

# Prevalence, Characteristics and Management of Hypertension in an Outpatient Clinic at the Cardiology Department in Lome (Togo).

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## ABSTRACT

**Background:** This study was undertaken to evaluate epidemiology and management of hypertensive outpatients in the cardiology department of the Campus Teaching Hospital of Lome. **Methods:** We conducted a retrospective and descriptive study among 1100 hypertensive outpatients, carried out over a period of 5-years (January 1st, 2012 to December 31st, 2016). The data collected were epidemiological, clinical, paraclinical, therapeutic and evolutionary aspects of hypertension. **Results:** The prevalence of hypertension was 71.3 %. Sex ratio (female/male) was 1,7. Mean age was  $53.7 \pm 12.57$  years. Hypertension was stage 1 in 50.9 %, stage 2 in 40.5 % and stage 3 in 8.6 %. Overall cardiovascular risk was very high in 51.5 % and high in 30.4 %. The average vascular age was of  $73.32 \pm 10.37$  years. Antihypertensive drugs were prescribed in 99.3 %. More than 62 % were receiving at least two antihypertensive drugs. The most common antihypertensive agents used were angiotensin-converting enzyme inhibitors (54.9 %) and diuretics (47.8 %). The most common and effective agents for monotherapy were calcium antagonists. When two or more drugs were used, renin-angiotensin system blockers and diuretics or calcium antagonists were most commonly used. Renin-angiotensin system blockers and calcium antagonists were the most efficient among the polytherapy regimens. Blood pressure control was achieved in 49,8 % of cases. **Conclusion:** High blood pressure had been very frequent in our series. Overall cardiovascular risk is very high and high. Treatment required at least two antihypertensive drugs to meet the recommended blood pressure target.

**Keywords:** Hypertension, prevalence, cardiovascular risk, management, Lome.

## INTRODUCTION

Hypertension is one of the most chronic conditions that is an important worldwide public health challenge. The global prevalence of hypertension is high and was estimated to be 1.13 billion in 2015.<sup>[1,2]</sup> The overall prevalence of hypertension in adults is around 30 - 45%.<sup>[3]</sup> It has been said that this high prevalence of hypertension is consistent across the world, irrespective of income status.<sup>[2,3]</sup> In SSA, the prevalence of hypertension between 2000 and 2013 ranged from 14.7% to 69.9%. The median prevalence was 29%, and the random effects model combined prevalence was 30%.<sup>[4]</sup> In Togo, the prevalence of hypertension is 36.7 % in the general population and 74.3 % in the elderly.<sup>[5,6]</sup>

Most often, hypertension is associated with other cardiovascular risk factors making it difficult to manage. This management, combining hygiene, dietary and medical measures, has evolved in recent years. There are, however, clear discrepancies between the therapeutic possibilities and the control of blood pressure in hypertensive patients. In total, only 30 % of people with hypertension are well controlled under treatment.<sup>[7,8]</sup> The aim of this study was to evaluate the epidemiology and management of outpatient hypertension in the Cardiology Department of Campus Teaching Hospital of Lome.

## MATERIALS AND METHODS

This was a retrospective and descriptive study involving patients seen in an outpatient clinic at the Cardiology Department of Campus Teaching Hospital in Lome. Campus Teaching Hospital is the second national reference center for health in Togo. This study covered a 5-year period from January 1, 2012 to December 31, 2016. We included in the

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study, patients of both sexes aged 18 and over who were seen for hypertension with a regular follow-up at the cardiology department.

The data collected were: prevalence, age, sex, blood pressure, order cardiovascular risk factors (diabetes, dyslipidemia, smoking, obesity, high pulse pressure) and target organ damage and treatment modalities were also collected. Overall cardiovascular risk was assessed using the global cardiovascular risk assessment chart of the European Cardiology and Hypertension Societies (ESH / ESC) in 2018 [2]. Vascular age was calculated from [www.comitehta.org](http://www.comitehta.org).

Hypertension was defined by blood pressure greater than or equal to 140/90 mmHg and/or a known history of hypertension. Diabetes mellitus was defined as fasting blood glucose greater than or equal to twice 1.26 g/L and/or a known history of diabetes.<sup>[9]</sup> Dyslipidemia was defined according to the National Cholesterol Education Program (NCEP) (total cholesterol > 2.00 g/L and/or hypertriglyceridemia > 1.60g/L for men and > 1.35 g/L for women and/or Low Density Lipoprotein > 1.50 g/L, and / or High Density Lipoprotein < 0.35 g/L for men and < 0.45 g/L for women) [10]. Obesity was defined as BMI greater than 30 kg/m<sup>2</sup>. Abdominal obesity was defined according to the International Diabetes Federation (IDF) and (NCEP).<sup>[10,11]</sup> Active smoking was considered a risk factor when it was present or stopped for less than three years. Renal impairment was assessed using creatinine clearance, calculated using the Cockcroft and Gault formula. Pulse pressure > 60 mmHg was considered as a risk factor.<sup>[12]</sup> We considered hypertension control for a value of the PAS < 140 mmHg and the PAD < 90 mmHg.

Data analysis was conducted using Statistical Package for Social Sciences (SPSS) software version 22. Means and the respective standard deviations and proportions were used to describe the distribution of the data. The chi squared test was used to determine the statistical significance of the differences between the proportions and the Student t test was used to compare means. The difference was considered statistically significant for a threshold of 5 %.

The University Teaching Hospital Ethics Committee had previously approved this study protocol.

## RESULTS

A total of 1100 hypertensive patients (63.4 % women) out of 1542 patients were seen for cardiovascular diseases (prevalence of hypertension was 71.3 %). Mean age  $\pm$  standard deviation (SD) was  $53.7 \pm 12.5$  years (range: 21 to 92 years). [Figure 1] is shown the distribution of patients by age and sex. [Table 1] summarizes the general characteristics of our patients. Other cardiovascular risk factors are reported in [Table 2].

Mean blood pressure was 158/95 mmHg with an uncontrolled hypertension rate of 93.2 %. Hypertension was classified as stage 1 in 50.9 %, stage 2 in 40.5 % and stage 3 in 8.6 %. Target organ damage was cardiac (21.5 %), ocular (5.9 %), renal (4.7 %) and cerebral (1.2 %). Cardiovascular complications were left ventricular hypertrophy (63.7 %), heart failure (7.2 %), arrhythmia (5.3 %) and coronary artery disease (4.8 %). Overall Cardiovascular risk stratification of patients is reported in Table 2. Overall cardiovascular risk was very high in 51.5 %. Only 3.8 % had a low overall cardiovascular risk. The mean vascular age was  $73.3 \pm 10.3$  years; which makes an average difference of 20 years. Vascular age was greater than 80 years in 58.9 %.

More than ninety-five percent (99.3 %) of patients received antihypertensive drugs. Angiotensin Converting Enzyme (ACE) inhibitors were the most prescribed (54.9 %) followed by diuretics (47.8 %), calcium antagonists (34.5 %), beta-blockers (19.4 %) and angiotensin receptor blockers (14.1 %). Only 4.1 % were taking centrally-acting sympatholytics (CAS). More than 62 % patients were taken at least two antihypertensives. RAS blockers + diuretics was the most combination of two drugs prescribed (52.7 % fixed and 29.5 % non-fixed) [Table 3].

**Table 1: General characteristics of our patients.**

	Male n = 403	Female n = 697	Total n = 1100	p
Height (m)	1.71 $\pm$ 0.07	1.61 $\pm$ 0.06	1.64 $\pm$ 0.08	< 0.001
Weight (kg)	74.88 $\pm$ 13.49	73.42 $\pm$ 15.27	73.95 $\pm$ 14.66	0.11
BMI (kg/m <sup>2</sup> )	25.49 $\pm$ 4.08	28.17 $\pm$ 5.62	27.19 $\pm$ 5.27	< 0.001
WC (cm)	90.41 $\pm$ 11.68	93.43 $\pm$ 13.66	92.32 $\pm$ 13.03	< 0.001
SBP (mmHg)	160.22 $\pm$ 23.15	157.45 $\pm$ 22.28	158.46 $\pm$ 22.63	0.05
DBP (mmHg)	95.53 $\pm$ 12.53	94.85 $\pm$ 11.49	95.10 $\pm$ 11.88	0.36
Pulse pressure	64.94 $\pm$ 17.66	62.57 $\pm$ 17.15	63.44 $\pm$ 17.37	0.02

BMI : body mass index ; WC : waist circumference ; SBP : systolic blood pressure ; DBP : diastolic blood pressure

After one-year follow-up, mean blood pressure was 132/83 mmHg. The decrease of blood pressure was significant ( $p < 0.001$ ). The rate of controlled blood pressure was 49.8 %. The drugs used had an impact on blood pressure control. In monotherapy, calcium antagonists were the most effectives followed by beta-blockers [Figure 2]. There was a significant decrease of systolic blood pressure for calcium antagonist compared to diuretics ( $p = 0.02$ ) and diastolic blood pressure for calcium antagonists compared with diuretics ( $p = 0.05$ ) and RAS-blockers ( $p = 0.02$ ). Among the other classes of antihypertensives, there was no significant difference in the decrease of blood pressure. In combination therapy, the combination of RAS-blockers + calcium

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antagonists had more decreased systolic blood pressure ( $44.1 \pm 32.7$ ) and diastolic blood pressure

( $18.5 \pm 15.1$ ) than the combination RAS-blockers + diuretic ( $p = 0.005$ ) and ( $p = 0,01$ ).

**Table 2: Other cardiovascular risk factors and overall cardiovascular risk.**

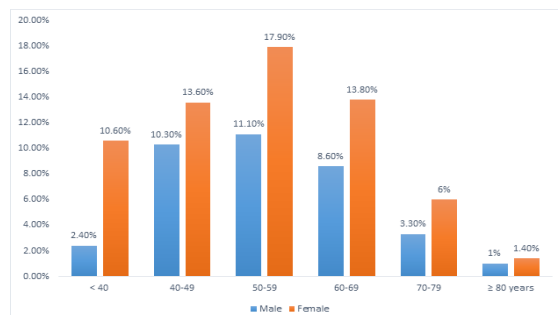
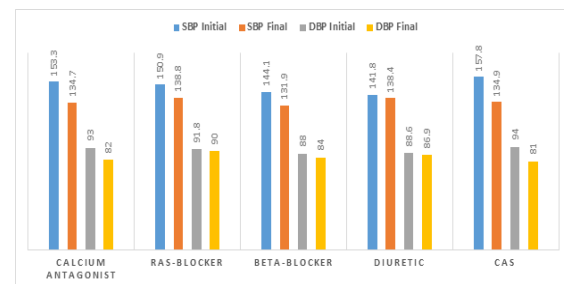
Data	Male		Female		Total		p
	n = 403	%	n = 697	%	n = 1100	%	
Tobacco	16	4	4	0.5	20	1.8	< 0.001
Family story of hypertension	41	10.2	70	10.0	111	10.1	0.51
Diabetes	35	8.7	57	8.2	92	8.4	0.42
Pulse pressure > 60	178	44.2	265	38.0	443	40.3	0.02
Obesity (BMI $\geq 30$ Kg/m <sup>2</sup> )	47	11.7	230	33.0	277	25.2	< 0.001
Abdominal obesity (IDF)	141	35.0	547	78.5	688	62.5	< 0.001
Abdominal obesity (NCEP)	61	15.1	424	60.8	485	44.1	< 0.001
High total cholesterol	198	49.1	430	61.7	628	57.1	< 0.001
High LDL cholesterol	120	29.8	333	47.8	453	41.2	< 0.001
Low HDL cholesterol	85	21.1	280	40.2	365	33.2	< 0.001
High triglycerid	73	18.1	170	24.4	243	22.1	0.02
<b>Overall cardiovascular risk</b>							
Low	13	1.2	29	2.6	42	3.8	
Moderate	45	4.1	113	10.2	158	14.3	
High	96	8.7	238	21.7	334	30.4	
Very high	249	22.6	317	28.9	566	51.5	

BMI : body mass index ; IDF : International Diabetes Federation ; NCEP : National Cholesterol Education Programme.

**Table 3: Type of drugs used.**

	Number of patients	% of patient
<b>One drug (n = 402 ; 36.5%)</b>		
Calcium antagonist	143	35,6
RAS-blocker	107	26,6
Beta-blocker	65	16,2
Diuretic	63	15,6
CAS	24	6
<b>Two drugs (n = 525 ; 47.7%)</b>		
Fixed combinaison (n=349 ; 31.7%)		
RAS-blocker + diuretic	184	52.7
RAS-blocker + calcium antagonist	98	28.1
Calcium antagonist + diuretic	48	13.8
Other	19	5.4
<b>Non-fixed combinaison (n = 176 ; 16%)</b>		
RAS-blocker + diuretic	52	29.5
RAS-blocker + calcium antagonist	45	25.6
RAS-blocker + beta-blocker	23	13.1
Calcium antagonist + diuretic	15	8.5
Other	41	23.3
<b>Three drugs (n = 149 ; 13.6%)</b>		
Fixed combinaison (n = 4 ; 0.4%)		
RAS-blocker + diuretic + calcium antagonist	4	100
Non fixed combinaison (n = 145 ; 13.2%)		
RAS-blocker + diuretic + calcium antagonist	36	24.8
RAS-blocker + 2 diuretics	28	19.3
RAS + beta-blocker + diuretic	23	15.9
Other	58	40
<b>Four drugs (n = 16 ; 1.5%)</b>		
RAS-blocker + calcium antagonist + beta-blocker + diuretic	4	25
RAS-blocker + calcium antagonist + 2 diuretics	3	18.8
Other	9	56.2

CAS : centrally-acting sympatholytic ; RAS : renin-angiotensin system

**Figure 1: Distribution of patients by age and sex.****Figure 2: Change in blood pressure according to drugs used.**

## DISCUSSION

This study was a tool for estimating the prevalence and characteristics of hypertension in the outpatient clinic unit of Cardiology department of Campus Teaching Hospital of Lome. The observed prevalence of hypertension was similar to what has been found in elder population in Lome.<sup>[4]</sup> In our study, hypertension stage 2 and 3 was observed in 49.1 % of patients. This shows the severity of hypertension of our patients. Previous studies showed that Black Africans present with more severe forms of arterial hypertension and a greater risk of target organ damage.<sup>[13,14]</sup> High prevalence of dyslipidemia, obesity and diabetes was found, and heart involvement was the most common end-organ damage, especially left ventricular hypertrophy (63.7 %). The stage of hypertension and high prevalence of other cardiovascular risk factors contributed to the important rates of very high or high added cardiovascular risk that we observed. Our patients generally have a higher cardiovascular risk than those in Western countries.<sup>[15,16]</sup> The vascular age of hypertensive patients is greater than their real age, greatly increasing the risk of occurrence of cardiovascular disease. Screening and early management of cardiovascular risk factors therefore appear to be essential.

The main benefits of antihypertensive treatment are blood pressure lowering and all the 5 main antihypertensive classes can adequately lower blood pressure.<sup>[8]</sup> In our series, 99.3 % of patients had been on antihypertensive drugs. The most prescribed drugs were ACE inhibitors followed by diuretics and calcium antagonists (34.5 %) as in other studies.<sup>[14,17,18]</sup> In monotherapy, calcium antagonists (35.6 %) and RAS-blockers (26.6 %) were the most prescribed as in the Kramoh's study.<sup>[14]</sup> However, the European cardiology and hypertension societies and the Joint National Committee VIII recommend calcium antagonists and diuretics initially as monotherapy in black subjects.<sup>[8,19]</sup> The very high risk and the high proportion of hypertensive complications in our series could explain that calcium antagonists and RAS-blockers prescription as monotherapy. These drugs have been effective in protection of the target organs.<sup>[20-23]</sup>

More than 62 % of our patients took at least two antihypertensive. It is knowing that more than 2/3 of hypertensive patients are not controlled with monotherapy.<sup>[14,19]</sup> The ESC and ESH, in their new guideline, recommend that most patients should take two antihypertensive drugs at the start of pharmacotherapy, preferably combined in a single tablet.<sup>[2]</sup> Antihypertensive drugs must be combined according to different and complementary mechanisms of action and take into account a reduction side effects.<sup>[8,12,24]</sup> At last visit, the rate of blood pressure control was 49.8 % in our series. This rate of blood pressure control approximates some

values found in Côte d'Ivoire<sup>14</sup> and in Western regions: 31-52 % in Europe and 63 % in the United States.<sup>[25,26]</sup> At the same time, some African studies show a lower rate of blood pressure control: 11.4% to 29 %.<sup>[13,27]</sup> But in these Africa countries, the study was not made in the cardiology department.

The goal of hypertension management is to maintain blood pressure below 140/90 mmHg and to correct other modifiable cardiovascular risk factors to reduce long-term morbidity and cardiovascular mortality.<sup>[8]</sup> In our series, the final systolic and diastolic blood pressure averages were  $132.7 \pm 19.9$  and  $83.6 \pm 9.3$ , respectively, and there was a significant decrease in systolic blood pressure ( $p < 0.001$ ). We also noted an increase in patients with low and moderate added cardiovascular risk and a reduction of patients with high and very high added cardiovascular risk during follow-up. In monotherapy, calcium antagonists had the greatest lower in blood pressure as found in Côte d'Ivoire and Nigeria.<sup>[14,28]</sup> This reinforces the recommendations regarding the place of calcium antagonists and diuretics as monotherapy in black subjects.<sup>[28]</sup> In combination therapy, combination of RAS-blockers + calcium antagonists had the greatest decrease in systolic ( $p = 0.005$ ) and diastolic ( $p = 0.01$ ) blood pressure compared with the combination of RAS-blocker + diuretics. In the Kramoh's series, the combination of RAS-blockers + diuretics was the most effective ( $p < 0.01$ ).<sup>[14]</sup>

## CONCLUSION

High blood pressure had been very frequent in our series. Overall cardiovascular risk is very high and high. The most common antihypertensive agents used were angiotensin-converting enzyme inhibitors, diuretics and calcium antagonists. Treatment required at least two antihypertensive drugs to meet the recommended blood pressure target.

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