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Hypertensive Control and Follow-Up in UNIFILA Clinics in Subjects with Systemic Arterial Hypertension in a First-Level Care Unit

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Abstract

Objective: To identify hypertensive control in subjects with systemic arterial hypertension (SAH) aged 20 to 60 years at follow-up in secondment clinics versus UNIFILA clinics. **Methods**: observational, cross-sectional, and analytical study in subjects with SAH in a first-level unit, during the period from November 2022 to November 2023. Hypertensive control was defined as subjects with blood pressure <130/80 mmHg. Simple Odds Prevalence Ratios (PMRs) were calculated by comparing baseline characteristics with UNIFILA and hypertensive lack of control. A multiple binary logistic regression (MLR) model was constructed considering the outcome (hypertensive lack of control) and confounding variables (UNIFILA, comorbidities, female sex). **Results**: Out of a total of 200 subjects, 147 (73.1%) were women, and 99 (49.3%) were followed up at UNIFILA. Of the latter, 76 (38%) had hypertensive decontrol than in the no-fit model with an RMP of 5.9 with 95% CI (3.12-11.08). In the RLM, the female sex had a PMR of 1.51 with a 95% CI (0.75-3.06) and the follow-up in the UNIFILA clinic presented a PMR of 6.35 with a 95% CI (3.36-11.90). **Conclusions**: Based on observational data, it is shown that attending follow-up in UNIFILA clinics is a risk factor for hypertensive decontrol. Prospective cohort studies are required to confirm the findings shown here.

Keywords: Systemic Arterial Hypertension; Hypertensive Control; UNIFILA Initiative; First Level of Care

Introduction

Systemic Arterial Hypertension (SAH) is defined as a chronic degenerative disease characterized by increased Blood pressure (BP) above 140/90 mmHg is known as a silent disease, since it does not always have a clinical presentation and its identification is late, which can cause damage to the target organ without being diagnosed in a timely manner; It is the main risk factor for cardiovascular diseases, which has a greater impact on their morbidity and mortality. [1,2]

According to the World Health Organization (WHO) and the Pan American Health Organization (PAHO), there are 1.28 billion adults between the ages of 30 and 79 with SAH equivalent to 30% of the population, most of them living in low- and middle-income countries. 46% of adults are unaware that they have hypertension and only one in five who are under treatment (21%) are under control. [3,4]

According to Mexico's National Health and Nutrition Survey 2022 (ENSANUT 2022), the prevalence of SAH in adults over 20 years of age was 26.4% (27.7% in women and 31.3% in men), increasing in line with the age of the population [5] Likewise, it mentions that the prevalence of adults over 20 years of age with controlled BP (blood pressure) (<130/80mmHg) was 33.7%, and the female sex with greater control was 37.9% 95% CI (22.6-34.0) [6]. The diagnosis of SAH is clinical, with several separate BP measurements in the office or by home monitoring, ambulatory BP monitoring (ABPM) to improve the subject's conditions, at different times with a number >140/90 mmHg [7–10].

The Mexican Institute of Social Security (IMSS) is the largest social security agency in Latin America, for the year 2023 it had more than 500 thousand workers, seven National Medical Centers (CMN), 25 High Specialty Medical Units (UMAE), 251 hospitals, 1526 Family Medicine Units (UMF), 123 Social Security Centers, five Centers and 41 Medical Research Units, Biomedical, Epidemiology and Health Services; 12 sports units, 38 theatres, 60 shops, 18 wakes, 1323 nurseries and 4 resorts [11].

Based on the Comprehensive Care Protocols (PAI), a subject is considered to be under hypertensive control when he or she has BP <130/80 mmHg and no less than 110/70 mmHg in the medium and long term. In patients with type 2 diabetes (T2D) or kidney damage no greater than 30 ml/min/1.73m2, the target should also be <130/80mmHg. Finally, in senile patients with carotid atherosclerosis, the goal is <150/90 mmHg [1,8]. Modification of the lifestyle of subjects with SAH is the main management, the three main ones being the DASH diet, decreasing salt intake to <5 g/day (2g of sodium) and losing weight [12,13].

As of 2014, the UNIFILA initiative was created in the IMSS with the aim of reducing the waiting time, without distinction of sex, age, acute or chronic pathology, workers, minors in daycare centers, thus contributing to improving the quality of medical care and chronic non-communicable diseases, such as SAH. It is described for patients without an appointment, transferring patients to a different clinic where an appointment was cancelled, to improve their satisfaction, so that they receive medical care in the first available office, thus reducing the waiting time, which previously had an average of more than one hour. Its general implementation began in 2016 [14].

In the FMUs at the IMSS, the time allocated for first-level outpatient consultation is modified by multiple factors. Among others, due to the transfer of the patient to an assigned office of the UNIFILA initiative, to personal factors of the patients, such as: personality, education, age, sex, mental state and communication. The personality and work style of the primary care physician, such as: mood, motivation, communication skills, clinical interviewing, paternalism, and problem-solving skills [15].

This can alter therapeutic adherence, hypertensive control, and in general, Agreed recommendations from a healthcare provider. [16–18]. It has been documented that follow-up with the same family doctor (secondment office) to provide continuity and establish a better communication and doctor-patient relationship, so that the patient is in a comfortable, receptive and comfortable environment, where he or she has greater confidence to express his or her doubts, concerns and insecurities, can be reflected in better hypertensive control. Likewise, the continuity and longitudinality of medical care can allow the first-level physician to detect the external factors that influence poor therapeutic adherence and hypertensive lack of control and implement solution strategies [19].

The present work aims to respond to the association of hypertensive control and medical care in UNIFILA clinics in a first-level unit at the IMSS. The above association is not yet documented in the scientific literature, so it is essential to demonstrate it as a risk or protective factor for the control of chronic non-communicable diseases, such as SAH.

Materials and Methods

Type of study and objective

An observational, cross-sectional and analytical study was conducted. During the period from November 2022 to November 2023. The primary objective was to associate hypertensive control in subjects with SAH with follow-up in secondment clinics compared to UNIFILA clinics.

Subject

A sample size was calculated using the statistical calculator EPIINFO v. 7.2 [20]. An alpha of 0.05% and a 1-B of 20% were used, with an uncontrolled prevalence of SAH with follow-up in the referral clinic of 40% and a prevalence of uncontrolled SAH without follow-up in the referral clinic of 60%. It was considered a 1:1 exposed/unexposed ratio. An n=200 was obtained. The type of sampling used was non-probabilistic, for consecutive cases in the Family Medicine Unit No. 64 "Tequexquinahuac".

Subjects aged 20 to 60 years with a diagnosis of SAH with a period of more than 6 months of diagnosis were included, likewise, subjects with comorbidities such as T2D and Chronic Kidney Disease (CKD) with glomerular filtration rate greater than 30ml/min/1.73m2 were admitted to the study. Subjects with pharmacological therapy for single, dual, or triple SAH were admitted. Subjects with secondary hypertension, attributed to pregnancy, hyperthyroidism, and subjects with emotional disorders were excluded.

Ethical Issues and Informed Consent

Subjects were informed about the details of the study, the main objective, and the questionnaire used. Those who agreed to participate were granted an informed consent and privacy notice for the use of the information provided by them. The procedures carried out in this research were authorized with registration number R-2022-1408-039, approved by the Local Research Committee 1408 and the Local Research Ethics Committee 1408-8 of the IMSS.

Measurement

Blood pressure

The blood pressure figure was obtained from the electronic medical record in previously diagnosed subjects, taking the blood pressure values from the last consultation. The outcome variable, hypertensive control, was defined as a blood pressure figure <130/80 mmHg [1,6].

Data Sheet and Therapeutic Adherence

A questionnaire was carried out in which sociodemographic and clinical variables of the subjects were identified, likewise, the 8-item Morisky Green Levine Test was applied, with Cronbach's coefficient of alpha (alpha = 0.80), sensitivity 86% and specificity 56% [17,21,22]. The therapeutic adherence variable was dichotomized into adherent and non-adherent according to the score obtained, less than 8 points non-adherent and adherent 8 points [23,24].

Statistics

Frequencies and percentages were obtained using the SPSS version 27 in a descriptive analysis phase, for the qualitative variables (sex, hypertensive control, medical care office, comorbidities and therapeutic adherence). For the quantitative variables (age, systolic blood pressure and diastolic blood pressure) their type of distribution was determined using form criteria such as asymmetry (-0.05 to 0.05), kurtosis (-0.02-0.02) and statistical criteria using the Kolmogorov-Smirnov test, considering $p > 0.05$ as a non-Gaussian distribution, median and interquartile ranges (IQR) were used 25.75. As well as mean and standard deviation (SD) in the case of Gaussian distribution.

In the bivariate phase, Pearson's Chi-square (value expected by chance >5) was used for the association of dichotomous variables (second-guess clinic and UNIFILA clinic) with hypertensive control and lack of control and was considered statistically significant with a $p < 0.05$. RMP and 95% CI were calculated.

A multivariate model was constructed, which considered possible confounding factors that had an impact on hypertensive lack of control (UNIFILA clinic, male sex and comorbidities), through an RLM, taking into consideration clinical relevance, statistical significance and/or risk tendency. Considering the variables previously analyzed in the unadjusted model. Crude and

adjusted RMPs were obtained with a 95% CI and p-value. The results were represented by a Forest Plot using GraphPad Software, LLC, 2365 Northsi-de Dr., Suite 560, San Diego, CA 92108, USA.

Results

Of the 200 subjects studied with a diagnosis of systemic arterial hypertension, 73.1% were female. The median age was 53 years (46, 58). Regarding schooling, basic education predominated with 66.6% and subjects with a partner in 81.7%. Subjects with some comorbidity were 45.3%. 49.3% of those who attend follow-up at the UNIFILA initiative clinic; 55.7% had lack of control and 46.8% had low adherence (Table 1).

General Characteristics	N (%) = 200
Female*	147 (73.1)
Age, years **	53 (23,58)
Marital status *	
Single	22 (10.9)
Married	110 (54.7)
Divorced	18 (9.0)
Widower	23 (11.4)
Common-law marriage	27 (13.4)
Degree of studies *	
No scholar education	10 (5.0)
Primary	70 (34.8)
High school	64 (31.8)
High school	42 (20.9)
Degree	14 (7.0)
Comorbidities *	
No	109 (54.2)
Yes	91 (45.3)
Evolution time, months**	120 (42,216)
Treatment*	
Unique	89 (44.3)
Dual	80 (39.8)
Triple	31 (15.4)
Consulting room*	
Ascription	101 (50.2)
UNIFILA	99 (49.3)
Hypertensive control*	
Out of control	112 (55.7)
Control	88 (43.8)
Systolic blood pressure, mmHg, ***	126.5 (18.1)
Diastolic blood pressure, mmHg ***	78.3 (13.0)
Therapeutic Adherence *	
Low	94 (46.8)
Medium	54 (26.9)
High	52 (25.9)
*Variables expressed in frequencies and percentages	
**Variables expressed in medians and interquartile ranges (RIQ 25,75)	
***variables expressed in means and standard deviation (SD)	

Table 1. Characteristics of subjects with SAH who are treated in a first-level unit.

The baseline characteristics of the subjects were contrasted with the follow-up in the UNIFILA clinic and the secondment clinic. Regarding sex, a predominance of men was found, with 52.8% attending the UNIFILA clinic. The median age of the subjects attending the UNIFILA clinic for follow-up was 54 years (IQR) (26.65). 30.5% of the subjects are married and attend the clinic. Primary schooling was found in 19.5% of the subjects who attended the clinic. Comorbidity was present in 28.5% of the subjects who were followed up at UNIFILA. In 24% of the subjects who attended the UNIFILA clinic, the treatment was single, with 20% of the subjects with dual treatment both in the UNIFILA clinic and in the secondment clinic. Low adherence of 30.5% was found in subjects who attended UNIFILA. (Table 2)

General Characteristics	Secondment Clinic n=101	Doctor's Office UNIFILA n=99	p
Sex[a]			0.57
Female	76 (75.2)	71 (71.7)	
Male	25 (24.8)	28 (28.2)	
Age, years.[b]	53 (26,60)	54 (29,65)	<0.05
Marital status[a]			
Bachelor	10 (9.9)	12 (12.1)	0.42
Married	61 (60.3)	49 (49.5)	
Divorced	6 (5.9)	12 (12.1)	
Widower	12 (11.8)	11 (11.1)	
Common-law Marriage	12 (11.8)	15 (15.1)	
Degree of studies[a]			
No Scholar education	6 (5.9)	4 (4.0)	0.25
Primary	39 (38.6)	31 (31.3)	
High school	35 (34.6)	29 (29.3)	
High school	16 (15.8)	26 (26.3)	
Degree	5 (4.9)	9 (9.0)	
Comorbidities[a]			0.38
Yes	49 (48.5)	42 (42.4)	
No	52 (51.5)	57 (57.6)	
Treatment[a]			
Unique	41 (40.6)	48 (48.5)	0.2
Dual	40 (39.6)	40 (40.4)	
Triple	20 (19.8)	11 (11.1)	
Therapeutic adherence[a]			
Low	33 (33.3)	61 (61.6)	<0.05
Medium	33 (33.3)	21 (21.2)	
High	35 (34.6)	17 (17.2)	
Systolic blood pressure, mmHg c	119.52 (16.7)	133.64 (16.7)	<0.05
Diastolic blood pressure, mmHg c	73.94 (12.8)	82.85 (11.5)	<0.05

A Variables expressed in frequency and percentages, Pearson's chi-square test is used.
b Variables expressed in median and IQR (25.75), using the Mann-Whitney U test.
c Variables expressed in means and SD, unpaired Student's t-test was used.

Table 2: Characteristics of Subjects with SAH According to Follow-Up Clinics

The baseline characteristics of the study subjects were contrasted with the outcome (hypertensive lack of control). The median age of subjects with uncontrolled SAH was 53 years (46,58). Regarding sex, it was found that 42.5% of the female subjects had hypertensive lack of control. When the age variable is dichotomized, 48.5% of the population is in the range of 41-60 years. Poor adherence was found in 55% with hypertensive lack of control (Table 3).

General Variable	Out of control n=112	Control n=88	*p*	OR (IC al 95%)
Sex				
Female	85 (75.8)	62 (70.5)	0.24 a	1.32 (0.70-2.47)
Male	27 (24.1)	26 (29.5)		
Age, median years, IQR	53 (25,60)	54 (48,59)	<0.05 c	----------
Age by Ranges				
41-60 years	97 (86.6)	81 (92.1)	0.11 a	0.55 (0.21-1.43)
20-40 years	15 (13.4)	7 (7.9)		
Marital status				
Bachelor	13 (11.6)	9 (10.2)	0.82 c	----------
Married	59 (52.7)	51 (57.9)		
Divorced	11 (9.8)	7 (7.9)		
Widower	15 (13.4)	8 (9.0)		
Common-law marriage	14 (12.5)	13 (14.8)		
Schooling				
No scholar education	5 (4.5)	5 (5.7)	0.69 a	0.776 (0.217-2.769)
Studied	107 (95.5)	83 (94.3)		
Degree of studies				
No scholar education	5 (4.5)	5 (5.7)	0.74 d	----------
Primary	36 (32.1)	34 (38.6)		
High school	39 (34.8)	25 (28.4)		
High school	23 (20.5)	19 (21.6)		
Degree	9 (8.0)	5 (5.7)		
Comorbidities				
Yes	53 (47.3)	38 (43.2)	0.56 a	1.18 (0.67-2.07)
No	59 (52.7)	50 (56.8)		
Treatment				
Unique	53 (47.3)	36 (40.9)	0.54 c	
Dual	44 (39.2)	36 (40.9)		
Triple	15 (13.4)	16 (18.1)		
Therapeutic adherence				
Low	84 (75.0)	10 (11.3)	<0.05 c	----------
Medium	26 (23.2)	28 (31.8)		

High	2 (1.7)	50 (56.8)		
Tests Used a Pearson's Chi Square; b U Mann Whitney; c Linear Trend Test IQR: Interquartile Ranges (25,75)				

Table 3. Characteristics of subjects with SAH according to hypertensive control.

A total of 38% of subjects with hypertensive lack of control presented 38% of patients attending the UNIFILA clinic, with an odds ratio (OR) of 5.9 (3.12-11.08) and a p <0.05 (Table 4).

Follow-up Doctor's office	Hypertensive control		*p**	OR con IC at 95%
	Out of control n (%) =112	Control n (%) =88		
UNIFILA n (%) =99	76 (38.0)	23 (11.5)	<0.05	5.9 (3.12-11.08)
Ascription n (%) =101	36 (18.0)	65 (32.5)		
*Pearson's Chi Square Test; PMR: Odds Ratio of Prevalence				

Table 4: Follow-up in the UNIFILA clinic and hypertensive control in subjects with SAH.

Multivariate Results

Multivariate analysis was performed using multiple logistic regression adjusted for hypertensive decontrol, finding an OR and 95% CI of 1.51 (0.75-3.06); for the presence of comorbidities in subjects with SAH, an OR and 95% CI of 1.36 (0.71-2.55) was obtained, and a 95% OR and 95% CI of 6.32 (3.36-11.9) were obtained for the presence of comorbidities in subjects with SAH. (Table 5) (Figure 1)

	UNADJUSTED			ADJUSTED		
Variable	OR	CI 95%	*p*	OR	CI 95%	*p*
Female	1.32	0.70-2.47	0.38	1.51	0.75-3.06	0.24
Comorbidities	0.84	0.48-1.48	0.56	1.36	0.71-2.55	0.32
Consulting room UNIFILA	5.9	3.12-11.08	<0.05	6.32	3.36-11.9	<0.05
Multiple Logistic Regression Model						

Table 5: Multivariate analysis. Risk Factors for Hypertensive Dyscontrol in Subjects with Systemic Arterial Hypertension of FMU 64.

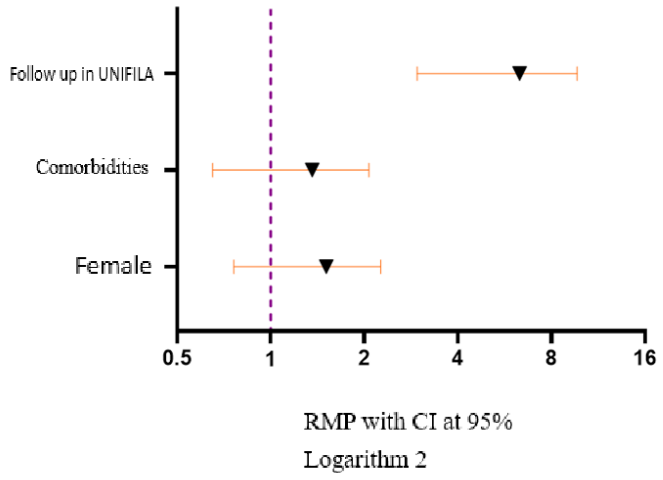

Figure 1: Risk Factors for Hypertensive Dyscontrol, Multivariate Analysis.

Discussion

The main objective of this study was to associate the UNIFILA initiative with the lack of control of subjects with SAH. It was identified that more than half of the subjects with SAH are female. The presence of genes at birth, cardiac output is 10% higher, 10% less systemic vascular resistance leads to higher pulse pressure and higher heart rate in women. The decrease in estrogen in menopause, specifically 17-B estradiol, alters the endothelium value and develops greater hypertensive decontrol [25]. Based on ENSANUT 2022[26] The prevalence of hypertension in males in Mexico is 53.8% different from what was described in this study. Edelmiro and his collaborators concluded that 57.13% were female. [27].

It was identified that patients > A 41-year-old patient had greater hypertensive control. The older the age, the greater the vascular resistance and the lower the cardiac output, increasing the risk of having SAH, generating a longer time of evolution of SAH and greater knowledge about the medications ingested for the control of BP [28–30]. The result obtained is convergent with those found in ENSANUT 2022 [31], subjects <40 years of age had better hypertensive control (41.6%). Vivencio Barrios and his collaborators identified hypertensive control in 62.3% of patients <45 years of age. Concluding lower hypertensive control with increasing age [32].

Of the total population studied, 55.7% had hypertensive lack of control. Contrary to the research carried out in a first-level unit in Zapopan, Jalisco, when they were more than 5 years old, they developed hypertensive lack of control associated with the time of evolution from the date of diagnosis and start of pharmacological management [22].

A total of 30.5% of patients with low adherence were found in patients with follow-up at UNIFILA's office. By reducing the consultation time and not being the family doctor who provides the follow-up, a bad doctor-patient relationship can be generated. The short time (<15 minutes) modifies the quality of care, generating doubts, concerns and mistrust in the patient [33]. Beatriz Rosendo and her collaborators [34], identified dissatisfaction in patients who were treated in less time than the corresponding time, not carrying out the general measures and consumption of medications indicated. Neus Pages [16] The empowerment of the patient by the physician improves the doctor-patient professional relationship at each follow-up visit. The present research did not prioritize the sole study of adherence, so it gives rise to new studies on the factors involved in it to generate new strategies. In the study prepared by Erendira, Ruth and Andrea [19], obtained a high percentage of adherence (>80%) in patients with follow-up in a single clinic. In this research, it was shown that 53.5% of subjects with basic schooling have a lack of control. Predominantly at the primary and secondary levels. This situation may be conditioned by less knowledge about diseases and their treatment due to lack of knowledge. Beatriz Rosendo [34] He reports that people who have studied since primary school are under hypertensive control, as well as those who do not have studies.

Regarding the main objective, we found that follow-up in the UNIFILA clinic is a risk factor for hypertensive decontrol. Follow-up for a chronic non-communicable disease can decrease the physician's empathy and the patient's empathy; conditioning in turn alterations in the doctor-patient relationship with loss of the patient's trust in the doctor [35,36]. Jhon Dinkler et al. [37], determined that the usual source of care (USOC) is the clinic, doctor's office or hospital department in which the patients are monitored, it was obtained that those who attend follow-up in USOC are controlled in 54.8% and those who do not go to USOC are uncontrolled in 17%, obtaining a p with an OR with a 95% CI of 0.30 (0.19-0.41).

The lack of statistical significance in variables such as sex and comorbidities for hypertensive lack of control was compared by means of a sampling simulation, obtaining a similar p, so it can be stated that no sample size was needed, but rather events by group with control and hypertensive lack of control depending on the UNIFILA clinic and the clinic of affiliation.

A limitation of the present study is that, since it is a cross-sectional study, we cannot reliably establish the causal phenomenon between UNIFILA and hypertensive lack of control. One of the strengths is that measures of clinical relevance were obtained, based on the risk of UNIFILA and hypertensive lack of control was not limited only to p values as well as a simple model and a

multivariate model that took into account other factors that impact on lack of control. The results of this research can be extrapolated to Mexican subjects with characteristics similar to those presented in the present study, considering sex, age group, marital status and education.

Conclusions

Follow-up in UNIFILA clinics increases the probability of risk of hypertensive dyscontrol, in the simple and adjusted analysis. Additional studies are required, with a prospective cohort design, that can verify the findings shown here and the real impact of the UNIFILA initiative on Systemic Arterial Hypertension in the IMSS.

Disclosure

Authors' Contributions: Conceptualization, Y.A.M. and F.V.H..; methodology, M.G.S.M., L.R.G.C, and J.A.T.C; software, F.V.H.; validation, M.G.S.M, L.R.G.C, E.A.M.R..; formal analysis, F.V.H.; investigation, Y.A.M; resources, Y.A.M.; data curation, F.V.H.; writing-original draft preparation, Y.A.M.; writing-review and editing, F.. V. H and E.A.M.R; supervision, L.R.G. C., B.E.H.M. and J.A.T.C

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Statement from the Institutional Review Board: The procedures performed in this research were authorized with registration number R-2022-1408-039, approved by the Local Research Committee 1408 and the Local Research Ethics Committee 1408-8 of the IMSS. All subjects were assigned to Family Medicine Unit No. 64 "Tequexquinahuac", signed the informed consent form after receiving information about the study, the possible risks, benefits and were granted a notice of privacy, confidentiality and anonymity. Subjects were free to decide to terminate the collaboration.

Informed Consent Statement: All study subjects signed informed consent and privacy notice.

Data Availability Statement: Data supporting the study results can be provided followed by request sent to the corresponding author's e-mail.

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Conflict of Interest: The authors declare that they have no conflict of interest.

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