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Factors Associated with Poor Tension Control in Hypertensive Patients

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Abstract

Introduction: High blood pressure is a major public health issue affecting 1.28 billion people worldwide in 2019, making it the leading chronic disease. Blood pressure control remains particularly difficult, especially in sub-Saharan Africa. The objective of our study was to identify factors associated with poor blood pressure control in hypertensive patients followed up at the cardiology department of the Dalal Jamm National Hospital. **Patients and methods:** This was a retrospective, descriptive and analytical, single-center cross-sectional study conducted over a 12-month period from January 1, 2021 to December 31, 2021, involving hypertensive patients followed for at least 3 months. The parameters studied were sociodemographic data, cardiovascular risk factors associated with high blood pressure, clinical signs, therapeutic compliance, therapeutic aspects, blood pressure control, and factors associated with poor control. The data were analyzed using RStudio 4.6 software. **Result:** High blood pressure represented 26.6% (n = 722) of the reasons for consultations and 109 patients were included in the study. We found a female predominance with a sex ratio of 0.48. The mean age of the population was 61.9 years ± 12. The predominant age group was 60 - 80 years representing 67% (n = 73) of patients. Diabetics represented 30% (n = 33) all type 2, 40% (n = 43) had dyslipidemia, 58 women had reached menopause. Sedentary lifestyle was found in 76% of patients, 61% (n = 67) had a family history of hypertension. In addition, 43.5% of the population studied had more than 3 risk factors in addition to hypertension. Patient follow-up was irregular in 21.1%. The mean systolic blood pressure was 162.4 ± 21 mm Hg and diastolic 96.16 ± 13.6 mm Hg. The mean heart rate was 77.84 ± 18.01 beats per minute. Dieulafoy signs were reported in 58%

of patients. The low-sodium diet was respected by 77% of patients. Dual therapy was the most prescribed protocol with 42% (n = 46). Among the complications, heart failure was the most frequent (49%), followed by stroke (30%). The Girerd test was applied to assess therapeutic compliance, 30% of patients were good adherents, 43.5% had a minimal problem of adherence and 26.5% were not at all adherent. The blood pressure control rate was 53.20%. In bivariate analysis, sedentary lifestyle ($p < 0.0001$), irregular monitoring ($p = 0.0008$), poor compliance ($p < 0.0001$), herbal medicine ($p = 0.025$), and low socioeconomic level ($p = 0.007$) were the factors associated with poor blood pressure control. In multivariate analysis, poor compliance ($p < 0.00014$) was associated with lack of blood pressure control. **Conclusion:** The management of high blood pressure encounters significant difficulties, resulting in inadequate control of blood pressure figures. Blood pressure was not controlled in almost half of the patients. The factor of poor blood pressure control identified was therapeutic non-compliance. It is imperative to make care more accessible and promote therapeutic education.

Keywords

Arterial Hypertension, Therapeutic Compliance, Poor Blood Pressure Control, Dakar

1. Introduction

High blood pressure (HBP), according to the WHO, is defined as systolic blood pressure greater than or equal to 140 mm Hg and/or diastolic blood pressure greater than or equal to 90 mm Hg, measured twice, on different days [1] confirmed by self-measurement or ambulatory blood pressure measurement (ABPM).

It constitutes a major public health problem and is considered to be the leading chronic disease in the world [2]. In March 2023, a report from the World Health Organization (WHO) estimated that, despite a stable global prevalence, the absolute number of people aged 30 to 79 years suffering from hypertension has doubled, from 648 million in 1990 to 1.28 billion people in 2019 [1]. This is strongly linked to the increase in life expectancy and the increased exposure to risk of the population such as the increase in the number of obese or overweight subjects [3].

If the observed trends are confirmed by 2025, hypertension is expected to affect more than 1.5 billion people worldwide [4].

Developing countries will be the hardest hit by the burden of hypertension, which will be added to that of communicable diseases. The data available to us on the African continent are alarming since they indicate prevalence rates comparable, particularly in cities, to those observed in Western societies [5].

Furthermore, little data is currently available on the knowledge, treatment and control of HBP in sub-Saharan Africa. However, those that have been published are worrying. While the prevalence of hypertension is comparable in sub-Saharan

African cities and in Western cities, this is not the case for the rates of screening, treatment and control of the disease. All studies indicate that less than half of hypertensive people are aware of this health problem and that very few of them follow a treatment. Less than 10% of hypertensive patients in sub-Saharan Africa are controlled [5].

The objective of this work was to identify the factors associated with poor blood pressure control in hypertensive patients followed in the cardiology department of the Dalal Jamm National Hospital.

2. Patients and Methods

This was a retrospective, descriptive and analytical single-center study that took place from January 1, 2021 to December 31, 2021. It involved 109 files of hypertensive patients followed in the cardiology department of the Dalal Jamm National Hospital Center.

Patients were recruited after studying their files and agreeing to answer the questionnaire by telephone after free and informed consent in order to complete the data.

The inclusion criteria were as follows: any patient aged 18 years and over, known carrier of essential hypertension, followed in the department and treated for at least 03 months. We did not include patients who did not consent, were unreachable or unable to answer the questions due to cognitive or psychiatric disorders.

For each patient we assessed the socio-demographic data including the socio-economic level for which we used an estimation method involving different observable elements:

- Was he employed?
- Had he another source of income?
- Had he a heath care?
- Was he owner of his house?
- Was he able to pay for prescriptions and paraclinical examinations?

This assessment allowed us to classify the patients into 3 socio-economic levels:

- Low socio-economic level for a total of YES responses between 0 - 1;
- Medium socio-economic level for a total of YES responses between 2 - 3;
- High socio-economic level for a total of YES responses between 4 - 5.

We also collected cardiovascular risk factors (diabetes, dyslipidemia, obesity), lifestyle (smoking, regular physical activity: at least 30 to 45 min, 3 to 4 times a week by cycling, walking, running, swimming, etc.), clinical and paraclinical data. The data collected on hypertension were the duration of progression, quality of follow-up, treatment and therapeutic compliance by applying the GIRERD [6]. This test is used to assess the level of compliance, *i.e.* whether the treatment is taken regularly and as prescribed or during a consultation with a healthcare professional. The patient will have to answer "yes" or "no" to each question.

Questions:

- Did you forget to take your medication this morning?
- Have you run out of medication since your last consultation?
- Have you ever taken your medication late compared to the usual time?
- Have you ever missed taking your medication because some days your memory fails you?
- Have you ever missed taking your medication because some days you feel like your treatment is doing you more harm than good?
- Do you think you have too much medication to take?

Test interpretation:

Total yes = 0 Total yes = 1 or 2 Total yes ≥ 3

Score = 0: Good compliance

Score = 1 or 2: Minimal compliance problem

Score ≥ 3: Poor compliance

Blood pressure control was defined as blood pressure below 140/90 mm Hg.

The data collected were entered into Excel 2010 on a previously established form. The analysis was performed with RStudio 4.6 software. An in-depth approach was devoted to examining the relationships between variables using the Chi-square independence test. We analyzed the p-values to obtain significant perspectives on the potential links between the parameters studied. The significance level of the test was 5%. We had incorporated a logistic regression method to deepen our understanding of the relationships between the variables. The significance level of the test was 5%, but it also depended on the coefficient (Estimate).

3. Results

Among the 109 patients who participated in the study; there were 74 women and 35 men. The mean age was 61.9 ± 12.14 years and the most representative age group was 60 - 70 years. The majority of patients (51.4%) were educated. Sedentary lifestyle (76.1%; n = 83) was the most common cardiovascular risk factor and 43 patients (39.4%) had dyslipidemia. The mean duration of hypertension was 6.62 ± 4.62 years. It was at least 2 years in 85.3% of hypertensive patients. Irregular follow-up was noted in 21.1% (*i.e.* 23 patients). All patients were on antihypertensive treatment: 33% on monotherapy, 42.2% on dual therapy and 19.2% on triple therapy. The assessment of therapeutic compliance showed 30.3% of patients compliant, 31.2% non-compliant and 38.5% minimal compliance problems. The mean blood pressure was 162.4 ± 21/96.16 ± 13.6 mm Hg. Blood pressure was not controlled in 51 patients or 46.8% of patients.

The bivariate analysis found the following factors associated with poor blood pressure control: sedentary lifestyle ($p < 0.0001$), irregular monitoring ($p = 0.0008$), therapeutic non-compliance ($p < 0.0001$), taking oral herbal medicine ($p = 0.040$) and low socio-economic level ($p = 0.007$) (Table 1). Multivariate analysis revealed that therapeutic non-compliance was a factor associated with the lack of blood pressure control (Table 2).

Table 1. Bivariate analysis of variables associated with poor blood pressure control.

Variables	n (%)	p value
Gender		
Woman	33 (44.6)	0.542
Man	17 (48.6)	
Age group (years)		
[20 - 40[	4 (44.4)	0.9526
[40 - 60[	12 (44.4)	
[60 and +[	34 (47.9)	
Sedentary lifestyle		
Yes	38 (64.4)	**<0.0001**
No	13 (26.0)	
Duration of HBP development (years)		
[0 - 2 years]	8 (50)	0.9662
[+2 - 5 years]	22 (46.8)	
+5 years	21 (45.7)	
Quality of follow-up		
Regular	33 (38.4)	**0.0008**
Irregular	18 (78.3)	
Observance		
Good	4 (12.9)	**<0.001**
Minimal problems	15 (35.7)	
Bad	32 (88.9)	
Cumulative of FDRCV		
0	4 (66.7)	0.0905
1 - 2	17 (35.4)	
+3 FRCV	30 (54.5)	
Therapeutic protocol		
Monotherapy	15 (39.5)	
Bitherapy	25 (51.0)	0.3665
Triple therapy	9 (45.0)	
Quadritherapy	2 (100.0)	

Continued

Socio-economic level		
Low	21 (65.6)	**0.007**
Medium	16 (32.0)	
Good	4 (66.7)	
Phytotherapy		
Yes	23 (60.5)	**0.040**
No	27 (38.0)	

HBP: High Blood Pressure; **CVRF:** Cardiovascular Risk Factor.

Table 2. Multivariate analysis of variables associated with poor blood pressure control.

Coefficients				
	Estimate (coefficient)	Std.Error	z value	Pr (>|z|)
Intercept	2.85292	1.39711	2.042	0.04115
Quality monotoring	0.32741	0.76862	0.426	0.67013
Sedentary lifestyle	−1.08842	0.97798	−1.113	0.26574
Compliance level	−1.19615	0.31416	−3.808	**0.00014**
Phytotherapy	−0.39837	0.81594	−0.488	0.62539
Socio-economic level	0.41945	0.74762	0.561	0.57477

4. Discussion

The level of poor blood pressure control in this study was 46.8%. This rate could be explained by the absence of ambulatory blood pressure measurement in patients in order to eliminate a "white coat" effect. Furthermore, it is close to the data in the literature on the African environment and remains insufficient [7]-[9].

In the poor control of blood pressure in hypertensive patients in sub-Saharan Africa, several studies have incriminated therapeutic inertia, high stress levels, side effects of antihypertensive, anxiety, advanced age, self-medication and duration of the disease greater than or equal to five years [7] [10] [11]. In this study, the factor associated with poor blood pressure control was therapeutic non-compliance.

Treatment compliance is a crucial factor for blood pressure control. Several factors considered as determinants of therapeutic non-compliance have been studied in Africa. The most important factors incriminated are the level of knowledge about the disease and those related to the treatment: side effects, number of drugs in addition to antihypertensive treatment [12]. The appropriation of the treatment by the patient is an important element on which prescribers should insist, hence

the fundamental place of the diagnosis of announcement and therapeutic education. This is integrated into the framework of a global response to achieve a comfortable blood pressure control rate as achieved by some low- to middle-income countries.

5. Conclusion

This work revealed that therapeutic nonobservance was the factor associated with poor blood pressure control. It would be essential to identify the factors associated with this nonobservance, to promote therapeutic education for patients and to make care accessible.

Limitations of the Study

We were faced with the absence of certain biological tests, self-measurement and ABPM in several patients, which did not allow us to better assess the cardiovascular risk and the level of control.

Conflicts of Interest

The authors have read and approved the final version of the manuscript. The authors have no conflicts of interest to declare.

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