

Frequency and Correlates of Obesity or Overweight Among Patients with Hypertension at the Ignace Deen National Hospital in Conakry, Guinea

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Abstract: Hypertension and obesity are common life style diseases with increasing burden in worldwide. The objective of this study was to describe the frequency and identify factors associated with obesity or overweight among patients with hypertension seeking care at the department of cardiology of Ignace Deen national hospital in Conakry, Guinea. This was a periodic cross-sectional study from May 1 to July 31, 2017. The majority of the patients was obese (36.22%) or over weighted (33.86%). The multiple logistic regression showed that sex and education level of patients were independently associated with obesity or overweight. Female patients were two times more likely to be obese or over weighted than male patients [Adjusted Odd Ratio (AOR): 2.14; 95% confidence interval (C.I): 1. 1.36-3.36]. Patients with at least primary school level were 47% less likely to be obese or over weighted than patients who had not attended school (AOR: 0.53; 95%C.I: 0.35-0.82). Even though this was not statistically significant, patients who were following a diet recommended by a care provider 43% less likely to be obese or over weighted. Particular medical follow up on and regular counseling about life style for female patients living with hypertension would be relevant during clinical practices.

Keywords: Hypertension, Obesity, Overweight, Nutrition, Guinea

1. Introduction

Hypertension and obesity are common life style diseases with increasing burden in worldwide. In 2015, 1.13 billion of people had raised blood pressure in the world [1]. Hypertension is known to be the main disease associated with obesity [2]. Recommendations for prevention and management of both diseases are mainly based on changes in lifestyle and diet [3]. Population-based studies have shown that eating fruits, vegetables and dairy products on a regular basis has beneficial effects on blood pressure [4–6]. There is

also a significant correlation between the increase in milk and milk product consumption and the significant decrease in blood pressure and coronary heart disease [7–9]. Various factors have been evidenced as risk factors of obesity; they include sedentary lifestyles, micronutrient-poor foods, fast food outlets, sugar-sweetened soft drinks and fruit juice [10]. With the emerging infectious diseases drawing much attention of governments and their partners in sub-Saharan Africa, obesity and overweight seem to be neglected public health problems [2]. Yet, obesity is associated with increasing risk of disability, illness, and death [11].

Combination of hypertension and obesity is therefore more likely to increase morbidity complications and deaths, thereby contribute to impeding socio-economic progress in the society.

In Guinea, the prevalence of hypertension was estimated to 30.3% in 2015 [1]. Another survey in 2013 in the Lower Guinea region showed that 34% and 24% of the population aged 15 to 64 had high blood pressure in urban and rural areas, respectively; the same study reported a prevalence of 25% in Conakry [12]. The prevalence of obesity has been estimated to 5.9% in 2014 [13]. However, this indicator might be much higher among people living with hypertension. In the Guinean context, little is known on the association between hypertension and obesity. This study is the first of its kind to examine the burden and factors associated with excessive overweight among patients with hypertension in Guinea. It will provide baseline indicators to guide policies and clinical practices and advocate for more attention to control non communicable diseases in Guinea.

The objective of this study was to describe the frequency and identify factors associated with obesity or overweight among patients with hypertension seeking care at the department of cardiology of Ignace Deen national hospital in Conakry, Guinea.

2. Methods

2.1. Study Design and Population

We conducted a periodic cross-sectional study with all patients living with hypertension and seeking care at the department of cardiology of Ignace Deen national hospital from May 1 to July 31, 2017. We included in this study all patients who agreed to participate in the study.

2.2. Data Collection and Study Variables

Data were collected by last year medical students through individual interviews with patients and from patients' medical records, using a structured questionnaire.

The study variables included: the Demographic characteristics (age, sex, provenance, profession, and education), dietary habits, lifestyle (smoking, alcohol consumption, and physical exercise), and anthropometric measures (weight in kilograms, height in meters) and blood pressure. In the study Body mass index, which is derived by weight in kilograms divided by square of height in meters, was performed for all patients included in the study. Normal body mass index (BMI) was defined as BMI=18.5-24.9 kg/m²; Overweight as BMI 25-29.9 kg/m²; Obesity was defined as BMI > =30 kg/m² and underweight as BMI<18.5 kg/m² [14]. Blood pressure was categorized according to the World Health Organization (WHO) classification, that is,

normal blood pressure (≤ 139 mmHg / ≤ 89 mmHg), Grade 1 hypertension (140 to 149 mmHg / 90 to 99 mmHg), Grade 2 hypertension (160 to 179 mmHg / 100 to 109 mmHg), and Grade 3 hypertension (≥ 180 mmHg / ≥ 110 mmHg) [15].

2.3. Data Analysis

Descriptive variable were presented as proportions or mean (with standard deviation). To identify the factors associated with the presence of parasite in the stool, the Pearson Chi Square, Fischer and Student t tests were used to compare the prevalence of intestinal parasitic infections across the study variables in bivariate analysis. All variables with a P value ≤ 0.20 were included in the logistic regression model. The unadjusted and adjusted odds ratios were derived. The significance level was set at 5 % with a 95 % confidence interval.

The data were analyzed using the EPI Info software version 7.1.5 (Epi Info™, CDC Atlanta, USA).

2.4. Ethical Considerations

The protocol of the study was approved by the Scientific Committee of the Department of Public Health, Faculty of Health Sciences and Techniques, and University of Conakry. An inform consent was obtained from each patient prior to data collection.

Conflict of interest: The authors declare that they have no competing interests.

3. Results

3.1. Socio-Demographic Characteristics of the Patients

A total of 508 patients with hypertension were included in the study. They were in majority males (50.2%), aged over 54 years (51.18%) with a mean age of 55.44 years [Standard deviation (SD): 12.77 years], and living in urban areas (82.68%) (Table 1). Most of them were employees (29.13%), followed by farmers or housewives (27.76%), then sellers (22.64%); the majority had at least a primary school level (61.22%). They were predominantly married or in union (80.12%).

3.2. Body Mass Index and Blood Pressure of the Patients

The majority of the patients was obese (36.22%) or overweighted (33.86%). Patients with normal weight represented 26.97%. Only 2.95% were under weighted (Table 1).

According to WHO's classification, the majority of patients had a normal blood pressure; 23.42% had Grade 1 hypertension, followed by Grade 2 hypertension (11.22%), then Grade 3 hypertension (7.09%). Patients with isolated systolic hypertension represented 10.64%.

Table 1. Socio-demographic characteristics, body mass index and blood pressure of patients with hypertension seeking care at the department of cardiology of Ignace Deen national hospital, Conakry (Guinea), May-July 2017, (N=508).

Variables	Number	Proportion or mean (SD)
Age group (year)		
<35	29	5.71%

Variables	Number	Proportion or mean (SD)
35-54	219	43.11%
>54	260	51.18%
Mean age (SD), year	508	54.44 (12.77)
Sex		
Male	255	50.2%
Female	253	49.8%
Profession		
Employee	148	29.13%
Farmer/housewife	141	27.76%
Seller	115	22.64%
Other*	104	20.47%
Education level		
None	197	38.78%
Primary	311	61.22%
Marital status		
Married/In union	407	80.12%
Unmarried	101	19.88%
Residence area		
Urban	420	82.68%
Rural	88	17.32%
Body mass index		
Underweight ^a	15	2.95%
Normal weight ^b	137	26.97%
Overweight ^c	172	33.86%
Obese ^d	184	36.22%
Blood pressure*		
Normal blood pressure ^e	242	47.63%
Hypertension grade 1 ^f	119	23.42%
Hypertension grade 2 ^g	57	11.22%
Hypertension grade 3 ^h	36	7.09%
Isolated systolic hypertension	54	10.64%

*Unemployed, driver, student; **systolic blood pressure out of diastolic blood pressure

^a <18.5 kg/m²; normal weight: 18.5 kg/m² to 24.9 kg/m²; ^b 25 kg/m² to 29.9 kg/m²; ^c ≥30 kg/m²;

^e ≤139 mmHg / ≤89 mmHg; ^f 140 to 149 mmHg / 90 to 99 mmHg; ^g 160 to 179 mmHg / 100 to 109 mmHg; ^h ≥180mmHg / ≥110 mmHg

3.3. Dietary Habits and Life Style of the Patients

The majority of patients had less than three meals a day (69.88%), and consumed home-made foods (61.61%) (Table 2). The type of diet consumed at least three times a day mostly included oily foods (55.12%), milky foods (39.71%), legumes (35.43%), sugar sweetened foods (34.38%), cereals

(31.1%), and fish or meat (21.85%). Most of patients (87.7%) were following diet recommended by a care provider.

Among the patients, 22.64% were smokers or alcohol consumers. Only 13.58% were practicing physical exercises on regular basis.

Table 2. Dietary habits and life style of patients with hypertension seeking care at the department of cardiology of Ignace Deen national hospital, Conakry (Guinea), May-July 2017, (N=508).

Characteristics	Number	Proportion
Number of meals per day		
< 3	355	69.88%
≥ 3	153	30.12%
Place of food preparation		
Home	313	61.61%
Restaurant/fast food/kiosks	195	38.39%
Type of diet		
Oily food at least 3 times a day	280	55.12%
Fruits or vegetables at least 3 times a day (N=115)	47	40.87%
Milky food at least 3 times a day (N=494)	195	39.71%
Legumes at least 3 times a day	180	35.43%
Sugar sweetened food at least 3 times a day (N=445)	153	34.38%
Cereals at least 3 times a day	158	31.10%
Fish or meat at least 3 times a day	111	21.85%
Tuber at least 3 times a day (N=370)	43	11.62%
Following diet recommended by a care provider		
Yes	445	87.7%
No	63	12.4%
Smokes or drinks alcohol		

Characteristics	Number	Proportion
Yes	115	22.64%
No	393	77.36%
Practices physical exercises on regular basis		
Yes	69	13.58%
No	439	86.42%

3.4. Factors Associated with Obesity or Overweight

The bivariate analysis showed that patients' age, sex, educational level, and smoking or consumption of alcohol were associated with obesity or overweight among patients with hypertension seeking care at the department of cardiology of Ignace Deen national hospital of Conakry (Table 3). However in the multiple logistic regression, only sex and education level were independently associated with obesity or overweight. Female patients were two times more

likely to be obese or over weighted than male patients [Adjusted Odd Ratio (AOR): 2.14; 95% confidence interval (C.I): 1. 1.36-3.36]. Patients with at least primary school level were 47% less likely to be obese or over weighted than patients who had not attended school (AOR: 0.53; 95%C.I: 0.35-0.82). Even though this was not statistically significant, patients who were following a diet recommended by a care provider 43% less likely to be obese or over weighted.

Table 3. Logistic regression of obesity or overweight among patients with hypertension seeking care at the department of cardiology of Ignace Deen national hospital, Conakry (Guinea), May-July 2017, (N=508).

Characteristics	Obese or over weighted (yes)			
	N (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	P-value
Mean age (SD)	53.55 (13.03)	0.98 (0.967-0.996)	0.99 (0.97-1.01)	.22
Sex				
Male	161 (63.14)	1	1	
Female	195 (77.08)	1.96 (1.33-2.89)	2.14 (1.36-3.36)	0.001
Profession				
Farmer/Housewife	102 (72.34)	1		
Other profession ^a	254 (69.21)	0.86 (0.55-1.32)	-	.56
Education level				
None	231 (74.28)	1	1	
Primary or more	125 (63.45)	0.60 (0.41-0.88)	0.53 (0.35-0.82)	.004
Marital status				
Married/In union	282 (69.29)	0.82 (0.51-1.34)	-	.44
Unmarried	74 (73.27)	1		
Residence area				
Rural	61 (69.32)	0.96 (0.58-1.58)	-	.86
Urban	295 (70.24)	1		
Number of meals per day				
< 3	250 (70.42)	1		
≥ 3	106 (69.28)	0.95 (0.62-1.43)	-	.63
Place of food preparation				
Home	218 (69.65)	1		
Restaurant/fastfood/kiosks	138 (70.77z0)	1.06 (0.71-1.56)	-	.79
Consumption of oily product at least 3 times a day				
Yes	197 (70.36)	1.03 (0.70-1.51)	-	.88
No	159 (69.740)	1		
Consumption of sugary product at least 3 times a day				
Yes	105 (68.63)	0.97 (0.64-1.49)	-	.91
No	202 (69.18)	1		
Consumption of fruit or vegetables at least 3 times a day				
Yes	30 (63.83)	1.23 (0.57-2.66)	-	.59
No	40 (58.82)	1		
Following medically recommended diet				
Yes	307 (68.99)	0.64 (0.34-1.19)	0.57 (0.30-1.22)	.10
No	49 (77.78)	1	1	
Smokes or drinks alcohol				
Yes	70 (60.87)	0.58 (0.38-0.90)	0.74 (0.45-1.21)	.24
No	286 (72.77)	1	1	
Practices physical exercises				
Yes	51 (73.91)	1		
No	305 (69.48)	1.24 (0.70-2.21)	-	.46

4. Discussion

This study is the first of its kind to examine the frequency and factors associated with obesity or over weight among patients living with hypertension and seeking hypertension related health services in Guinea. It showed that the majority (seven patients out of ten) patients with hypertension seeking health services at the department of cardiology of Ignace Deen national hospital in Conakry are obese or over weighted. Being female is a risk factor of obesity or over weight, whereas having attended at least primary school is likely to protect against obesity or overweight among these patients. The high proportion of obesity or overweight among patients with hypertension is supported by the literature that shows the first ones as risk factor of the latter [2]. Likewise our findings, studies have reported females to be more likely to be obese or over weighted than males [16, 17]. Hulzebosch *et al.* in 2015 found that among patients living with hypertension in Nairobi (Kenya), women were more likely to be overweight/obese than men [16]. Similar finding was reported by Akintunde *et al.* 2010 in Nigeria showing higher proportion of obesity among women than men [17]. What's more, it has been reported that patients with higher education level to be less likely obese or over weighted [18]. Particular medical follow up on and regular counseling about life style for female patients living with hypertension would be relevant during clinical practices to help prevent complications due to hypertension.

The findings of this study also showed that patients following diet recommended by a care provider are less likely to be obese. It has been shown that diet is a key factor for obesity prevention [10]. This calls practitioners to follow up on hypertension patients' diet. However, one should highlight challenges surrounding compliance with such recommendations in resource constraint areas, like in Guinea. Low compliance with dietary recommendations among patients with hypertension has been reported [19]. The present study found that 87.7% of patients follow recommendations related to their diet; however, the majority of them has less than three meals a day or consumes oily food at least three times a day. While dealing with a chronic disease such as hypertension, limited access to recommended diet might lead patients to deviate providers' recommendations related to diet.

This study also showed that adopting appropriate life style is a challenge among patients living with hypertension in Guinea. It showed that one patient out of five seeking health services for hypertension smokes or drinks alcohol and that, more than four patients out of five do not practice physical exercises on regular basis. Yet, complying with lifestyle recommendations are key to controlling hypertension [20]. This supports that compliance of hypertension patients with providers' recommendations is of concern in Guinea and requires more attention and further research for behavior change.

The main limitation of our study is that it was a hospital-based study and was restricted to one hospital; it is therefore

difficult to map the actual nutritional profile among patients with hypertension within the general population. However, this study was conducted in a countrywide referral hospital; our findings therefore provide baseline information that can guide further researches and intervention for improvement of policies and practices to control non communicable diseases in Guinea.

5. Conclusion

The majority of patients with hypertension seeking health services at the department of cardiology of Ignace Deen national hospital in Conakry is obese or over weighted. Being female is a risk factor of obesity or over weight, whereas having attended at least primary school is likely to protect against obesity or overweight among these patients.

The present study calls care providers in Guinea to a regular medical follow up on female or illiterate patients with hypertension to prevent complications. Provider should also integrate in practices particular counseling of these patient groups about their life style, *i.e.*, diet, physical exercises, smoking, and alcohol consumption.

However, this study recommends further research to understand reasons for non-compliance of hypertension patients with diet recommended by care providers.

Authors' Contributions

SS and BIS were involved with conception and design of the protocol. SS, BIS, and BSC were involved with acquisition of data. SS and BSC did the data analysis and all authors were involved with interpretation. All authors have given approval for the final version to be published and are accountable. All authors read and approved the final version.

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