

Cardiovascular Risk Factors in Black African Obese Patients: A Multicentric Comparative Study in 1512 Patients in Lome (Togo)

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Abstract

Background: In most cases obesity is associated with other cardiovascular risk factors, making obese patients high-risk subjects.

Objective : The objective of this study was to compare the prevalence of cardiovascular risk factors in obese patients versus patients of normal weight.

Patients and Methods: In this multicenter, prospective, comparative study, which run from May 1st, 2010 to April 31st, 2011, we screened for cardiovascular risk factors in 2 groups of outpatients in 3 hospitals in Lome: Group 1: obese patients (body mass index, BMI ≥ 30 kg/m²) and Group 2: normal weight patients (BMI=18-25 kg/m²).

Results: Of 1512 patients seen in the outpatient departments, 515 were obese (prevalence 34.1%), with an average age of 48.4 ± 11.2 years. Obesity was more common in women (42%). A comparative analysis showed that other cardiovascular risk factors were statistically significantly more common in obese patients than in normal weight patients ($p < 0.05$): sedentary lifestyle (88% vs. 54%), hypertension (64.3% vs. 37.2%), hypercholesterolemia (44.1% vs. 23%), diabetes (30.3% vs. 9.3%), diet high in fats and sugars (67.2% vs. 32%) but low in fruit and vegetables (62.5% vs. 23.6%).

Conclusion: Obesity is a public health problem in Togo and is often associated with other risk factors for cardiovascular disease. It is important to educate the population concerning preventive measures in the fight against obesity and other cardiovascular risk factors.

Keywords: Obesity; Risk factors; Sub-Saharan africa; Togo

Introduction

Obesity, which is a major cardiovascular risk factor, has now become a worldwide epidemic. The World Health Organization estimates that more than one billion adults worldwide are overweight and that 300 million of them are obese [1]. In industrialized countries, the frequency of obesity has increased over the last ten years by 5% to 10% [2,3]. An increase in the prevalence of obesity has also been confirmed by various studies carried out in African countries [4-7]. In most cases obesity is associated with other cardiovascular risk factors, making obese patients high-risk subjects. The epidemiological data on obesity need updating in Togo. The objective of this study was to compare the prevalence of cardiovascular risk factors in obese patients versus patients of normal weight, seen as cardiology outpatients in Lome.

Methodology

This multicenter, prospective, comparative study was carried out between May 1st 2010 and April 31, 2011 in 2 groups of cardiology outpatients at least 18 years of age at 3 health centers in Lomé ("Saint-Esprit" Cardiovascular Explorations Center, Saint Joseph International Polyclinic, Hope Clinic). Group 1: obese patients (body mass index BMI ≥ 30 kg/m²) and Group 2: patients with normal bodyweight (BMI: 18-25 kg/m²). Hospitalized patients and patients suffering from a congenital heart disease were no included.

The following parameters were investigated: sociodemographic data (age, sex, occupation), clinical data (blood pressure, bodyweight, height, waist measurement, hip measurement, BMI), and other cardiovascular risk factors (hypertension, diabetes, dyslipidemia, smoking, stress, sedentary lifestyle, diet). Body weight was determined using scales with the patient undressed and without shoes. The waist measurement was taken using a tape measure, and with the patient without shoes. BMI was determined as weight (kg)/ [height (m)]². Overweight was defined

as a BMI between 25 and 29.9 kg/m², common obesity as between 30 and 34.9 kg/m², and morbid obesity as above 35 kg/m².

Waist and hip measurements were taken using a tape measure with the subject undressed and standing upright. When the waist measurement/hip measurement ratio was less than 0.9 in women and less than 1 in men, the obesity was classified as gynoid; otherwise it was classified as android [8]. Blood pressure was determined using an Omron M6 blood pressure monitor, after the patient had been lying down and resting for at least ten minutes. Three determinations were carried out if the initial values were high. Smoking was defined as smoking at least one cigarette per day, alcohol use as the regular consumption of alcohol regardless of the quantity consumed, and a sedentary lifestyle by lack of physical activity or less than 30 minutes of sport activity at least three times a week. Stress was evaluated by means of Cunci's quick assessment score [9], and was defined by a score of ≥ 30 . For laboratory data, values adopted were a blood glucose <1.26 g/L, total cholesterol <2 g/L, LDL-cholesterol <1.6 g/L, HDL-cholesterol >0.40 g/L, triglycerides <1.5 g/L. Blood glucose was checked in patients with a first measured value >1.26 g/L.

Recorded data were analyzed using Epi Info software version 3.5.1.

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χ^2 tests (Pearson and Yates) were used for comparisons of proportions, and Student's t-test was used for comparisons of means and the logistic regression. The threshold of significance adopted was a value of $p < 0.05$.

Results

General characteristics of the sample (Table 1)

Our study sample of 1512 patients comprised 882 women (58.3%) and 630 men (41.7%) (Sex ratio 0.7). The mean age was 51 ± 10 years (18 to 92), with 314 patients (20.8%) under 40 years of age, 625 (41.3%) between 40 and 59, 354 (23.4%) between 60 and 70, and 219 (14.5%) over 70. Most patients (95.8%) lived in an urban setting. With regard to education, 659 patients (43.6%) had not attended school, 483 (31.9%) had left school without a baccalaureate, 172 (11.4%) had passed the baccalaureate, and 198 (13.1%) had a university level education.

Overweight and obesity (Table 2)

Overweight and obese patients (BMI > 25 kg/m²) accounted for 57.5% (n=869) of patients: 365 men (42%) and 504 women (58%), with a sex ratio of 0.7 ($p=0.03$). Overweight (BMI: 25-29.9) was identified in 354 patients (23.4%).

Obesity (Group 1 with BMI ≥ 30 kg/m²) was identified in 515 patients, 371 of them women (72%) and 144 of them men (28%). The prevalence of obesity was 34%: common obesity (n= 319; 62%) and morbid obesity (n= 196; 38%). The mean age of the obese patients was 48.6 ± 11.3 years (range 18 to 82). The obesity was android (male pattern) in 64.8% of cases (n= 334) and gynoid (female pattern) in 35.2% (n=181). The prevalence of obesity was 22.8% in the men and 42% in the women ($p= 0.001$). Most of the men (n=124; 85.2%) had android-type obesity and most of the women (n=267; 71.9%) had gynoid-type obesity (Table 2). The following family histories were identified in these patients: obesity (63.2%), hypertension (44.1%), diabetes (11.3%), hypertension plus diabetes (9.1%).

Patients with normal bodyweight (Group 2)

The patients with normal bodyweight (BMI: 18-25 kg/m²) corresponded to 42.5% of the population (n=643) and had an average age of 51 ± 10 years. In this group, there were 376 men (58.5%) and

267 women (41.5%) ($p=0.003$). The family history identified in these patients consisted of obesity (11.4%), hypertension (8.2%), diabetes (3.4%), hypertension + diabetes (3.1%).

Prevalence of cardiovascular risk factors and complications

The frequencies of other cardiovascular risk factors in obese patients, compared with those in the normal bodyweight patients, are summarized in Table 3. The prevalence of metabolic syndrome was 16.3%. In the group of obese patients, 47% had at least 2 risk factors in addition to obesity, compared with 22.6% in subjects with normal bodyweight. The mean number of modifiable risk factors was 3 ± 0.8 in the obese subjects and 1.3 ± 0.7 in subjects with normal bodyweight ($p=0.001$).

The frequencies of cardiac complications in the obese patients and in the patients with normal bodyweight were as follows: hypertrophy of the left ventricle (44.3% vs. 21.5%; $p=0.002$; odds ratio [OR]=2), dilatation of heart chambers (41.7% vs. 18.8%; $p=0.0001$; OR: 2.2), coronary failure (32.8% vs. 21%; $p=0.001$; OR: 1.5), heart failure (26.8% vs. 9.9%; $p=0.003$; OR: 2.7), cardiac arrhythmia (28.6% vs. 13.9%; $p=0.002$; OR: 2), renal failure (18.7% vs. 6.2%; $p < 0.0001$; OR: 3), stroke (7.1% vs. 2.7%; $p=0.007$; OR: 2.6).

Discussion

The prevalence of obesity is steadily increasing both in developed [10-12] and developing countries [4-7,13]. The prevalence of obesity in our study was close to that found in other African studies [4-7], and most of the studies also found a predominance of female obesity [4-7,14,15]. Monteiro et al. in Brazil [16] observed that the prevalence of obesity was high in patients with a low level of education (un schooled and primary education). Obesity is a chronic pathological condition with multiple etiologies, including genetics, the environment, lifestyle, and diet. In our study, a familial factor was often identified, as well as a sedentary lifestyle, and a diet too high in fats and sugars, but low in fruit and vegetables.

Numerous epidemiological studies have revealed the role of obesity as an independent risk factor for cardiovascular diseases [17]. In our study, the obese patients often cumulated several cardiovascular risk factors, with a mean number virtually 3 times higher than that in subjects with a normal bodyweight. It has been shown that obesity is also a risk factor for other diseases, which are themselves risk factors for cardiovascular diseases such as diabetes, dyslipidemia, and hypertension [18]. This readily explains why the frequency of the other cardiovascular risk factors (hypertension, type 2 diabetes, dyslipidemia) is higher in the obese patients, so that these patients have a high cardiovascular risk. Indeed, cardiovascular complications were more frequent in the obese patients than in the subjects with normal bodyweight. Pouchain et al. [19] demonstrated that hypertension and type 2 diabetes were equally strongly associated with abdominal obesity. Identifying the presence of these risk factors in an obese subject should lead to tests for metabolic syndrome, a major risk factor for cardiovascular diseases [20,21]. The findings of our study show that the prevention of obesity is an unavoidable part of the fight against cardiovascular diseases. This prevention involves a change in lifestyle with regular physical activity, a diet rich in fruit and vegetables, but low in sugars, fats, salt, and red meat. The protective role of regular physical activity against cardiovascular diseases can be explained by the fact that it leads to a fall in bodyweight, a lowering of blood pressure, an increase in HDL, a reduction of triglycerides, an increase in glucose tolerance, and a reduction in the blood glucose level [22,23].

	Women	Men	Total
Population	882 (58.3%)	630 (41.7%)	1512
Mean age (years)	48 \pm 3	48 \pm 6	48 \pm 4
Mean bodyweight (Kg)	70.7 \pm 10	75.1 \pm 17	72.6 \pm 15
Mean height (cm)	159 \pm 7	170 \pm 8	164 \pm 9
Mean BMI (Kg/m ²)	28 \pm 4.2	26 \pm 4.2	27 \pm 4.2
Mean SBP (mm Hg)	137 \pm 16.18	136 \pm 15.70	135 \pm 15.20
Mean DBP (mm Hg)	83 \pm 10.34	85 \pm 9.60	85 \pm 9.22

Table 1: General characteristics of the study population (n=1512)

Age (years)	Obese subjects			Subjects with normal bodyweight		
	Men n(%)	Women n (%)	Total n (%)	Men n(%)	Women n(%)	Total N (%)
18-30	5 (3.5)	11 (2.9)	16 (3.1)	8 (2.1)	9 (3.4)	17 (2.6)
30-40	10 (6.9)	31 (8.3)	41 (7.9)	31 (8.2)	19 (7.1)	50 (7.8)
40-50	46 (31.9)	102 (27.5)	148 (28.7)	112 (29.8)	100 (37.4)	212 (32.9)
50-60	51 (35.4)	111 (30)	162 (31.5)	126 (33.5)	95 (35.6)	221 (34.4)
60-70	21 (14.6)	72 (19.5)	93 (18.1)	45 (11.9)	30 (11.2)	75 (11.6)
>70	11 (7.7)	44 (11.8)	55 (10.7)	54 (14.3)	14 (5.2)	68 (10.6)
Total	144 (100)	371 (100)	515 (100)	376 (100)	267 (100)	643 (100)

Table 2: Distribution of the patients in Groups 1 and 2 as a function of age and sex

	Obesity % (n)	Normal bodyweight % (n)	p	Odds ratio
Hypertension	58 (299)	27.2 (175)	<0.001	2.1
Sedentary lifestyle	84 (433)	41 (263)	<0.001	2
Diabetes	38.4 (198)	9.3 (60)	<0.001	4.1
Hypercholesterolemia	44.2 (227)	23.6 (152)	0.001	1.8
Hypertriglyceridemia	17.3 (89)	11.3 (73)	0.002	1.5
Low LDH	13.8 (71)	9 (58)	0.01	1.4
Diet high in fat and sugar	67.2 (346)	32 (206)	0.001	2.1
Diet low in fruit and vegetables	62.5 (322)	23.6 (152)	0.001	2.6
Smoking	14.1 (72)	16.2 (104)	0.43	0.8
Alcohol	9 (46)	12.3 (79)	0.01	0.7
Stress	64.8 (334)	68.7(442)	0.12	0.9

Table 3: Comparison of cardiovascular risk factors prevalence in obese patients and in patients with normal bodyweight

Conclusion

Obesity is a public health problem in Togo. Its prevalence is high in cardiology outpatients. In most cases it is associated with other cardiovascular risk factors, making obese patients high-risk subjects. It is essential to educate the population in order to prevent and fight against obesity, and this involves adopting a healthy diet and the practice of regular physical activity.

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