se determinó que existía continuidad cuando el Índice de Continuidad de Cuidado era  $\geq 0.75$ ; se obtuvieron, además, variables clínicas. **Resultados:** de 701 expedientes electrónicos de pacientes con hipertensión arterial, se obtuvo un promedio de Índice de Continuidad de Cuidado de  $0.68 \pm 0.23$ . Sin diferencia entre el grupo de pacientes, con y sin continuidad de cuidado, con las variables: control de hipertensión arterial, tiempo de evolución de hipertensión arterial, número de pacientes que acudieron a urgencias por descontrol hipertensivo, de medicamentos antihipertensivos utilizados y de consultas en el año. **Conclusiones:** no se encontró relación entre continuidad de cuidado y control de la presión arterial.

**Palabras clave:** continuidad de la atención al paciente, relación médico-paciente, hipertensión arterial

## Introduction

High blood pressure (HBP) or arterial hypertension in Mexico is considered a chronic disease responsible for 18%

of defunctions and the main risk factor for preventable deaths.<sup>1</sup>

Among the considerable factors for proper control of tension, numbers are related to the health care system, the doctor, and the patient;<sup>2</sup> these factors have been widely documented, however, there is a component poorly studied in Mexico: the continuity of patient care; this characteristic defines the practice of family medicines and represents a central attribute of primary care. The continuity of patient care is defined as a sequence of doctor's visits, in which there is a mechanism of information transference, that implied a loyalty contract for the patient and a clinical commitment to the doctor.<sup>3</sup>

Continuity of care includes the continuity of the information, considering the organization's perspectives, guidelines, and medical records, seeing the same provider in each visit is not a requirement, longitudinal continuity, and interpersonal continuity in which patients see the same care provider in each visit.<sup>2</sup> These last two components had been evaluated in several ways,<sup>4</sup> the most common of them is the usual provider continuity index (UPCI): which is the quotient obtained of the total number of visits of the patient with the same condition during a year, between the number of visits of the patient with the general practitioner. A UPC index of zero denotes no continuity and the patient has had consultations with different doctors, while an index of one reflects perfect continuity, which means a followed up with the usual provider.<sup>2,5</sup>

Patients with high continuity of care show fewer hospital admissions<sup>6</sup> and drug interactions,<sup>7</sup> greater satisfaction between doctor and patient,<sup>8,9</sup> better adherence to treatment, improve-

ment of refill of medicines, bigger trust in the local provider,<sup>12</sup> a better quality of physical and emotional life, and lower mortality rates.<sup>13,14</sup> On the other hand, the lack of continuity of care has been related to the increase in hospitalization and mortality rates, health expenditure,<sup>15</sup> worse glycemic control, and dyslipidemia,<sup>16</sup> higher health costs,<sup>17</sup> more emergency department visits, and more complications.<sup>18</sup>

So far, a clear relationship between the continuity of care and better control of high body pressure (HBP) hasn't been proven, due to the attention provided to a greater number of patients in the first stage of medical attention making it possible to find out the continuity of care. The objective of this study consisted of comparing the tensional numbers of patients with arterial hypertension, making it possible to calculate the continuity of care.

The objective of this study was to compare the tensional numbers in patients with arterial hypertension with or without continuity of care at the first stage of medical attention.

## Material and methods

A multicenter cross-sectional study was performed on three units located in an urban area in the States of Baja California, Nuevo León y Veracruz at the first level of medical attention. A family medicine information system (FMIS) was used to review the electronic files of patients with high blood pressure affiliated with a health care institution, without distinction of sex, over 20 years old, with at least a year of diagnosis, medical notes of control in a period of 12 months (from July 2018 to June 2019) until the completion of the sample for each group. Those files that did

not have a record of the main variables were eliminated. Systematic sampling and difference of sample proportions formula were used, and a confidence level of 95%,  $\alpha = 0.05$  statistical power of 80%, and size of the sample of 358 patients in each group (with or without continuity of care). Access to surveys of patients with HBP was granted and the total samples were proportionally distributed among the participating medical units.

For this study purpose, UPCI was used, a value  $\geq 0.75$  was considered as continuity of care  $y \leq 0.74$ , denoting no continuity; the studies that used this index did not mention a defined cut-off point, despite it, this index is one of the most used.<sup>19</sup>

Clinical characteristics were also obtained: BP numbers from each of the patient's visits (control values for systolic BP were determined not greater than 140 mmHg and diastolic BP not greater than 90 mmHg), time of evolution of HBP, the antihypertensive medication used, consultation visits a year, number of visits to the emergency room due to uncontrolled hypertension among other variables such as age and sex.

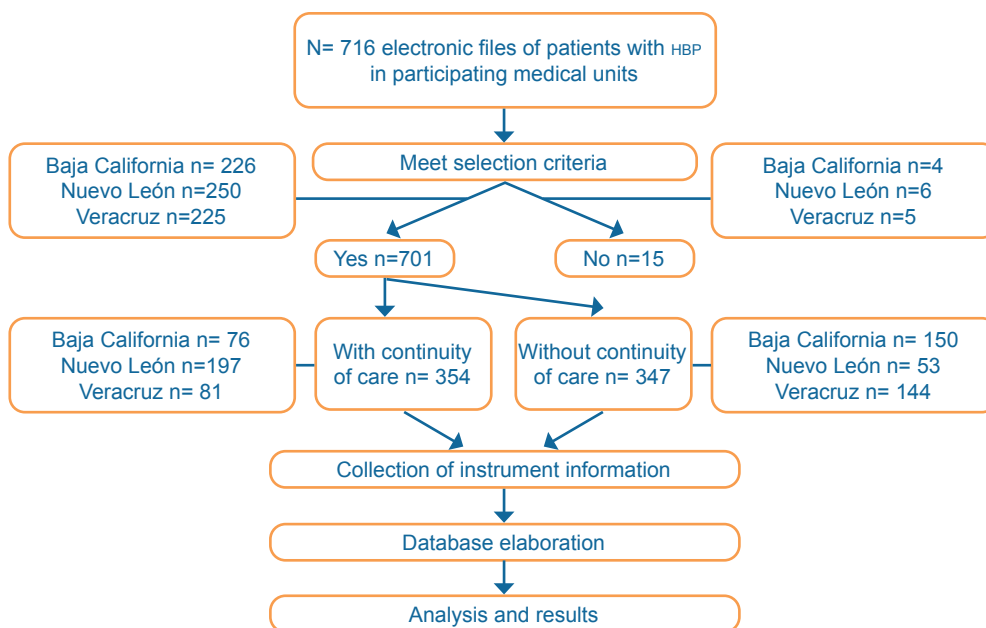
Before authorization by the director of each participating medical unit, the investigators selected electronic files through systematic sampling to collect medical instrument data.

Figure 1 shows the patients' distribution.

The Online Electronic Registration System approved the project of the Health Research Coordination (SIREL-CIS in Spanish) of the Mexican Institute of Social Security, under registration R-2016-785-071.

The collected data were entered into databases in Excel. For statistical analysis, the program SPSS v. 22 was used. Absolute and relative frequencies for variables were estimated:  $\chi^2$  was used for nominal and ordinal categorical variables and student t-test for independent groups. For continuous variables, a value of  $p < 0.05$  was used as statistical significance. The Kolmogorov-Smirnov statistic for testing data normality was used.

**Figure 1. Patients distribution**



## Results

701 electronic files of patients with HBP were analyzed (found by region with a higher proportion in Baja California 226, followed by Nuevo León 250, and then Veracruz 225) 15 were excluded due to incomplete data records.

347 electronic files belonged to the group of patients without continuity of care (found by region with a higher proportion in Baja California 150, followed by Veracruz 144 and then Nuevo León 53, and). 354 belonged to the group with continuity of care (found by region with a higher proportion Nuevo León 197, followed by Veracruz 81, and then Baja California 76). All the above correspond to 97.9% total of the calculated sample.

Overall, the UPCI range was from 0 (absences of continuity of patient care) to 1 (total continuity of patient care) averaging  $0.68 \pm 0.23$ . Each participating unit by region represents: 0.63 Baja California, 0.81 Nuevo León and 0.58 Veracruz. 82% of the patients with controlled blood pressure and, 97% total of

the patients in this study used a type of hypertensive medication.

According to the groups that were formed, the female sex predominated with 60.5% (n=210) in the group of patients without continuity of care and 65.5% (n=232) in the group of patients with continuity of care ( $p = 0.16$ ), the average age of 62.2 years old  $\pm 13.4$  and 59.9 years old  $\pm 13.5$ , respectively ( $p = 0.02$ )

A significant statistical difference was not found among the group of patients with or without continuity of care, with variables such as progression in years (median  $7.4 \pm 6.8$  / median  $8.4 \pm 8$ ), the number of antihypertensive medications used ( $1.68 \pm .7$  / media  $1.65 \pm .7$ ) and the number of consultation during a year (median  $7.5 \pm 2.8$  / median  $7.1 \pm 2.7$ ), respectively.

The number of hypertensive crises was low (continuity of care patients 4.5%/16 and without continuity 4.6%/16), they were present in younger patients, and those with a diagnosis from 16 to 20 years of hypertension

progression. The HBP control for each group of patients with or without continuity of care is shown in table 1.

## Discussion

In relation to the control of the tensional numbers, the percentage found was higher than those found in national and international studies,<sup>1,2,20-23</sup> this might be attributed to the fact that the patients of this study have social security medical attention, allowing a longitudinal continuity, therefore better control of their HBP; in addition, having a usual place to go for medical care increase three times the probability of better control of tensional numbers.<sup>22</sup>

Also counting with an electronic file (information continuity) in a health institution, teamwork, and standard medical attention,<sup>2</sup> regardless of the interpersonal continuity of care, might influence HBP control.

The average continuity of care in the patients of this sample was similar to Korea,<sup>18</sup> and higher than in Malaysia.<sup>2</sup> With the categorization of the group of patients with or without continuity of care it is important to note that the concept of continuity is multidimensional and difficult to be determined with a single methodology, an approach is the UPCI, however, the results of this index are less sensitive according to the distribution of consultations from different healthcare providers to the usual one, without considering the number of providers consulted; it is also influenced by the level of use since its value decreases as the number of consultations from different healthcare providers to the regular increases, ignoring the consultation sequences such as the frequency of communication and coordination between the healthcare providers. Des-

**Table 1. Control of HBP with continuity of care**

	Uncontrolled BP frequency (%) n=124	Control BP frequency (%) n=577	Value p*
Continued	59 (47.6)	295 (51.1)	0.47
Without continuity	65 (52.4)	282 (48.9)	

BP: Blood Pressure. \*Fisher test

pite it, the UPCI is one of the most used in literacy.<sup>23</sup> The group of patients with or without continuity of care did not show differences in the variables of sex, age, time of disease progression, and consultation number at year, just as was observed in China,<sup>13</sup> however, in Korea newly diagnosed patients with arterial hypertension found differences on these variables.<sup>18</sup>

About the BP control, among the groups of patients with or without continuity of care no differences were found, the same as in Malaysia,<sup>2</sup> Mexico City, and North Carolina, on the contrary, Reddy et al.<sup>26</sup> reported better control of BP in patients that continue with the same healthcare provider, the same as Qiu et al.<sup>27</sup> and Khanam et al.<sup>28</sup>

Yet in patients with chronic renal disease and HBP, these differences suggest that the quality of longitudinal and information continuity might influence BP control regardless of the continuity of care index. About all the above, it should be noted that patients who participated in this study have social security medical attention, therefore, a follow-up of their medical providers (longitudinal continuity), plus the participating medical units have records of standard information (information continuity) available to be consulted by the providers, therefore if the healthcare provider changes the continuity of care endured.

It has been proved that turnover in the primary attention of the healthcare provider is associated with a low level of patient satisfaction, this does not affect the quality of the attention of the healthcare provider,<sup>25</sup> this situation might explain the high number of patients with control of tensional numbers, despite of the continuity of care.

Among the limits of this study must be considered its prospective nature based on clinical files and transversal design, which don't allow assessment modifications during the therapy, also the results are applied only to patients of primary attention affiliated to a social security healthcare clinique. Variables as type and attachment to treatment, comorbidities, attachment to HBP guidelines' treatment, and aspects related to the provider-patient relationship. UPCI accordances were used.

It is considered one of the strengths of this study its multicentric feature; a probabilistic sample of a population of 67,025 patients with arterial hypertension was included, held by 107 family doctors of different regions of medical units in Mexico, that belong to the public healthcare institution that serves to 52% of the patients around the country, including data for a 12-month period.<sup>29</sup>

It is highly recommended to perform more research studies with a prospective design, in populations of patients with arterial hypertension in medical units, in which continuity of care is absent or waiting in line for consultation in recurrent patients is used and compare them to those that secure the continuity of care, it is also important to take into consideration other factors that might influence the BP control.

### Conclusions

There was found, no relation between continuity of patient care and high blood pressure control, due to the strong longitudinal and information continuity, nevertheless, these results reframe if the continuity of patient care is only applied to certain pathologies or if it influences other characteristics of the medical attention process.

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