Epidemio-clinical profile of hypertension among patients at the Sino-Gabonese Friendship Hospital in Franceville (SGFHF), Central Africa.

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ABSTRACT

Background: A major public health problem in most countries of the world, hypertension remains a hidden killer. This study determines the epidemio-clinical profile of hypertension, among patients at the Sino-Gabonese Friendship Hospital in Franceville, Central Africa.

Patents and method: This is a prospective, cross-sectional study, conducted from August 1 to October 11, 2023. The study data are the results of blood pressure measurements using a tensiometer and responses to a structured questionnaire sent to consenting patients in the general medicine department of the Sino-Gabonese Friendship Hospital in Franceville. Hypertension was defined for any patient with systolic blood pressure $\geq$ 140 mmHg or diastolic blood pressure $\geq$ 90 mmHg. The study population consisted of patients aged 16 and over, living in and around Franceville, South East Gabon. Data were entered into a Microsoft Excel 2013 spreadsheet and exported to R software version 4.0.3. To identify sociodemographic and anthropometric characteristics independently associated with hypertension, odds ratios were calculated within a 95% confidence interval, and results were considered significant at p$\leq$ 0.05.

Results: A total of 120 individuals answered the questionnaire correctly, and participated in this study. With a mean age of 43.23 $\pm$ 15.2 years, women outnumbered men, indicating a sex ratio (F/H) of 0.67. In the present study, the prevalence of hypertension was 35% (95% CI: [0.27- 0.44]), (n=42), compared with 65% (n=78) who were negative. Univariate analysis of this prevalence according to the sociodemographic and anthropometric characteristics of study patients, indicated that being between 60 - 69 years of age (Odds Ratio = 0.14; 95% CI [1.23-15.44], p=0.015*), not active (Odds Ratio = 7.65; 95% CI [3.27-17.95] p$\leq$ 0. 000*), being

overweight (Odds Ratio = 3.38; 95% CI [1.41 - 8.11] p=0.005*), or obese (Odds Ratio = 4.35; 95% CI [1.29 ;13] p=0.011), was significantly associated with the prevalence of hypertension.

Conclusion : These results, which suggest the emergence of hypertension in the study population, may raise awareness of the health habits of the population of Franceville, in south-eastern Gabon.

Key words: Prevalence; Hypertension, Obesity, Franceville Gabon.

INTRODUCTION

Background

In most developing countries, hypertension is a growing public health problem [1]. Also known as the "silent killer", this disease presents no particular signs or symptoms [2]. The only way to control the prevalence of hypertension remains its knowledge, practices, awareness and people's attitude towards this burden, which can play a key role in improving cardiovascular disease prevention [3]. Manifested by high blood pressure and blood pressure, hypertension puts more work on the heart [4]. It is a serious pathological condition that leads to risks of heart, brain, kidney and other diseases [5]. This disease is truly a "silent killer", as in its initial stages it presents no specific signs or symptoms. Nevertheless, dietary and lifestyle modifications, management and hypertension awareness can be effective means of controlling hypertension. This is why it has become the world's most preventable disease [6]. In fact, health promotion and disease prevention are most often based on the individual, followed by the community and the organization. Lifestyle change is therefore very important for the prevention and management of hypertension in populations [7]. Although a great deal of research has been carried out in this field, certain gaps remain, particularly in low- and middle-income countries, such as lack of awareness among the general population and lack of access to the implementation of hypertension prevention measures [8]. Worldwide, an estimated 1.28 billion adults aged 30 to 79 suffer from hypertension, most of whom (two-thirds) live in low- and middle-income countries. [9].

Located in equatorial Africa, Gabon is no exception to the ravages of cardiovascular disease (CVD), particularly hypertension. Numerous studies have been carried out on the prevalence of hypertension in other regions. For example, the study carried out in the workplace, which showed a prevalence of 37.0% [10], or the study carried out on the complications of hypertension [11]. However, there is a lack of studies providing more recent information on arterial hypertension directly linked to cardiovascular disease. It is in this context that this study

was undertaken, to determine the epidemio-clinical profile of hypertension among patients of the Sino-Gabonese Friendship Hospital in Franceville, Central Africa.

II. PATIENTS AND METHODS

II.1 Study design

This is a prospective, cross-sectional, descriptive study, based on a structured questionnaire, conducted from August 1st to October 2023. A systematic random sampling method was used to select study subjects.

II.2 Study setting

The study was conducted at the medical analysis laboratory of the Sino-Gabonese Friendship Hospital in Franceville. Located in the second arrondissement of Franceville, this public health facility supports the Franceville University Hospital. It has an adequate and modern technical platform to receive people from all walks of life.

II.3. Study population

The study population consisted of people of both genders, aged 16 and over.

II.3.1. Inclusion criteria

All persons aged 16 and over, who had consented to participate in the study and who had completed the pre-tested questionnaire according to the modified WHO STEPS protocol [12].

II.3.2. Exclusion criteria

People under 16 years of age, people with physical deformities, pregnant women and people with other chronic diseases were excluded from the study.

II.4 Data collection method

II.4.1. Questionnaire

 This was used to record socio-demographic characteristics such as age, gender, marital status, residence and professional status.

II.4.2. Measurement and diagnosis of hypertension

II.4.2.1. Instruments used

II.4.2.1.1. Tensiometer

This was used to measure blood pressure, which was regularly checked against a similar instrument and regularly standardized throughout the study.

II.4.2.1.2 Bathroom scales

Weight was taken on a portable scale with a calibrated 0.5 kg scale marked 0-13 kg, and the device was frequently checked against standard weights.

Waist circumference was measured for each participant in the standing position, using a calibrated tape measure marked in centimetres.

NB: Experimental measurements, including height, weight and blood pressure, were observed using standard protocols and instruments. Blood pressure was measured using a digital measuring device, with participants seated after resting for at least 5 minutes. Each measurement was recorded three times.

Hypertensive subjects were defined as those with systolic blood pressure (SBP) equal to or greater than 140 mm Hg or blood pressure equal to or less than 90 mm Hg.or those being treated for hypertension [13].

Body mass index (BMI) was calculated using the formula weight (kg)/height (m)2, and was considered normal for a value between 18.5 and 24.9 kg/m². The individual was lean for a BMI < 18.5 kg/m²; overweight, if BMI varied between 25 and 29.9 kg/m² and obese if BMI ≥ 30 kg/m² [14].

II.5. Ethical considerations

Each subject selected received explanations of the study procedure and objectives. Subjects participated in the study on a voluntary basis. Approval to conduct the study was obtained from the Gabon South-East Regional Health Department, in Franceville, by letter No. 0365/PHO/SG/DRSSE/SGP/D, and endorsed by the hospital administration management

II.6. Statistical analysis

Data were entered and analyzed using R software version 3.6.1. Descriptive statistics were used, and comparisons between qualitative data were made using chi-square tests to assess significance. A p-value less than or equal to 0.05 was considered statistically significant

III. RESULTS

III.1 Prevalence of hypertension among study participants. (N=120)

After examination of the data, a total of 120 individuals correctly answered the questionnaire and participated in the study. With a mean age of 43.23 ± 15.2 years, women outnumbered men,

indicating a sex ratio (M/F) of 0.67. In the present study, the prevalence of hypertension was 35% (95% CI: [0.27- 0.44]), (n=42), compared with 65% (n=78) who were negative.

III.2 Prevalence of hypertension according to sociodemographic and anthropometric characteristics of study participants (N=120)

Univariate analysis of the prevalence of hypertension, according to the sociodemographic and anthropometric characteristics of study patients, indicated that being between 60 - 69 years of age (Odds Ratio = 0.14; 95% CI [1.23-15.44], p=0.015**), not active (Odds Ratio = 7.65; 95% CI [3.27-17.95] p≤ 0.000*), being overweight (Odds Ratio = 3.38; 95% CI [1.41 - 8.11] p=0.005*), or obese (Odds Ratio = 4.35; 95% CI [1.29 ;13] p=0.011*), was significantly associated with the prevalence of hypertension. Table 1.

Table1 : Univariate analysis of hypertension prevalence according to sociodemographic and anthropometric characteristics of study participants (n=120).

Variables	Study participants total numbers N (%)	Prevalence of hypertension		Univariate analysis	
		Positive N (%)	Negative N (%)	Crude Odds ratio 95% CI	p
Gender					
Male	48 (40)	15 (31.25)	33 (68.75)	0.76 [0.35 -1.65]	0.48
Female	72 (60)	27 (37.5)	45 (62.5)	Reference	
Age groups (years)					
16 - 26	17 (14.17)	7 (41.18)	10 (58.82)	1.36 [0.48-3.88]	0.56
27 - 37	22 (18.33)	6 (26.36)	16 (63.64)	0.65 [0.23-1.81]	0.40
38 - 48	26 (21.67)	12 (46.15)	14 (53.85)	1.83 [0.76-4.43]	0.18
49 - 59	29 (24.17)	12 (41.38)	17 (58.62)	1,44 [0.61-3.4]	0.41
60 - 69	23 (19.17)	2 (8.70)	21 (93.3)	0,14 [0.03-0.63]	**0.003***
≥ 70	3 (2.49)	3 (100)	0 (0)	Reference	-

Marital status					
Married	26 (21.67)	11 (42.31)	15 (57.69)	Reference	
Single	94 (78.33)	31 (32.98)	63 (67.02)	0,67 [0.28–1.63]	0.38
Professional status					
Employed	68 (56.67)	11(16.18)	57 (82.83)	Reference	
Not active	52 (43.33)	31 (35.49)	21 (67.74)	7.65 [3.27–17.95]	≤ **0.000***
Residence					
Franceville	90 (13.19)	30 (27.38)	60 (72.62)	Reference	
Other	30 (43.95)	12 (45)	18 (55)	1,33 [0.57–3.12]	0.51
BMI (Body Mass Index)					
Normal (BMI between 18.5 and 24.9 kg/m².)	65 (54.17)	13 (20)	52 (80)	Reference	
Lean (BMI < 18.5 kg/m²)	15 (12.5)	5 (33.33.)	10 (66.67)	0.92 [0.29 –2.89]	0.088
Overweight (BMI between 25 and 29.9 kg/m²)	28 (23.33)	16 (57.14)	12 (42,86)	3,38 [1,41 – 8,11]	**0.005***
Obese (BMI ≥ 30 kg/m².)	12 (10)	8 (31.5)	4 (68.5)	4,35 [1.23–15.44]	**0.015***

OR = odds ratio; CI= confidence interval; * = significant test

IV. DISCUSSION

Taking precedence over infectious diseases, non-communicable diseases, such as hypertension, constitute a real public health problem, contributing to the increasing number of premature deaths worldwide, and in Gabon in particular. To design, plan and evaluate appropriate

intervention strategies against this disease, it is very important to know his epidemiology, transmission, distribution and extent, as well as the associated risk factors in populations [15]. In this context, the aim of the present study was to determine the epidemio-clinical profile of hypertension, among patients of the Sino-Gabonese Friendship Hospital in Franceville, South East Gabon. The study showed that women outnumbered men in participation. This result corroborates that reported in studies elsewhere, in which there was a strong female representation for the diagnosis of hypertension [16]. This result may simply be due to the fact that, throughout their lives, women undergo greater hormonal fluctuations and body changes, due to reproductive factors than men, and therefore willing to know their health status [17]. Higher than the 18.92% found in the population of the Southern Ethiopian town of Arba Minch [18], and lower than the 71% found in rural residents communities in South Africa [8], the present study indicated a prevalence of hypertension of 35% (95% CI: [0.27- 0.44]). The variability of these results could be explained by the difference in participant sampling rates used in each study, the difference in study periods, regions and years [19]. The trend in the result of the present study is not surprising, given not only the unbridled urbanization of cities, unhealthy lifestyles and eating habits, but also their adverse effects on the health of the Gabonese population [20]. Furthermore, limited health services due to insufficient funds, poor infrastructure, lack of equipment and medical illiteracy, would be major obstacles to the prevention and control of hypertension [8]. Similarly, Gabon being a middle-income country, the results of the present study corroborate the view that, there is an epidemiological transition of non-communicable diseases to low- and middle-income countries, including in their rural population [21]. A univariate analysis of the prevalence of hypertension according to the socio-demographic and anthropometric characteristics of the study participants, indicated that being between 60 - 69 years of age was found to be a significant risk factor for this disease among the study participants. Similar results have been reported in studies elsewhere, suggesting that as age advances, the prevalence of hypertension in both sexes increases. Similar results have been reported by other studies, in which advancing age was positively related to hypertension [22,23]. This may be justified by the fact that in the elderly, the walls of the aorta and arteries become stiff, favoring a high susceptibility to this disease [24]. In contrast to a study that showed an association between occupational activity and hypertension [25], the present study revealed that being unemployed was significantly associated with high blood pressure. This result is in line with a study in which it was revealed that unemployed/retired respondents were significantly older than those who were working, and had a higher prevalence of hypertension [26]. Similar to a study conducted elsewhere [27], the present study indicated that being

overweight or obese was significantly associated with high blood pressure. This may be justified by the fact that sleep-disordered breathing and sleep apnea are also extremely common in obese patients [28]. However, sleep apnea is a known cause of hypertension through neurohormonal dysregulation, endothelial dysfunction, inflammation and increased endothelin levels due to repeated episodes of hypoxia [29].

Study limitations.

Despite the contributions made, the present study nevertheless has a number of limitations that deserve to be highlighted, so that they can be taken into account in future studies. Within the conceptual framework of the study, which lasted only two months, we identified a number of upstream factors (participants' life context and socio-demographic characteristics likely to influence hypertension. Firstly, the data collected for this study are responses to a questionnaire, limited solely to sociodemographic and anthropometric characteristics. Risk factors such as diet, physical activity, family history of hypertension or type 2 diabetes, were not included. However, a multivariate analysis using binary logistic regression of the prevalence of hypertension as a function of these variables would have been appropriate to better appreciate the extent of the disease. Furthermore, as this was a cross-sectional hospital-based survey, we were only able to observe the prevalence, awareness, treatment and control of hypertension in the population at the time of the study. These results cannot therefore be generalized to the entire population of Franceville, or indeed of Gabon as a whole.

CONCLUSION

Providing key information, the results of this study showed that the prevalence of hypertension in study patients was clearly associated with sociodemographic and anthrometric variables of study patients, such as; being between 60 - 69 years old, inactive, overweight, or obese. These results could guide Gabon's health authorities in the control and prevention of hypertension.

Competing interests

The authors declare no competing interests in the publication of this article.

Authors' contributions

TNM, HMK, PM, and LCOE designed and initiated the study. GMA and PM wrote the manuscript. PM and TNM performed the statistical analysis. CSO, JPO, and TNM made major contributions to the study design and statistical analysis. All authors contributed to the drafting of the manuscript and approved the submitted version of the manuscript.

Data Availability

In order to preserve the confidentiality of the participants, the data generated and analyzed during this study may be available from the corresponding author upon reasonable request.

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