



Epidemiological Study of High Blood Pressure in Haut-Ogooue Province, Franceville, Gabon

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ABSTRACT

Introduction: Hypertension is now a major public health problem in sub-Saharan Africa. Non communicable diseases take precedence over infectious or parasitic diseases, which are the most frequent in the region.

Materials and Methods. An epidemiological study retrospective and prospective from october 2013 to october 2015 on high blood pressure was carried out in the Haut-Ogooue province (Gabon), specifically in two main centers: International Center for Medical Research of Franceville and Amissa Bongo Hospital Center. Inclusion criteria were for hypertensive patients with systolic blood pressure (SBP > 140 mm Hg) and / or diastolic (DBP > 90 mm Hg). Demographic parameters and socio-occupational criteria were recorded for each patient.

Result: The results showed that the prevalence was 13.48%. There was no significant difference between the genus ($p = 0.37$ and odds ratio = 0.88). The most affected age group is [41-60].

Overweight hypertensive patients represented 46.30% of patients compared with 3.76% for normotensive patients. These data confirm the risky character of high blood pressure for cardiovascular disease. In terms of socio-occupational criteria, the most vulnerable are workers, farmers, housekeepers and the unemployed, ie 45% of the patients ($p = 0.000$ and odds ratio = 0.22).

Conclusion: There seems to be an association between high blood pressure and work activities. Smoking and alcoholism have not been identified as a risk factor, but this link has already been demonstrated in several studies.

Keywords: Hypertension, Epidemiological study, Haut-Ogooue, Franceville, Prevalence.

Introduction

High blood pressure is defined by the WHO as a systolic blood pressure (SBP) of 140 mm Hg and/or diastolic blood pressure (DBP) of 90 mm Hg^[1]. Hypertension is a common, important and major public health problem^[2]. Its prevalence was found at 44% in Western Europe and 28% in North America. It has been established as a threat to human health in sub-Saharan Africa and a major contributor to morbidity and mortality in the subregion^{[3],[4]}. There is emerging evidence to show that the disease model in sub-Saharan Africa is changing, with noncommunicable diseases (NCDs) responsible for about 22% of total deaths in the region in 2000, cardiovascular disease alone account for 9.2% of total mortality^[5]. According to Kearney and collaborators, in 2025 about 75% of the hypertensive population will be in developing countries^[6]. In Africa, hypertension is generally more pronounced in men than in women. However, in a number of countries, the prevalence rate was higher among women than among men in Algeria, 31.6% compared to 25.7% in 2003; In Botswana, 37% compared with 28.8% in 2006 and 25.8% in Mali compared to 16.6% in 2007. In addition to the difference in prevalence between the sexes, there is also the place of residence. In countries where the World Health Survey data are available, the urban population has a higher prevalence of hypertension than the rural population^[7]. In Gabon, the prevalence of arterial hypertension is between 20 and 35%^[8]. The management of black hypertensive patients has been the subject of specific recommendations for low-income countries^[9]. In practice, limited efforts focus on screening and treating patients at higher risk (severe hypertension or secondary prevention)^[10]. The aim of this study is to determine the prevalence of hypertension and the associated factors in two institutions, which have a high frequency of patients: Amissa Bongo de Franceville Regional Hospital Centers (CHRAF) and the International Center for Medical Research of Franceville (CIRMF).

Materials and Methods

Ethical considerations

This study was reviewed and approved by National Committee on Ethics for Research (CNER) of Gabon. Participants were informed that participation is completely voluntary, and written consent was obtained from each participant before being subjected to the questionnaire and after discussing the objective with the participants. No names were recorded on the questionnaires. Adequate training of data collectors took place to ensure protection of confidentiality, and all questionnaires were kept safe.

Place and study population

The study was retrospective and prospective from October 2013 to October 2015 and was conducted at the Observatory of the Medical Research and Analysis Unit (URAM) at International Center for Medical Research of Franceville (CIRMF) and the Amissa Bongo Regional Hospital Center in Department of Medicine General.

Inclusion and Exclusion Criteria

Patients enrolled in the study were those who were consulted at the Medical Analysis Research Unit, who had an application or had a blood pressure test, and those who were confirmed during the hypertensive diagnosis by measure (SBP > 140 mm Hg) and / or diastolic (DBP > 90 mm Hg) were repeatedly included in the study.

All patients received in the Medical Analysis Research Unit (URAM) and hospital centers with hypotension or normal tension (less than or equal to 140/90mmHg) were excluded from the study.

Statistical analysis: The data collected was entered on an Excel file (Microsoft Office 2007) and then imported on Epi-Info 6 (version 3.5.1) for statistical analysis. The data were divided into qualitative and quantitative variables: The results of the qualitative (nominal) variables are given in numbers (n) and percentages (%); As for the quantitative variables, the averages were calculated; Statistical significance thresholds were considered for $p < 0.05$.

Results

Of 2104 patients registered at International Center for Medical Research at URAM and Amissa Bongo Regional Hospital Center, 284 were in hypertension, a prevalence of 13.48%.

The study population consisted of 1078 men, 51.24% and 1026 women, 48.76%. The 21-40 age bracket was the largest. This population was predominantly individuals with normal BMI (75.66%) (Table 1).

Table 1: General characteristics of the selected population

Variables		Blood pressure measurements	
		n=2104	%
Sex	Men	1078	51.24
	Women	1026	48.76
Age groups (years)	≤20	375	17.82
	21-40	876	41.63
	41-60	588	27.94
	≥60	265	12.61
Body mass index (BMI)	Thinness	76	3.61
	Normal	1592	75.66
	Overweight	311	14.78
	Obesity 1	112	5.32
	Obesity 2	13	0.63
	Obesity 3	0	0

Table 1 shows the characteristics of the study population. This population is composed of men and women aged less than 20 years to more than 60 years. All classes of BMI are represented except the Class 3 obesity.

Of 284 hypertensive patients, 146 were women, or 14.23% of the total study population. The mean age was 40 years [range 21-60 years]. There was no statistical difference in the proportions of hypertensive cases of different sexes (p = 0.37 and odds ratio = 0.88) (Table 2). Class 1 and 2 obese hypertensive subjects accounted for 57.14% and 76.92%, respectively (Table 2).

Table 2: prevalence of hypertension by different factors

Factors		n=2104	Hypertension	%	P-value	Odds ratio
Sex	Men	1078	138	12.80	0.37	0.88
	Women	1026	146	14.23		
Age groups (years)	≤20	375	7	1.86	0.000	0.27
	21-40	876	73	8.33		
	41-60	588	147	25		
	≥60	265	57	21.50		
Body mass index (BMI)	Thinness	76	7	9.21	0.000	0.05
	Normal	1592	60	3.76		
	Overweight	311	144	46.30		
	Obesity 1	112	64	57.14		
	Obesity 2	13	10	76.92		
	Obesity 3	0	0	0		

Table 2 shows the prevalence of hypertension one the general population according to different factors: gender, age group, body mass index. P-values are determined to indicate the significance (p<0.05). This table shows that the difference in prevalence according to sex is not significant (p = 0.34). The significance was observed in the other two cases.

Of 284 hypertensive patients, 146 were female, and 138 were male with a sex ratio of 0.94. The most affected age group was 41 to 60 years (p = 0.000 and odds ratio = 0.27). This distribution is shown in Table 3.

Table 3 : Distribution of hypertensive by age and sex

Age group (years)	≤ 20	21 - 40	41 - 60	>61	Total
Men	4	33	79	22	138
Women	3	40	68	35	146
Total	7	73	147	57	284
Percentage (%)	2.46	25.70	51.76	20.07	100

Table 3 shows the percentages by age group, number of men and number of women in the 284 hypertensive. The age group 41-61 years is the most representative (51.76%).

144 of 284 hypertensive patients are overweight or 46.30%. The overall prevalence of overweight and obese hypertensives is 50%. Statistical analyzes show that hypertension affects overweight (46.30%) or obese (57.14%) compared to normal subjects (3.76%) (p = 0.000 and odds ratio = 0.05). This data confirms that obesity is a major risk factor for cardiovascular disease for hypertensive patients (Fig. 1).

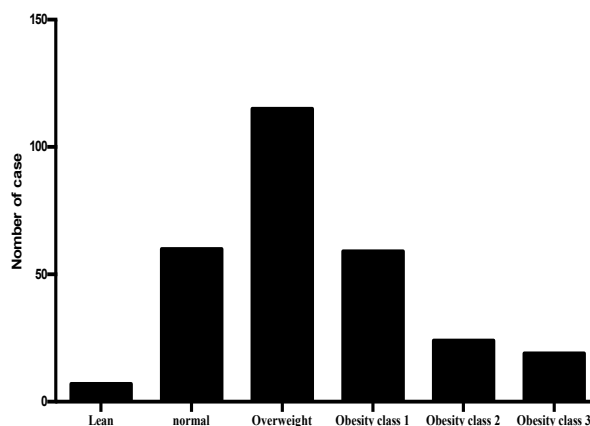


Fig. 1 : Distribution of Hypertensive by Body Mass Index

Figure 1 shows the distribution of hypertensive BMIs, the overweight individuals are the most victims. The meager are more or less spared.

Among the 284 hypertensive patients, the most affected are grouped in category 4 with 45%, ie workers, farmer, women in the household, and the unemployed ($p = 0.000$ and odds ratio = 0.22) (Table 4).

Table 4: Profile of the hypertensive patients by social status of $n= 284$

Categories	1	2	3	4	P-value	Odds-ratio
Number of hypertensive patients	35	66	55	128	0.000	0.22
Percentage (%)	12.3	23.2	19.3	45		

Table 4 shows the percentages of hypertensive patients according to the socio-professional categories divided into four categories: Category 1 represents the wealthy social classes, wealthy traders, senior managers and businessmen; Category 2: represents traders and owners of medium-sized enterprises, master level cadres; Category 3: Small shops, small businesses, lower management and Category 4: Workers, farmers, women in the household, unemployed is the most affected (45%).

Discussion

The overall prevalence of hypertension in this study is estimated at 13.48%. This prevalence is not far from that found in Algeria (15%)^[11]. Other previous studies indicate a prevalence of 14% in Benin, 10% in Mali, 14% in Côte d'Ivoire, 13% in Ghana, 6% in Nigeria, 9% in South Africa^[13]. However, this value is less than that found in a study by the National Program for Control of Non-Communicable Diseases (NPCNCD) in Kango in 2013, which was 27.60%^[21]. Another study carried out in 1985 Found that the prevalence of hypertension in Gabon was 35%^[14]. Most of these data are now obsolete given that 20 years ago the definition of hypertension was from 160/95 mm Hg. The latest guidelines of the three major associations (Joint National Committee, JNC7, European Society of Hypertension European Society of Cardiology, ESH / ESC, World Health Organization/ International Society of Hypertension,

WHO/ ISH) lowered this figure to 140/90 and lower for diabetics and insufficient renal patients with thresholds of 130/85 mm Hg^[13].

The analysis of the distribution of patients according to sex firstly shows that the disease invariably affects men and women with a sex ratio of 0.94 (138/146). In contrast to a parallel diabetes study, a significant difference was not observed between men and women due to disease ($p = 0.37$ and odds ratio = 0.88). These results are similar to a result that was obtained on a Congolese population^[15].

In addition, a study conducted in Mali in 2009 concluded that women were more affected by HT than men with 56.3% vs 43.7%^[11]. This predisposition of urban women to be more vulnerable to hypertension compared to men appears to be related to a number of factors: the use of hormone contraceptives heavily dosed with estrogens; acquired and physiological obesity of women; the abuse of anorexigenic and non-steroidal anti-inflammatory drugs^[11]. In this study, the mean age was 40 years [range 15-60 years]; There is a steady increase in the overall frequency of hypertension to the highest rate of 25% in the 41 to 60 age bracket (Table 2). Several studies show that the onset of hypertension increases with age with a peak around 50 years^{[13], [15], [17]}.

Analysis of the distribution according to body mass index (BMI) shows that the overall prevalence of overweight and obese hypertensive patients is 46.30% and 57.14%, respectively, compared to normal persons (3.76 %) ($p = 0.000$ and odds ratio = 0.05). Obesity is a major risk factor for hypertension, as that has been demonstrated in several studies^[19-20]. It should be noted that simple excess weight alone does not explain the relationship between body weight and hypertension. The distribution of fat plays a role and there is an association between the waist/ hip ratio and blood pressure. Abdominal-type obesity has a stronger link with hypertension, increasing the risk of stroke by 2.3 and increasing the risk of death.

As in the case of diabetes^[22], the study of social and occupational factors shows that the most vulnerable

people are those belonging to low socio-economic groups that is to say, the workers, farmer, women household and unemployed category 4, with 45% against 12.3% of about affluent social layers, rich traders, executives, businessmen ($p = 0.000$ and odds ratio = 0.22). This distribution is similar to that observed with the diabetes study. A study carried out in Mali in 2009 shows that there is a correlation between hypertension and occupational activity, the least affected by hypertension being clerical workers, ie the subjects of well-off social classes with 29.6% against 48.5% of the informal sector or those of the weak socio-economic groups^[18]. With respect to tobacco and alcohol, hypertension study did not identify these factors as aggravating risk factors. However, several studies show that alcoholism and smoking are risk factors for hypertension. Notably the studies carried out in Mali^[11] and Lower Guinea^[13]. There is a positive association between alcohol use and hypertension. In hypertensive patients, as in normotensive patients, reduction or cessation of alcohol consumption is associated with a reduction in blood pressure^[12]. Cigarette smokers have higher blood pressure than non-smokers. Their blood pressure is all the higher because they belong to families of hypertensive patients^[12].

Conclusions

The overall prevalence of hypertension is estimated at 13.48%. This prevalence may appear to be low because it is an asymptomatic disease and the majority of the remote populations in rural areas do not have access to one of the nearby medical centers that would enable them to screen for Diagnose the disease. However, due to the resurgence of these diseases, which are both silent and non-transmissible, observatories are installed within hospitals with specialized medical personnel to detect cases of hypertension for patients presenting for pathologies variety. The results show that there is no significant difference between men and women in the face of the disease. On the distribution of body mass index (BMI), overweight and obese patients are more affected, with a much

more pronounced tendency in women. This should foster a public health policy oriented towards young girls in school in order to monitor the evolution of the disease during the journey up to the age of procreation. Finally, it is clearly established that people who are economically weak or who live in precarious situations are more victims of this pathology. Indeed, a large majority of this segment of the population is affected by hypertension as opposed to well-off people. Several reasons still to be elucidated could explain this situation, which directly links hypertension to precariousness. There is a national program for the control of noncommunicable diseases in Gabon, but its effectiveness has not yet been demonstrated in the face of the seriousness of this disease. Similarly, the poverty reduction strategy in Gabon will be necessary to reduce the impact of these diseases in this segment of the population.

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Conflict of interests

The authors declare no potential conflict of interests.

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