50 - TEN YEARS OF EXPERIENCE WITH BARIATRIC SURGERY IN SOUTHERN BRAZIL

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INTRODUCTION

Obesity is one of the most serious problems in public health, and in recent decades its incidence has increased considerably, not only in developed countries, but also in developing countries, transforming it into a global epidemic (CONSENSO LATINO-AMERICANO DE OBESIDADE, 2009). Approximately two-thirds of the world's population is overweight, and half of these are obese. In Brazil, an estimated 15% of the population is obese, and 1 to 2% of adults (1.5 million people) are morbidly obese, accounting for about 10% of expenditures by the public-health services (GELONEZE e PAREJA, 2008).

Similar estimates for obesity rates in Brazil were given by the World Health Organization for the years 2000 to 2007: 8.9% of women and 13.1% of men over 15 years of age. During the same period, 7.3% of Brazilian children younger than 5 years were considered overweight (WHO, 2009).

Obesity causes many psychological and social problems, and increases the occurrence of several chronic diseases of which the most frequent are diabetes mellitus, hypertension, and osteoarticular and pulmonary dysfunction, impairing the quality of life of obese individuals, and increasing morbidity and mortality. The impact of morbid obesity is even greater (VALEZI et al., 2004).

About 10 to 40% of individuals with a BMI (body mass index) between 30 to 39 kg/m2 lose over 10% of body weight with clinical treatments, including medications, diet, and exercise, but the difficulty is to maintain the lower weight (LIMA et al, 2006). The results are even more disappointing for morbid obesity (GELONEZE e PAREJA, 2008; BEARD, BELL e DUFTY, 2008 WAX et al., 2007; LIMA et al., 2006). The WHO defines morbid obesity as a BMI of 40 kg/m2 or higher, which increases the risk of comorbidities (WHO, 1998). It represents an imminent risk to life and should be treated surgically, since more-conservative treatments have proved ineffective (MONACO et al., 2006). Bariatric surgery has emerged as a therapeutic option in the treatment of morbid obesity, and is effective in the short and long terms not only for weight loss, but also for the improvement and resolution of comorbidities (LIMA et al., 2006). For morbidly obese patients, surgical treatment is the best option for weight loss, and principally for maintenance of the lower weight (WHO, 1998). The weight loss of more than 60% after bariatric surgery constitutes an important treatment for morbid obesity that is refractory to standard medical therapy BEARD, BELL e DUFTY, 2008; WAX et al., 2007).

Patients with a BMI over 40 kg/m2, or with a BMI between 35 and 39.9 kg/m2 and obesity-associated comorbidity are candidates for surgical treatment (NIH, 1992). The present study profiled patients undergoing bariatric surgery in Maringá, Paraná, Brazil from 1999 through 2008.

METHODS

This descriptive and retrospective study in Maringá included all patients undergoing bariatric surgery from 1999 through 2008. The data were collected in a teaching hospital, two private hospitals, and a private charity hospital.

The BMI data were obtained from weight and height listed in hospital records, calculated by the formula BMI = weight (kg) / height2 (m2). The sole criterion for definition of comorbidities was their notation in the patients' records.

For the analysis we used a descriptive method and nonparametric techniques, using the software R version 2.7.0 (2008-04-22). The Chi-Square Homogeneity and Fisher's Exact tests were used, with the significance level at $p < 0.05$.

After authorization from the participating institutions, the study was approved by the Ethics Committee of the Universidade Estadual de Maringá (Report no. 494/2008).

RESULTS

From 1999 through 2008, a total of 1916 patients underwent this surgery, 1461 (76.24%) females and 455 (23.76%) males. Most were Caucasian (1544, 96.56%), and 55 (3.44%) were black or mixed race. 1130 (61.11%) of the patients had partners and 719 (38.89%) did not. 896 (47.84%) of the patients were from Maringá, 260 (13.88%) from other cities in the Maringá Regional Health Area, and 717 (38.28%) from other cities outside this area. Most (90.74%) of the surgeries were performed by the same surgeon.

Table 1. Demographics, pre-surgery body mass index (BMI), and hospitalization records of patients undergoing bariatric surgery from January 1999 through December 2008, in Maringá, Paraná, Brazil.

Variables	N	Mean/ Standard Deviation
Women	1461	
Age		37.05 ± 11.50 (13-70)**
Pre-surgery weight		114.57 ± 19.88 (69-210)
Pre-surgery BMI*		44.80 ± 6.95 (29.86-75.28)
Men	455	
Age		34.23 ± 12.04 (15-84)
Pre-surgery weight		144.22 ± 22.88 (91.10-239)
Pre-surgery BMI*		47.37 ± 7.38 (36.84-80.79)
Surgery time (min)	1916	225.42 ± 73.44 (75-660)
Days in hospital	1916	4.11± 2.98 (1-65)
Days in ICU	251	2.13 ± 2.16 (1-21)

*Body Mass Index ** Minimum and Maximum in parentheses

Table 2. Complications, hospitalization in ICU, evolution, and forms of payment of patients undergoing bariatric

surgery from January 1999 through December 2008, in Maringá, Paraná, Brazil.

Variables		Patients N (%)
Surgical Complications n=1836	Incisional/surgical	9 (0.49)
	Urinary	1 (0.05)
	Pulmonary	12 (1.09)
	Infections	2 (0.11)
	Hemorrhagic	1 (0.05)
	Anesthesia-related	8 (0.44)
	Others	9 (0.49)
	None	1794 (97.71)
Hospitalization in ICU n=1833	Yes	251 (13.69)
	No	1582 (86.31)
Evolution n=1888	Discharge	1881 (99.63)
	Death	7 (0.37)
Form of payment n=1862	Plans	1078 (57.89)
	Private	601 (32.28)
	Public Health Service	183 (9.83)

Table 3. Incidence of comorbidities among 1,897 patients undergoing bariatric surgery from January 1999 through December 2008 in Maringá, Paraná.

Comorbidities	Yes	Percentage	No	Percentage
Hypertension	318	16.76%	1.579	83.24%
Dyslipidemia	32	1.69%	1.865	98.31%
Apnea	14	0.74%	1.883	99.26%
Arthralgia	28	1.48%	1.869	98.52%
Diabetes	90	4.74%	1.807	95.26%
Vascular Pathologies	26	1.37%	1.871	98.63%
Dyspnoea	58	3.06%	1.839	96.94%

No data available for 19 patients.

The results of Fisher's Exact Test indicated associations between obesity and the following comorbidities: apnea (p= <0.04), arthralgia (p= 0.0336), vascular diseases (p= 0.0029), and dyspnoea (p= 0.0079). No associations were found between obesity and hypertension (p= 0.2624), diabetes (p= 0.5573), or dyslipidemia (p= 0.6210).

DISCUSSION

Although bariatric surgery has been performed since the 1950s, only in the last two decades has it become a safe and successful procedure. With the increasing number of surgeries, several complications have made it extremely important to identify and define the predictors of risk related to morbidity and mortality for this procedure (JONES, 2004).

From 1974 to 2003, the number of morbidly obese adults in southern Brazil increased by 120%. Although obesity is more common among women, during this period, morbid obesity increased by 700% in men versus 197% in women (OLIVEIRA, 2007).

A study of 21 years of surgeries carried out in São Paulo city found a mean age of 37 years (ranging from 12 to 71), the same mean found in this study (GARRIDO JUNIOR, 2000). Other investigators in Porto Alegre, Rio Grande do Sul found a mean of 37.3 years (18-61) (ROCKENBACH, 2007).

The higher incidence of morbid obesity is aged to 46 to 55, where 5% of the population is morbidly obese. The between 56 to 65 years of age, reaches 10% of the population (SBCBM, 2007).

These data show that overweight and obesity affect young people in their productive and reproductive years. This time of life is optimum for surgeries, because there is no contraindication due to age, and because of the influence of the need for body acceptance for aesthetic reasons.

In this study, the proportion of women undergoing bariatric surgery (76.24%) was higher than that found in a study in the city of São Paulo (59%) (GARRIDO JUNIOR, 2000) and similar to the city of Londrina, Paraná, where 75.6% of the patients were female, with a mean age of 41 years (VALEZI et al.,2004).

Several factors may explain the predominance of women, such as the greater prevalence of obesity in females, and the greater likelihood that women will seek treatment, as also observed elsewhere in Brazil (BUCHWALD et al., 2004).

Média de idade superior à encontrada nesta pesquisa foi descrita num estudo realizado no departamento de cirurgia de um hospital credenciado pelo SUS em São Paulo (48,6 anos), sendo 89,21% o percentual das cirurgias efetuadas em mulheres e de 17,90% o daquelas efetuadas em homens (OLIVEIRA, 2007).

Several studies on bariatric surgery have described the prevalence of these operations in Caucasian patients (COSTA et al., 2009; GARRIDO JUNIOR, 2000). In the state of Mato Grosso do Sul, Brazil, the prevalence of Caucasian ethnicity was 86.53% (COSTA et al, 2009), similar to this study (96.56% Caucasians).

The prevalence of Caucasian patients accords with the general population: data from the 2000 Census (IBGE, Brazilian Institute of Geography and Statistics) indicated that 53.74% of the country's population is Caucasian. In southern Brazil, data from 2003 showed that 82% of the population is Caucasian and 17% mixed-race (IBGE, 2000).

The rate of obesity in Brazil is higher among separated couples (4.5%). It reaches 18% of the separated population in the southern region of the country (SMCBM, 2007).

The mean weight of women undergoing bariatric surgery in this study was 114 kg with a BMI of 44.80 kg/m2; and 144 kg for men, with a mean BMI of 47.37 kg/m2. These indices were lower than in São Paulo, where the mean was 156 kg and BMI of 60 kg/m2, ranging from 37 to 93 (GARRIDO JUNIOR, 2000); and similar to other studies4 that found BMIs of 46 kg/m2 (VALEZI et al., 2004) and 46.8 kg/m2 (BUCHWALD et al., 2004). In Rio Grande do Sul, the mean weight was higher than in this study, 132.9 kg and BMI 43.3 kg/m2 (37.1-82) (ROCKENBACH, 2007). In São Paulo with 133 kg (92,5-214) and BMI médio de 48,7kg/m2 (OLIVEIRA, 2007). These data revealed the prevalence of subjects with class III obesity, a highly serious condition.

In bariatric surgeries in Brazil, a mean of 6.9 days of hospitalization were required in 10,365 procedures performed

between 1999 and 2006; and in the southern region, the mean hospitalization time was 7.2 days in a total sample of 3127 surgeries (OLIVEIRA, 2007), both longer than the 4 days of hospitalization found in this study. Similar data were reported in a study on patients with morbid obesity who underwent gastroplasty, and remained in the hospital about 3.5 ± 1.6 days (FARIA et al., 2002). However, 13.69% of these patients required care in the ICU, in comparison to 4.7% of patients in southern Brazil (OLIVEIRA, 2007).

The complications described in a study conducted in São Paulo (incisional 32.3%, urinary 5%, pulmonary 10.1%, and intraperitoneal complications 3.3%) were similar to those found in the patients of this study, but the percentages were lower (Table 2). Mortality due to these complications was 1% among the patients in São Paulo (GARRIDO JUNIOR, 2000). The mean BMI of patients in this study was lower, and the comorbidity rates were also lower, which may explain these differences.

In the present study, the mortality rate (0.37%) was much lower than rates reported in Minas Gerais (4.1%) (DINIZ et al., 2008) and São Paulo (below 2%) (GARRIDO JUNIOR, 2000). However, a more detailed comparison of the patient populations is impossible because in this study, the obesity classification was described for only 316 patients. This is an important factor in assessing the risk of surgery.

The occurrence of comorbidities associated with obesity in patients in this study was much lower than found elsewhere. For example, authors11 described the occurrence of dyspnoea in 65% of patients, arthropathy in 47%, arterial hypertension in 29%, diabetes in 16%, sleep apnea in 10%, and lower varicose veins in 9.5% (GARRIDO JUNIOR, 2000). Dyspnoea was reported in 11.2% of the patients in a study in the city of Londrina, Paraná (VALEZI et al., 2004).

We found no association between hypertension and obesity. However, another study (FORMIGUEIRA e CANTON, 2004) reported a positive association between BMI and hypertension: women with BMI> 30 kg/m2 had a four times higher risk of hypertension compared to those with a BMI of 21 kg/m2. In concordance with other studies that found a significant association between the degree of obesity and the existence of comorbidities (DINIZ et al., 2008).

Unlike others authors, in another study found an association between obesity and the following comorbidities: apnea, arthralgia, vascular disease, and dyspnoea (DINIZ et al., 2008).

CONCLUSIONS

In recent years, peoples' lifestyles have changed considerably, with, among other consequences, reduced energy consumption due to a sedentary lifestyle and excessive weight gain due to inappropriate diet. These changes have resulted in overweight and obesity, now a worldwide concern. Morbid obesity is a severe condition, usually accompanied by multiple comorbid conditions that limit the quality and life expectancy of patients, who are usually young. Bariatric surgery can contribute to the reduction of weight of these patients, with few complications and a low mortality rate, as described here.

The follow-up of these patients is of fundamental importance to ensure the proper sequence in the nutritional treatment, to prevent late complications, and to monitor the evolution of these patients in relation to weight loss, long-term maintenance, nutritional assessment, and the surgical impact of weight loss, resolution of comorbidities, and to detect changes in their quality of life.

Most patients who underwent this treatment were women, which explains the present concerns regarding contraception, reproduction and pregnancy.

In the course of collecting the data, we noted inadequacies in hospital records. Complete and detailed information was available only in the records maintained in the teaching hospital, which constituted a limitation for this study.

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TEN YEARS OF EXPERIENCE WITH BARIATRIC SURGERY IN SOUTHERN BRAZIL.

ABSTRACT

Objective. This study profiled the patients undergoing bariatric surgery in the municipality of Maringá, state of Paraná, Brazil. Methods. This descriptive, retrospective, and cohort study that studied patients who underwent bariatric surgery in Maringa from 1999 through 2008. Results. The study evaluated 1916 surgeries, of which 76.24% were in women. The body mass index (BMI) was 44.80 ± 6.95 in females and 47.37 ± 7.38 in males; the mean age was 37.05 ± 11.50 years in females and 34.23 ± 12.04 years in males; most were Caucasian (96.56%), and most (61.11%) had a partner (a); 47.84% resided in the city of Maringá; 97.71% of the cases presented no surgical complications; 251 patients (13.69%) were hospitalized in intensive-care units (ICU); and only seven (0.37%) died. The most frequent reported comorbidities were hypertension (16.76%) and diabetes (4.74%). Obesity was significantly associated with the comorbidities: apnea, arthralgia, vascular diseases, and dyspnoea. Conclusions. The bariatric surgeries presented few complications and a low mortality rate, and were considered safe, confirming the results of other studies.

KEYWORDS: Obesity. Treatment. Surgery.

10 ANS DE CHIRURGIE BARIATRIQUE EXPÉRIENCE DANS LE SUD DU BRÉSIL

RESUMÉ

Objectif. Décrire Le profil des patients subissant une chirurgie bariatrique à Maringá, Paraná, Brésil. Méthodes. Un étude descriptive, de cohorte rétrospective qui a étudié 1916 patients ayant subi une chirurgie dans l'étude à Maringá, de 1999 à 2008. Résultats. La majorité étaient des femmes (76,24%). L'indice de masse corporelle était 44,80kg/m2 pour les femmes et 47,37 kg/m2 chez les hommes, l'âge moyen était de 37,05± 11.50 années pour les femmes et 34,23 années pour les hommes, la plupart a été blanc et avait un partenaire, dans 97,71% n'avaient pas le complications chirurgicales; 13,69% des patients ont été hospitalisés dans les unités de soins intensifs, et sept sont mortes. Les comorbidités les plus fréquemment rapportés étaient l'hypertension et le diabète. Il y avait une association entre l'obésité et co-morbidités: l'apnée du sommeil, douleurs articulaires, les maladies vasculaires et de la dyspnée. Conclusions. La chirurgie bariatrique a peu de complications et de faible taux de mortalité est considérée comme sûre,confirmant les résultats d'autres études.

MOTS-CLÉS: obésité. Traitement. Chirurgie.

DIEZ AÑOS DE EXPERIENCIA CON LA CIRURGIA BARIATRICA DEL SUR DE BRASIL.

RESUMEN

Objetivo. Describir el perfil de los pacientes sometidos a cirugía bariátrica en el município de Maringá, estado do Paraná, Brasil. Métodos. Estúdio descriptivo, retrospectivo, de cohorte que estúdio 1916 pacientes sometidos a cirugía en Maringá entre 1999 y 2008. Resultados. el estúdio evaluó 1916 cirugías, de las cuales 76,24% correspondieran a mujeres. El índice de masa corporal fue 44,80 ± 6,95 en las mujeres y 47,37 ± 7,38 en los varones, la edad media fue de 37,05 ± 11,50 años en mujeres y 34,23 ± 12,04 años en los hombres, la mayoría eran de raza blanca (96,56%), y la mayoría (61,11 %) tenía un socio (a), 47,84% residían en la ciudad de Maringá, 97.71% de los casos no presentaron complicaciones quirúrgicas, 251 pacientes (13.69%) fueron hospitalizados en unidades de cuidados intensivos (UCI), y sólo siete (0,37)% falleció. Las comorbilidades más frecuentes fueron la hipertensión arterial (16,76%) y diabetes (4,74%). La obesidad se asoció significativamente con las comorbilidades: apnea, artralgias, enfermedades vasculares, y disnea. Conclusiones. La cirugía bariátrica presenta pocas complicaciones y una tasa de mortalidad baja, y se considera seguro, lo que confirma los resultados de otros estudios.

PALABRAS CLAVE: Obesidad. El tratamiento. La cirugía.

10 ANOS DE EXPERIÊNCIA DE CIRURGIA BARIÁTRICA NO SUL DO BRASIL

RESUMO

Objetivo: Descrever o perfil de pacientes submetidos à cirurgia bariátrica no município de Maringá, Paraná, Brasil. Métodos: Estudo descritivo, retrospectivo e de coorte que estudou 1916 pacientes submetidos à cirurgia em Maringá, de 1999 a 2008. Resultados: A maioria era do sexo feminino (76,24%). O índice de massa corporal foi 44,80 Kg/m2 no sexo feminino e 47,37 Kg/m2 no sexo masculino, a idade média foi de 37,05 anos nas mulheres e 34,23 anos nos homens; a maioria era da raça branca e tinha um parceiro; em 97,71% não houve complicações cirúrgicas; 13,69% dos pacientes foram internados em unidades de terapia intensiva, e sete morreram. As comorbidades mais relatadas foram: hipertensão e diabetes. Houve associação da obesidade com as co-morbidades: apnéia, artralgias, doenças vasculares e dispneia. Conclusões: A cirurgia bariátrica apresentou poucas complicações e baixa taxa de mortalidade sendo considerada segura, confirmando os resultados de outros estudos.

PALAVRAS-CHAVE: Obesidade. Tratamento. Cirurgia.