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OCCURRENCE OF ARTERIAL HYPERTENSION IN OBESE PATIENTS

OCORRÊNCIA DE HIPERTENSÃO ARTERIAL EM PACIENTES OBESOS

OCURRENCIA DE HIPERTENSIÓN ARTERIAL EN PACIENTES OBESOS

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ABSTRACT

Objective: to identify the occurrence of arterial hypertension in patients with obesity, candidates for the Bariatric Surgery Program at the University Hospital of Universidade Federal de Mato Grosso do Sul (UFMS), assisted in nursing consultations. **Method:** it is a quantitative, cross-sectional, and retrospective study with analysis of records of patients assisted by the Bariatric Surgery Program of the University Hospital Center (NHU) of UFMS, from 2004 to 2007. For the descriptive analysis of data, one used the software *Epi-Info*, version 3.5.2. The research was approved by the Ethics Committee, Protocol 872/2008. **Results:** out of the 252 patients assisted, 80.15% were female and 19.85% were male; the average age was 36.07 ± 10.16 years; the average weight, height, and BMI values were, respectively, 136.89 ± 91.75 kg, 1.62 ± 0.10 m, and 48.12 ± 6.69 kg.m⁻²; and the systolic, diastolic, and average pressure values were, respectively, 145.10 ± 26.93 mmHg, 98.05 ± 21.22 mmHg, and 121.58 ± 22.97 mmHg. There was a predominance of the comorbidities hypertension (63.49%), dyspnea (55.56%), and lower limb varices (45.63%). **Conclusion:** one observed that the most prevalent disease in obesity was arterial hypertension and its frequency varied according to the BMI and the length of obesity. **Descriptors:** Obesity; Arterial Hypertension; Epidemiology.

RESUMO

Objetivo: identificar a ocorrência de hipertensão arterial em pacientes portadores de obesidade, candidatos ao Programa de Cirurgia Bariátrica do Hospital Universitário da Universidade Federal de Mato Grosso do Sul (UFMS), atendidos em consultas de enfermagem. **Método:** estudo quantitativo, transversal e retrospectivo com análise dos registros dos pacientes atendidos pelo Programa de Cirurgia Bariátrica do Núcleo de Hospital Universitário (NHU) da UFMS, de 2004 a 2007. Para análise descritiva dos dados foi utilizado o programa *Epi-Info*, versão 3.5.2. A pesquisa foi aprovada pelo Comitê de Ética, sob o Protocolo n. 872/2008. **Resultados:** dos 252 pacientes atendidos, 80,15% eram do sexo feminino e 19,85% do sexo masculino; a idade média foi de $36,07 \pm 10,16$ anos; os valores médios de peso, estatura e IMC foram, respectivamente, $136,89 \pm 91,75$ kg, $1,62 \pm 0,10$ m, e $48,12 \pm 6,69$ kg.m⁻²; os valores de pressão sistólica, diastólica e média foram, respectivamente, $145,10 \pm 26,93$ mmHg, $98,05 \pm 21,22$ mmHg, e $121,58 \pm 22,97$ mmHg. Houve predomínio das comorbidades hipertensão (63,49%), dispneia (55,56%) e varizes de membros inferiores (45,63%). **Conclusão:** a doença mais prevalente na obesidade foi a hipertensão arterial e sua frequência variou de acordo com o IMC e o tempo de obesidade. **Descritores:** Obesidade; Hipertensão Arterial; Epidemiologia.

RESUMEN

Objetivo: identificar la ocurrencia de la hipertensión arterial en pacientes con obesidad, candidatos al Programa de Cirugía Bariátrica del Hospital Universitario de la Universidade Federal de Mato Grosso do Sul (UFMS), atendidos en consultas de enfermería. **Método:** estudio cuantitativo, transversal y retrospectivo con análisis de los registros de los pacientes atendidos por el Programa de Cirugía Bariátrica del Núcleo de Hospital Universitario (NHU) de la UFMS, de 2004 a 2007. Para el análisis descriptivo de los datos fue utilizado el programa *Epi-Info*, versión 3.5.2. La investigación fue aprobada por el Comité de Ética, el Protocolo 872/2008. **Resultados:** de los 252 pacientes atendidos, 80,15% eran mujeres y 19,85% eran hombres; la edad media fue de $36,07 \pm 10,16$ años; los valores medios de peso, altura y IMC fueron, respectivamente, $136,89 \pm 91,75$ kg, $1,62 \pm 0,10$ m, y $48,12 \pm 6,69$ kg.m⁻²; los valores de presión sistólica, diastólica y media fueron, respectivamente, $145,10 \pm 26,93$ mmHg, $98,05 \pm 21,22$ mmHg, y $121,58 \pm 22,97$ mmHg. Hubo predominio de las comorbilidades hipertensión (63,49%), disnea (55,56%) y várices de miembros inferiores (45,63%). **Conclusión:** se observó que la enfermedad más prevalente en la obesidad fue la hipertensión arterial y su frecuencia varió según el IMC y el tiempo de obesidad. **Descriptores:** Obesidad; Hipertensión Arterial; Epidemiología.

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INTRODUCTION

Obesity is a complex disease which affects all age groups and social groups, with major social and psychological consequences. The genetic factor is an important determinant in the susceptibility of a person with regard to weight gain, with the weight balance determined by calorie intake versus physical activity. Thus, the epidemic obesity is driven by societal changes and dietary habits, posed by the economic growth, modernization, urbanization, and globalization.^{1,2}

Obesity is included into the group of non-communicable diseases (NCDs) and its prevalence has increased to epidemic proportions, both in the developed and developing countries. Worldwide, more than 1 billion adults are overweight and, out of them, more than 300 million are obese, something which constitutes the main component of chronic and limiting diseases.³

In Brazil, about 40% of the population is over its weight, out of these individuals, 10.1% are obese and 28.5% are overweight. The mortality rate is 12 times higher in morbidly obese individuals when compared to people with normal weight and age between 25 and 40 years.⁴ Weight gain is regarded as the main risk factor for chronic diseases related to the diet, such as type 2 diabetes mellitus, cardiovascular disease, hypertension, and even certain kinds of cancer. The consequences range from increased prevalence of premature death to major chronic conditions which reduce the quality of life.^{5,6}

Studies show bariatric surgery as a more effective kind of treatment for cases of morbid obesity class III. The surgery purpose consists in improving not only the quality of life, but also increasing the obese person's lifetime and solving the problems with a physical and psychosocial nature caused by excessive weight.⁷ In this context, one aims to identify the occurrence of arterial hypertension in patients with obesity, candidates for the Bariatric Surgery Program of the University Hospital of Universidade Federal de Mato Grosso do Sul (UFMS), assisted during the nursing consultations.

METHOD

Paper developed from the dissertation **Epidemiological profile of obese patients at the Bariatric Surgery Program of a hospital-school in Campo Grande, Mato Grosso do Sul, Brazil**, presented to the Graduate Program in Health and Development in the

Central-West Region of Dr. Hélio Mandetta School of Medicine of Universidade Federal de Mato Grosso do Sul. Campo Grande-MS, Brazil. 2008.

This is a quantitative, cross-sectional and retrospective, study with analysis of the medical records of patients undergoing evaluation during nursing consultations at the Bariatric Surgery Program of University Hospital Center (NHU) of UFMS. The collected data refer to the evaluations carried out between October 2004 and February 2007 at the Outpatient Bariatric Surgery Ward. In this evaluation the nurse conducted the interview and physical examination aimed at the assessment with regard to the surgery criteria.

The population under study comprises all patients who are candidates for the Bariatric Surgery Program of NHU/UFMS. Of them, only 252 patients were included in this study, as they complied with the criteria set for inclusion and exclusion. All of them were evaluated with regard to the occurrence of comorbidities defined in the medical records. Hypertension was defined as an inclusion criterion due to the presence of arterial systolic blood pressure > 140 mmHg or arterial diastolic blood pressure > 95 mmHg or the already established use of antihypertensive medications. One excluded the medical records who didn't have sufficient data to characterize arterial hypertension as a diagnosed comorbidity.

Data were collected through a specific printed form, prepared for this purpose. Data entry was performed using the software *Microsoft Excel*, for descriptive and inferential analysis. For the descriptive data analysis one used the software *Epi-Info*, version 3.5.2.

The research was approved by the Ethics Committee of UFMS, under the Protocol 872/2008.

RESULTS

One evaluated 252 patients aged between 17 and 66 years, with a mean age of 36.07 $\pm$ 10.16 years (mean $\pm$ standard deviation). Regarding gender, 202 (80.15%) were female and 50 (19.84%) were male. Out of those who reported ethnicity, 212 (86.53%) were white, 8 (3.26%) were mulattos, 13 (5.31%) were dusky, and 12 (4.90%) were blacks.

Regarding the patients' clinical data, in general, one obtained the mean values related, respectively, to weight, height, and BMI of 136.89 $\pm$ 91.75 kg, 1.62 $\pm$ 0.10 m, and 48.12 $\pm$ 6.69 kg.m⁻².

Concerning blood pressure, the values observed, respectively, for systolic, diastolic, and mean pressure were 145.10 ±26.93 mmHg, 98.05 ±21.22 mmHg, and 121.58 ±22.97 mmHg.

Table 1 portrays the most frequent diseases, with a prevalence of comorbidities:

160 cases of hypertension (63.49%); 140 cases of dyspnea (55.56%); 115 cases of varices lower limb varices (45.63%); and 92 cases of depression (36.51%).

Table 1. Distribution of patients assisted at the Bariatric Surgery Program according to comorbidities – NHU/UFMS, 2004-2007 (n = 252).

Comorbidity	Number of patients (%)	
	Present	Absent
Sleep apnea	44 (17.46%)	208 (82.54%)
Arrhythmias	33 (13.10%)	219 (86.90%)
Arthrosis	67 (26.59%)	185 (73.41%)
Asthma	15 (5.95%)	237 (94.05%)
BED ¹	15 (5.95%)	237 (94.05%)
Bronchitis	20 (7.94%)	232 (92.06%)
Cholelithiasis	16 (6.35%)	236 (93.65%)
Depression	92 (36.51%)	160 (63.49%)
Diabetes mellitus	25 (9.92%)	227 (90.08%)
Erectile dysfunction ²	09 (18%)	41 (82%)
Exertional dyspnea	140 (55.56%)	112 (44.44%)
Menstrual disorders ³	58 (28.71%)	144 (71.29%)
GERD ⁴	34 (13.49%)	218 (86.51%)
Hemorrhoids	21 (8.33%)	231 (91.67%)
Hypertension	160 (63.49%)	92 (36.51%)
Hyperthyroidism	01 (0.40%)	251 (99.60%)
Hypothyroidism	14 (5.56%)	238 (94.44%)
Hirsutism ³	78 (38.61%)	124 (61.39%)
Heart failure	07 (2.78%)	245 (97.22%)
Bedwetting	39 (15.48%)	213 (84.52%)
Nephrolithiasis	21 (8.33%)	231 (91.67%)
Lower limb varices	115 (45.63%)	137 (54.37%)
Peptic ulcer	05 (1.98%)	247 (98.02%)
Other comorbidities	128 (50.79%)	124 (49.21%)

(1) Binge eating disorder – compulsive food intake. (2) One assigns to this comorbidity only male patients (n = 50). (3) One assigns to these comorbidities only female patients (n = 202). (4) Gastroesophageal reflux.

In Table 2 one detects the prevalence of comorbidities: depression, diabetes mellitus, exertional dyspnea, hypertension, and varices

in the lower limbs, as well as their relation to the patients’ BMI.

Table 2. Number and percentage of patients according to comorbidities and BMI – NHU/UFMS, 2004-2007 (n = 252).

Comorbidity	Presence	Number of patients (%) according to the BMI			P value ¹
		BMI < 40 kg/m ²	BMI between 40 and 50 kg/m ²	BMI > 50 kg/m ²	
Depression	Yes	09 (40.00%)	58 (37.17%)	25 (30.86%)	0.09
	No	06 (60.00%)	98 (62.82%)	56 (69.14%)	Ns
Diabetes mellitus	Yes	00 (0.00%)	14 (8.97%)	11 (13.58%)	0.22
	No	15 (100.00%)	142 (91.02%)	70 (86.42%)	Ns
Exertional dyspnea	Yes	10 (66.67%)	88 (56.42%)	42 (51.85%)	0.54
	No	05 (33.33%)	68 (43.58%)	39 (48.15%)	Ns
Hypertension	Yes	05 (33.33%)	102 (65.38%)	53 (65.43%)	0.04
	No	10 (66.67%)	54 (34.61%)	28 (34.57%)	Sig
Lower limb varices	Yes	08 (53.33%)	66 (42.30%)	41 (50.62%)	0.39
	No	07 (46.67%)	90 (57.69%)	40 (49.38%)	Ns

(1)P value in the x² test; Ns = non-significant relation; Sig = significant relation.

By examining Figure 1, it’s possible to observe a significant relation between the presence of hypertension and the patients’

BMI (x² test, p = 0.04), as well as between the presence of hypertension and the patients’ length of obesity (x² test, p < 0.001).

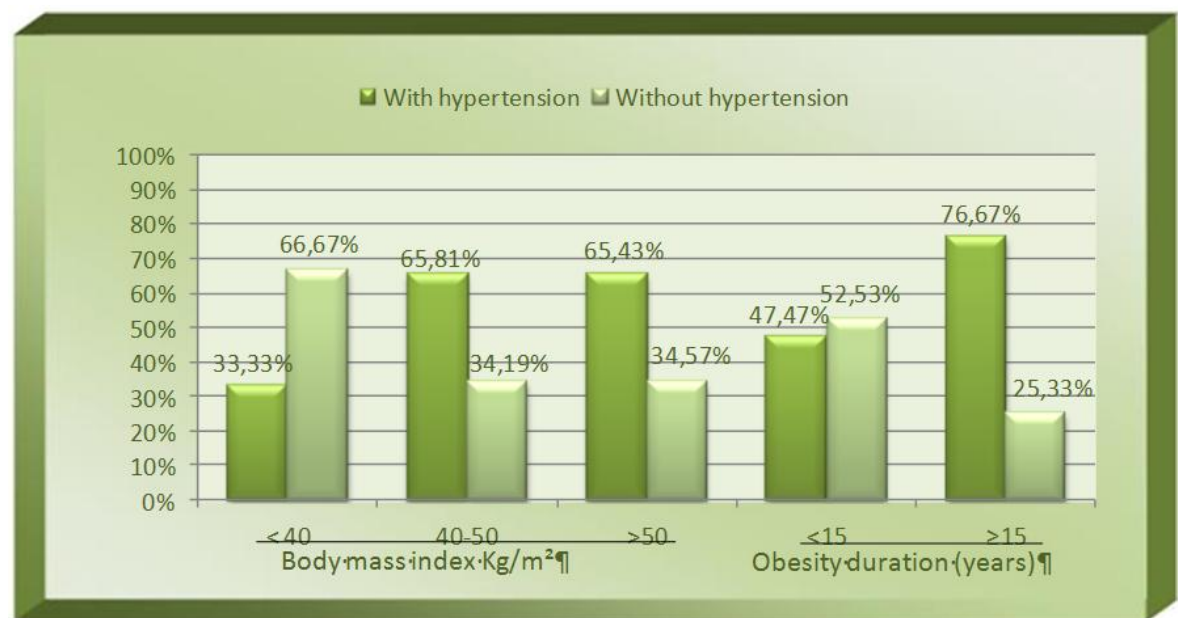


Figure 1. Percentage of patients with and without hypertension with regard to BMI and length of obesity – NHU/UFMS, 2004-2007 (n = 252).

Table 3 shows the prevalence of the most frequent comorbidities in this study and their relation to the patients’ length of obesity. One sees that the other comorbidities, except

hypertension and menstrual disorders, showed no significant relation between them and the patients’ length of obesity (p > 0.05).

Table 3. Number and percentage of patients according to comorbidities and length of obesity – NHU/UFMS, 2004-2007 (n = 252).

Comorbidity	Presence	Number of patients (%) according to the length of obesity		P value ¹
		< 15 years	≥ 15	
Hypertension	Yes	48 (47.05%)	112 (74.67%)	< 0.001
	No	54 (52.94%)	38 (25.33%)	Sig
Depression	Yes	32 (31.37%)	60 (40.00%)	0.206
	No	70 (68.62%)	90 (60.00%)	Ns
Lower limb varices	Yes	44 (43.13%)	71 (47.33%)	0.598
	No	58 (55.86%)	79 (52.67%)	Ns
Hirsutism ²	Yes	30 (37.04%)	48 (39.67%)	0.819
	No	51 (62.96%)	73 (60.33%)	Ns
Exertional dyspnea	Yes	61 (59.80%)	79 (52.67%)	0.322
	No	41 (40.19%)	71 (47.33%)	Ns
Menstrual disorders ²	Yes	30 (37.04%)	28 (23.14%)	0.047
	No	51 (62.96%)	93 (76.86%)	Sig

(1) P value in the x² test; Ns = non-significant relation; Sig = significant relation. (2) One assigns to these comorbidities only female patients (n = 202).

DISCUSSION

Out of the 252 patients assisted due to obesity, the mean age was 36.07 years, the mean BMI was 48.12 kg/m², with a predominance of females: 202 (80.1%). Obesity causes pathological changes in the body which lead to an increase in size or production of hypertrophic fat cells associated to clinical complications, such as type II diabetes mellitus, cholelithiasis, coronary cardiovascular diseases (CCVDs), hypertension, stroke, hyperlipidemia, hepatic steatosis, sleep apnea, joint osteoarthritis, gout, and some types of cancer (lung, endometrial, and colon). It can also cause hypercholesterolemia, pregnancy complications, menstrual irregularity, hirsutism, urinary incontinence, increased risk in surgical interventions, and psychological disorders, such as Binge eating disorder (BED) – compulsive food intake and depression.^{9,10}

Medical treatment is the first option for obesity treatment. It usually includes the use of anorectic or disabsorptive agents, in addition to psychological, physiotherapeutic, and dietary treatments, and physical exercise, with satisfactory results in cases where there’s patient adherence to treatment, predominantly in mild to moderate obesity forms (overweight and obesity).²

Most medicines used for obesity involves pharmacologically sympathomimetic agents associated to amphetamines. Both of them suppress appetite, stimulate the satiety center located at the hypothalamus, and show as a major side effect increased blood pressure, besides intestinal constipation, dry mouth, headache, insomnia, vertigo, and jitters.^{9,11} By addressing the most frequent comorbidities, one found out, in descending order, the prevalence of hypertension, dyspnea, varices, and depression. Similar data were found in other studies which pointed out

hypertension as the most frequent comorbidity.^{12,13}

A study carried out in the city of Porto Alegre concluded that obesity was responsible for an increase of about 70% in the risk of incident arterial hypertension.¹⁴ Another survey conducted in the outpatient ward of Universidade Federal de Sao Paulo, within the period from 1998 to 1999 with 499 patients, showed that the prevalence of arterial hypertension in patients with class III obesity was 67.1%.¹⁵ Similar results were found in Bahia, with a hypertension prevalence of 66.7% among 316 patients diagnosed with class III obesity.¹⁶ Other study conducted between 1999 and 2000 in the United States showed that the prevalence of hypertension rose 3.7%, assigning 2.0% of this increase to BMI.¹⁷

A study carried out with 1,025 patients at the University Hospital of the Medical College of Virginia (USA) found, among other comorbidities, 51% of hypertension and 15% of type 2 diabetes mellitus. An interesting finding was that among patients with diabetes mellitus, 75% were hypertensive.¹⁸ In this study, one found a significant relation between the presence of hypertension and the patients' BMI, as well as between the presence of hypertension and the length of obesity. The longer obesity is, the more severe it is, and the patient is more likely to develop hypertension.

Hypertension in obese individuals should be regarded as the most common manifestation of hypertensive disease. In the Framingham study, there's the suggestion that hypertension is directly attributable to overweight and obesity in about 75% of hypertensive men and 65% of hypertensive women.¹⁹ Among the diseases related to obesity, arterial hypertension is the most common of comorbidities. Hypertension and high BMI are closely associated in people aged less than 55 years and about 80% of people with type 2 diabetes mellitus are obese.⁹

CONCLUSION

Out of the 252 patients assisted due to obesity, the mean age was 36.07 years, with an average BMI of 48.12 kg/m², with a predominance of females and white colored people. Obesity is a complex disease, aggravated by comorbidities or related diseases which can reach various segments of the body and increase the severity of this epidemic.²⁰

Hypertension is the most frequent disease in class III obesity, followed by other

conditions such as exertional dyspnea, lower limb varices, and depression. The frequency of hypertension varies according to the BMI and the length of obesity, that is, the higher the length of obesity, the bigger the occurrence of hypertension.

Thus, health professionals, especially nurses who participate in evaluations by the bariatric surgery programs, should be aware of these comorbidities, as well as the high frequencies of hypertensive patients within the group of such a specific segment, which requires specific care procedures for achieving success in this treatment modality.

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