Prevalence of obesity and cardiovascular risk in patients with HIV/AIDS in Porto Alegre, Brazil

Prevalência de obesidade e risco cardiovascular em pacientes com HIV/AIDS em Porto Alegre, Brasil

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ABSTRACT

Objective: The aim of this study was to discover the prevalence of overweight, obesity and cardiovascular risk in our HIV/AIDS outpatients according to sex, antiretroviral therapy and other variables. **Subjects and methods:** Patients underwent an anthropometric assessment. Body mass index and waist circumference were used to classify their nutritional status and their cardiovascular risk. **Results:** The majority of the 345 patients (58.8%) were males. Obesity was detected in 8.3% of them; 34.2% were overweight, and 5.2% malnourished. Near half of them (51.3%) had some cardiovascular risk, with increased risk in 24.6% of them, and substantially increased risk in 26.7% of them. **Conclusions:** Overweight and obesity were highly prevalent. Women were more frequently obese (OR = 3.53; IC 95%, 1.47 < OR < 8.69), and their cardiovascular risk was often higher (OR = 6.97; IC 95%, 4.16 < OR < 11.76). The prevalence of obesity and cardiovascular risk did not change according to antiretroviral therapy or other variables. Arq Bras Endocrinol Metab. 2012;56(2):137-41

Keywords
Overweight; obesity; body mass index; HIV; acquired immunodeficiency syndrome

RESUMO

Objetivo: Conhecer a prevalência de sobrepeso, obesidade e risco cardiovascular em nossos pacientes ambulatoriais com HIV/AIDS de acordo com o sexo, tratamento antirretroviral e outras variáveis. **Sujeitos e métodos:** Os pacientes foram submetidos à avaliação antropométrica. O índice de massa corporal e a medida da circunferência da cintura foram utilizados para classificar o estado nutricional e o risco cardiovascular. **Resultados:** A maior parte dos 345 pacientes (58,8%) era do sexo masculino. A obesidade foi detectada em 8,3% deles; 34,2% tinham sobrepeso e 5,2%, desnutrição. Quase a metade (51,3%) apresentou algum risco cardiovascular, com risco elevado em 24,6% e muito elevado em 26,7%. **Conclusões:** O sobrepeso e a obesidade têm elevada prevalência. As mulheres são mais frequentemente obesas (OR = 3,53; IC 95%, 1,47 < OR < 8,69) e seu risco cardiovascular é frequentemente mais alto (OR = 6,97; IC 95%, 4,16 < OR < 11,76). A prevalência de obesidade e de risco cardiovascular não se alterou conforme o tratamento antirretroviral ou outras variáveis. Arq Bras Endocrinol Metab. 2012;56(2):137-41

Descritores
Sobrepeso; obesidade; índice de massa corporal; HIV; síndrome da imunodeficiência adquirida

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INTRODUCTION

HIV infects around 33.4 million people in the world, including 31.3 million adults between 15 and 49 years of age (1). Two million people live with the virus in Latin America (1). The first AIDS case in Brazil was described in 1980. By June 2009, there were approximately 545.000 AIDS cases, from which more than 104.000 occurred in the southern region of the

country (2). In the same period, Rio Grande do Sul, the southernmost state, recorded more than 52.000 cases (2). The reported incidence rate in the capital of the state is the largest in the country, of 106.1 cases per 100.000 inhabitants (2).

At the beginning of epidemic, 60% to 90% of individuals with AIDS had significant malnutrition, characterized by involuntary weight loss and higher mortality (3,4). However, the nutritional status of HIV/AIDS patients has changed since 1996 (3). The advent of combined antiretroviral therapy (cART) increased survival, and resulted in the emergence of complications nonexistent or not perceived, until then, and thought to be drug-related adverse effects. These complications included body fat redistribution, increased fat mass, and changes in circulating lipids and glucose metabolism, all contributing to increased cardiovascular risk (CVR) (5-12).

A study conducted in the USA with HIV-infected patients has shown that obesity is now more common than malnutrition (13). Other studies also reported high frequency of overweight and obesity, and a positive association between these problems and being female (14,15). This was also observed in studies conducted in Brazil, which have shown high prevalence of overweight and obesity among HIV-positive patients (16-18).

The aim of this study was to discover the prevalence of overweight, obesity and CVR in HIV/AIDS outpatients in two reference clinics in Porto Alegre, state of Rio Grande do Sul, Brazil. It also aimed at showing whether excess weight was related to cART or other variables such as sex, length of treatment, CD4+ T lymphocyte (CD4) counts, and viral load (VL).

SUBJECTS AND METHODS

We conducted a cross-sectional study involving HIV/AIDS outpatients of both sexes and over 18 years of age in the Ambulatório de Dermatologia Sanitária (ADS) and in the Hospital de Clínicas de Porto Alegre (HCPA), two reference services in Porto Alegre, Rio Grande do Sul, Brazil. Patients were consecutively enrolled from February to November 2006, during routine outpatient visits.

The outpatients studied were clinically stable and received no cART, or had been on cART for at least six months with two nucleoside reverse transcriptase inhibitor (NRTIs), and either a protease inhibitor (PI) or a non-nucleoside reverse transcriptase inhibitor (NNRTI). They had their CD4 count and their VL measured at least three months before the visit. We excluded patients treated with corticosteroids or anabolic steroids, and those who underwent surgery, had an opportunistic infection in the last six months, had their cART suspended for any reason, or were pregnant. This study was approved by the Ethics Committees in Research of the School of Public Health of Rio Grande do Sul and of the HCPA. All participants signed an informed consent form.

We studied the following variables: sex, age, weight, height, body mass index (BMI), waist circumference (WC), nutritional status, previous cART use, current cART scheme, time on cART, CD4 counts, and VL. Nutritional status was defined according to the BMI, calculated as the ratio between the weight in kilograms and the square of the height in meters (kg/m^2). According to World Health Organization, BMI is an appropriate indicator of nutritional status in adults (19). Patients were considered obese when their BMI was equal or greater than 30 kg/m^2; overweight, when their BMI was between 25 and 29.9 kg/m^2; normal when their BMI was between 18.5 and 24.9 kg/m^2; and malnourished when their BMI was below 18.5 kg/m^2. Patients were weighed and measured without shoes and wearing light clothes by means of a physician scale with a built-in stadiometer.

As recommended by the World Health Organization (20), WC was the only parameter used to assess CVR. For men, WC > 94 cm indicates increased risk, and WC > 102 cm, a substantially increased risk. For women, values for increased and substantially increased risk are > 80 cm and > 88 cm, respectively (20). WC was measured using an inelastic anthropometric tape with accuracy of 0.1 cm.

Variables were initially expressed as absolute frequencies, means, and standard deviations. We used Pearson chi-square to detect differences between categorical variables, and Student's *t* test to detect differences between means. The significance level was set at 5% ($p < 0.05$). We used the Statistical Package for Social Science (SPSS) software, version 17.0, to analyze the data. Odds ratio was calculated by EpiInfo 6.4.

RESULTS

Samples of patients studied in the two health services were homogeneous and comparable (data not shown).

Three hundred and seventy-six patients were initially enrolled. Thirty-two of them refused to participate further. From the 354 remaining subjects, 127 were from the ADS and 218 from the HCPA. Most were male (58.8%). The predominant ethnic group was white (78.5%), followed by blacks (12.5%), and people with mixed ethnic inheritance (9%). Most individuals (60.3%) were from Porto Alegre. As for literacy, we observed that 50.4% had primary education, 30.7% had high school education, and 17.2% had college education. About two-thirds of the individuals (74.2%) were sedentary. In relation to the cART, 40.9% of the patients used two NRTIs plus a NNRTI, 35.1% used two NRTIs plus an IP, and 24.1% were not under treatment. Table 1 shows the cART data.

Overweight was observed in 34.2% of the patients, obesity in 8.4%, and malnutrition in 5.2%. Table 2 shows the nutrition status according to sex. Women were more obese than men (OR = 3.53; IC 95%, 1.47 < OR < 8.69). There was no statistically significant difference in the nutritional diagnosis according to type and length of cART, CD4 counts, or VL (Table 1). Near half (51.3%) were at CVR; 24.6% had increased risk, and 26.7% had substantially increased risk.

Table 2 shows that 77.5% of women and 33% of men were at some degree of CVR. Women had an almost seven times higher chance of being at some degree of CVR than men (OR = 6.97; IC 95%, 4.16 < OR < 11.76). Very high CVR was also more frequent in women (51.4% *vs.* 9.4%). Women had an almost five times higher chance of being at very high CVR than men (OR = 4.98; IC 95%, 2.57 < OR < 9.66).

Table 1 shows age, sex, weight, BMI, nutritional status, WC, CVR, CD4 counts, VL, and length of cART in months, according to current therapy. There were no statistically significant differences.

Table 1. Data on HIV-positive patients according to antiretroviral therapy. Porto Alegre, Rio Grande do Sul, Brazil, 2006

Variables	NNRTI	PI	Untreated
Age			
Mean ± SD	43.05 ± 9.993	44.25 ± 11.268	38.66 ± 9.669
Lower range	41.39	42.22	36.55
Upper range	44.71	46.28	40.77
Sex			
Male	87 (61.7%)	67 (55.4%)	49 (59%)
Weight (kg)			
Mean ± SD	69.14 ± 12.466	68.64 ± 14.036	68.96 ± 13.404
BMI (kg/m²)			
Mean ± SD	24.684 ± 3.62177	25.226 ± 5.15662	24.949 ± 4.37328
Nutritional status			
Malnourished	6 (4.3%)	8 (6.6%)	4 (4.8%)
Normal	75 (53.2%)	63 (52.1%)	42 (50.6%)
Overweight	52 (36.9%)	35 (28.9%)	31 (37.3%)
Obese	8 (5.7%)	15 (12.4%)	6 (7.2%)
WC (cm)			
Mean ± SD	89.11 ± 10.087	90.50 ± 11.915	87.87 ± 11.080
Cardiovascular risk			
No risk	72 (51.1%)	54 (44.6%)	42 (50.6%)
Increased risk	34 (24.1%)	28 (23.1%)	23 (27.7%)
Substantially increased risk	35 (24.8%)	39 (32.2%)	18 (21.7%)
CD4			
Mean ± SD	536.84 ± 247.817	498.50 ± 250.62	504.80 ± 237.89
VL (log)			
Mean ± SD	1.8961 ± 0.63299	2.0580 ± 0.81672	3.9394 ± 0.88774
Length of cART (months)			
Mean ± SD	58.11 ± 32.696	73.89 ± 37.775	-
Total (n = 345)	141	121	83

Note: all values were not significant.

Table 2. Nutritional status and cardiovascular risk according to sex. Porto Alegre, Rio Grande do Sul, Brazil, 2006

Variables	Male	Female	Total
Nutritional status*			
Malnourished	12 (5.9%)	6 (4.2%)	18 (5.2%)
Normal	112 (55.2%)	68 (47.9%)	180 (52.2%)
Overweight	70 (34.5%)	48 (33.8%)	118 (34.2%)
Obese	9 (4.4%)	20 (14.1%)	29 (8.4%)
Cardiovascular risk**			
No risk	136 (67%)	32 (22.5%)	168 (48.7%)
Increased risk	48 (23.6%)	37 (26.1%)	85 (24.6%)
Substantially increased risk	19 (9.4%)	73 (51.4%)	92 (26.7%)
Total	203	142	345

* Pearson Chi-Square = 10.575; p = 0.014.
** Pearson Chi-Square = 89.513; p < 0.001.

DISCUSSION

We found that the prevalence of excess weight (overweight or obesity) was high and greater than the prevalence of malnutrition among HIV/AIDS patients, findings that agree with other studies (13,16,17,21). We found similar frequencies of overweight in women and men. However, like other studies (13-16), obesity was more frequent in women (14% *vs.* 4%). Amorosa and cols. (13), studying obesity prevalence among American HIV-positive patients, found an even greater difference (28% *vs.* 11%). Similar to Jaime and cols. (16), we found no statistically significant differences in nutritional status according to therapy, CD4 counts, or VL.

Data from a Familiar Income Survey conducted in 2008-2009 by the Brazilian Ministry of Health show that excess weight involves 50.1% of men and 48% of women, and that obesity is present in 12.5% of men and 16.9% of women (22). Southern Brazil has the highest percentage of overweight individuals, 56.8% in men and 51.6% in women. In this part of the country, 15.9% of men and 19.6% of women are obese. Thus, the rate of obesity in our HIV-positive female patients (14.1%) is very close to that of the Brazilian population in general (16.9%). This finding was different for males (4.4% in our study *vs.* 12.5% in the overall population).

HIV patients had increased WC when compared to non-HIV controls (23). Near half of our outpatients (51.3%) had CVR, according to their WC. We also observed a significant positive association between CRV and being female. Jaime and cols. (16), using WC measurements in HIV-positive patients, found a substantially increased risk in 6.4% men and in 32.7% women, frequencies lower than those found in our study, 9.4% in men and 51.4% in women. Greater WC is significantly and independently associated with subclinical atherosclerosis (24). It was not possible to compare our CVR values with those of other studies of HIV patients, as different parameters were used, such as the study by Farhi and cols. (18), who studied the waist-to-hip ratio (and found it increased in 28.9% of their patients), or the study by Oketch and cols. (25), who also found an increase in this ratio. However, Pao and cols. (26) observed that increases in WC occur less frequently in people with HIV infection. Another limitation in comparing our data with those of other researchers was that CVR in other studies was often estimated according to the Framingham score (27,28).

Our data and other studies confirm that overweight and obesity are a growing health problem in HIV-positive population. This may be explained by greater survival and less opportunistic infections following the introduction of cART. For this population, changes in lifestyle and, when needed, antilipemic drug therapy are necessary to reduce the prevalence of overweight, obesity, and metabolic complications, such as dyslipidemia and insulin resistance, which contribute to morbidity.

In our AIDS/HIV-positive patients, excess weight (overweight and obesity) was the most common nutritional disorder, especially among women, as occurs in the Brazilian population in general. In our study, WC-related CVR was also increased in women.

As for antiretroviral therapy, we found no statistically significant association between overweight, obesity, estimated CVR, and treatment with PI, NNRTI or no therapy. In our study, treatment apparently had no effect on the prevalence of overweight and obesity.

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