Original article

Prevalence of fibromyalgia in patients treated at the bariatric surgery outpatient clinic of Hospital de Clínicas do Paraná - Curitiba

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ABSTRACT

Introduction: Fibromyalgia (FM) is a chronic pain syndrome characterized by generalized pain. It is known that obese patients have more skeletal muscle pain and physical dysfunction than normal weight patients. Therefore, it is important that the early diagnosis of FM be attained in obese patients.

Objective: To determine the prevalence of FM in a group of obese patients with indication of bariatric surgery.

Materials and methods: The patients were recruited from the Bariatric Surgery outpatient clinic of Hospital de Clínicas of UFPR (HC-UFPR) before being submitted to surgery. Patient assessment consisted in verifying the presence or absence of FM using the 1990 and 2011 ACR criteria, as well as the presence of comorbidities.

Results: 98 patients were evaluated, of which 84 were females. The mean age was 42.07 years and the BMI was 45.39. The prevalence of FM was 34% ($n = 29$) according to the 1990 criteria and 45% ($n = 38$) according to the 2011 criteria. There was no difference in age, BMI, Epworth score and prevalence of other diseases among patients who met or not the 1990 criteria. Only depression was more common in patients with FM. (24.14% vs. 5.45%). The same findings were seen in patients that met the 2011 criteria.

Conclusions: The prevalence of FM in patients with morbid obesity is extremely high. However, BMI does not differ in patients with or without FM. The presence of depression may be a risk factor for the development of FM in these patients.

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Prevalência de fibromialgia em pacientes acompanhados no ambulatório de cirurgia bariátrica do Hospital de Clínicas do Paraná - Curitiba

R E S U M O

Palavras-chave:
Fibromialgia
Obesidade
Depressão

Introdução: Fibromialgia (FM) é uma síndrome de dor crônica caracterizada por dor generalizada. Sabe-se que pacientes obesos têm mais dor músculo esquelética e disfunção física do que pacientes de peso normal. Portanto, é importante que o diagnóstico precoce da FM seja feito em pacientes obesos.

Objetivo: Determinar a prevalência de FM em um grupo de pacientes obesos com indicação de cirurgia bariátrica.

Materiais e métodos: Os pacientes foram captados do ambulatório de Cirurgia Bariátrica do Hospital de Clínicas da UFPR (HC-UFPR), antes de serem submetidos à cirurgia. A avaliação dos pacientes consistia em constatar a presença ou ausência de FMG pelos critérios ACR 1990 e 2011 e também a presença de comorbidades.

Resultados: Foram avaliados 98 pacientes, 84 mulheres. A idade média foi de 42,07 anos e o IMC de 45,39. A prevalência de FM foi de 34% (n = 29) pelos critérios de 1990 e de 45% (n = 38) pelos de 2011. Não houve diferença em idade, IMC, escala de Epworth e prevalência de outras doenças entre pacientes que preenchiam ou não os critérios de 1990. Apenas depressão foi mais comum nas pacientes com FM (24,14% vs. 5,45%). Os mesmos achados foram vistos nas pacientes que preenchiam os critérios de 2011.

Conclusões: A prevalência de FM em pacientes com obesidade mórbida é extremamente alta. Porém o IMC não difere nos pacientes com ou sem FM. A presença de depressão pode ser um fator de risco para o desenvolvimento de FM nesses pacientes.

Introduction

Fibromyalgia (FM) is a chronic pain syndrome characterized by widespread pain, muscle pain at palpation, and other associated symptoms, such as fatigue, morning stiffness, non-restorative sleep and cognitive symptoms.[1]

In 1990, the American College of Rheumatology (ACR) developed FM classification criteria based on the presence of widespread pain, plus pain upon palpation in at least 11 of 18 predefined points (tender points). Widespread pain is defined as axial pain, pain in both sides of the body, as well as in the upper and lower segments. In 2010, the ACR developed preliminary diagnostic criteria for FM. In this new set of criteria, the Widespread Pain Index (WPI) score is used, plus the Symptom Severity Score (SSS). Patients with WPI ≥ 7 and SSS ≥ 5 or WPI of 3–6 and SSS ≥ 9 are diagnosed with fibromyalgia. In this new criterion the score of tender points is not considered, and they were modified in 2011 for a more practical use.[2,3]

It is known that obese patients have more skeletal muscle pain and physical dysfunction than normal weight patients and that obesity is associated with certain rheumatic conditions, such as knee osteoarthritis (OA), carpal tunnel syndrome and low back pain.[4]

There are possible mechanisms by which fibromyalgia and obesity interrelate. Patients with FM are overweight or obese in most studies, and these conditions can worsen the painful clinical picture. This may be due to several factors, including obstructive sleep apnea syndrome, other sleep disorders, depression, thyroid dysfunction and cytokine profile.[5]

Additionally, there is a study with patients submitted to bariatric surgery, who, after weight loss showed significant improvement or even resolution of FM.[6]

Knowing that there is an association between these conditions, it is important to attain an early diagnosis of FM in obese patients, to achieve an adequate treatment and quality of life improvement of these patients. This study aims to verify the presence of fibromyalgia in a population treated in a bariatric surgery outpatient clinic, before the surgical procedure. The prevalence of FM was verified through the use of the 1990 criteria and the 2010 criteria modified by Wolfe.

Materials and methods

Study design

Cross-sectional study on the prevalence of fibromyalgia in obese patients with indication for bariatric surgery.

Patients

The patients were recruited from the Bariatric Surgery outpatient clinic of Hospital de Clínicas of UFPR (HC-UFPR). One hundred patients were evaluated from 03/19/2012 to 12/09/2013 and all provided the written informed consent form (ICF).

The inclusion criteria consisted of all patients in the outpatient clinic who provided (ICF) and were aged between 18 and 65 years of age. Patients that did not meet these parameters were excluded.

Patients were evaluated regarding age, gender, weight, height, BMI, and presence of comorbidities through medical record analysis. The evaluation of comorbidities was also carried out through a questionnaire and by directly asking the patient what other diseases were present and what medications were used.

FM diagnosis

Patient evaluation consisted in verifying the presence or absence of FM according to both the 1990 and the modified 2010 ACR criteria. Patients were asked about the presence of widespread pain and in affirmative cases, how long the pain had been present. All patients were evaluated for the presence of tender points. If there were 11 or more than 18 positive tender points, the patient was classified with FM according to the 1990 criteria.

We also evaluated the Widespread Pain Index (WPI), which can range from 0 to 19 depending on the number of painful areas, as well as the Symptom Severity Score (SSS), which evaluates fatigue, repairing sleep and cognitive symptoms. For each of these items the degree of severity can vary from 0 to 3, where 0 = it is not a problem; 1 = slight, occasional; 2 = moderate, present almost always; 3 = severe, persistent, major problems. Somatic symptoms were also evaluated, but in a simplified way. The patient was questioned about headaches, abdominal pain and depression, which were scored from 0 to 3, with 0 = none of the three problems; 1 = one symptom; 2 = two symptoms and 3 = three symptoms. The final SSS ranges from 0 to 12. The sum of the Widespread Pain Index (WPI) with the Symptom Severity Score (SSS) generates a new index to evaluate FM, called fibromyalgianess scale, which would be the disease intensity dimension.

By using the WPI together with the SSS, one has the items used to evaluate the diagnosis of FM through the 2010 ACR criteria. Patients are diagnosed with FM when the WPI is ≥ 7 associated with SSS ≥ 5. When pain is not the most affected domain in the syndrome, the diagnosis is also possible, since the number of general symptoms is greater, that is, with a WPI of 3–6 associated with SSS ≥ 9 the patient is also diagnosed with FM. In addition to the scores, in order to complete the diagnostic criteria, the patient must have had the condition for the last three months and no other clinical picture that justifies the widespread pain.

The FM-specific questionnaire, Fibromyalgia Impact Questionnaire (FIQ), which has been validated for Portuguese, was also applied to all patients.[7,8] This item analyzes the frequency at which patients can perform certain tasks, how many days they felt well in the previous week, work absenteeism and, using scales ranging from 0 to 10, assesses pain, tiredness, depression, non-repairing sleep, among others. The FIQ ranges from 0 to 100 and the higher the number, the greater the impact of fibromyalgia.

Sleep evaluation

In addition to the criteria for FM, we evaluated the Epworth scale as a substitute for sleep assessment. The patient answers about the chance of napping while performing certain tasks according to a scale of 0–3, 0 = would never doze, 1 = slight chance of dozing, 2 = moderate chance of dozing, 3 = high chance of dozing. In cases where the patient reaches 10 points or more, the chance of having sleep disorders and/or sleep apnea is greater. The specific diagnosis of sleep disorders in patients with a score ≥ 10 points goes beyond the objective of this study.

Statistical analysis

The statistical analysis was carried out using the software JMP 7.0 (SAS, USA). For comparison of means, the student's t test was used for parametric data and Wilcoxon–Mann for non-parametric data. For the correlations, Pearson's test was used for parametric data and Spearman's test for non-parametric data. The chi-square test was used for proportions.

Results

One hundred patients were consecutively assessed and completed the questionnaires; however, two patients were excluded, as it was not possible to review their medical records. The final analysis consisted of 98 patients, 84 (85.7%) women and 14 (14.3%) men.

As for the initial assessed characteristics, BMI and age, there was no statistical difference between obese patients with and without fibromyalgia. The mean age of women was 42.07 years and the mean BMI was 45.39.

When analyzing the subgroup of women ($n = 84$) using the 1990 criteria, 29 patients had FM (34% CI 25–45), while according to the 2010 criteria, 38 patients had FM (45% CI 35–55); 26 patients had FM by both criteria (26.2%).

Of the 29 patients who met the 1990 criteria, only nine (31.03%) had a diagnosis prior to this study. There was no difference in age, BMI, Epworth score, and prevalence of other diseases in patients that met the 1990 criteria. Only depression was more common in patients with FM (24.14% vs. 5.45%) (Table 1). Significantly higher values of the FIQ and fibromylgianess index were observed in female patients with FM in comparison to those with no FM, confirming the usefulness of these methods in the evaluation of patients with FM (35.48 ± 3.14 vs. 60.98 ± 4.33 for FIQ and 10 ± 0.8 vs. 20 ± 1.1 for fibromyalgianess in patients without and with FM, respectively).

The same findings were seen in patients who met the 2011 criteria (Table 2). Regarding the diagnosis of FM by the 2011 criteria, only 13.16% of the patients had been previously diagnosed.

Table 3 shows the correlation analysis separately, depending on the criterion used for diagnosis. In the group that met the 1990 criteria, BMI did not correlate with FM-related indexes, such as the number of tender points, the FIQ, and the fibromyalgianess index. When the age of the patients with FM was analyzed, there was a positive correlation with the WPI ($r = 0.30$, $p = 0.05$) and the fibromyalgianess index ($r = 0.35$, $p = 0.03$). These correlations were similar regardless of the criteria used for FM diagnosis.

Regarding the FM indexes, there was a correlation between FIQ and fibromyalgianess ($r = 0.33$, $p = 0.03$), FIQ and SSS ($r = 0.6$, $p = 0.0001$) in patients diagnosed using the 2011

Table 1 – Analysis of female patients with and without Fibromyalgia according to the 1990 criteria.

	Without FM 1990 (n = 55; 65.5%) Mean ± SD	With FM 1990 (n = 29; 34.5%) Mean ± SD	p-Value
BMI	45.28 ± 1.2	45.45 ± 0.93	NS
Age	44 ± 2.28	41.01 ± 1.65	NS
FIQ	35.48 ± 3.14	60.98 ± 4.33	0.0001
Fibromyalgianess	10 ± 0.8	20 ± 1.1	0.001
Epworth Scale	4.81 ± 4.15	6.17 ± 5.15	NS
	%	%	
Hypertension	54.55	44.83	NS
Diabetes mellitus	66.67	33.33	NS
Hypothyroidism	25.45	27.59	NS
Sleep apnea	14.55	24.14	NS
Dyslipidemia	29.09	10.34	0.04 (OR: 0.28 CI 0.07–1.06)
Depression	5.45	24.14	0.02 (OR: 5.51 CI 1.30–23.31)

BMI, body mass index (kg/m^2); FIQ, Fibromyalgia Impact Questionnaire; SD, standard deviation.

Table 2 – Analysis of female patients with and without fibromyalgia according to the 2011 criteria.

	Without FM 2011 (n = 46. 55%) Mean ± SD	With FM 2011 (n = 38. 45%) Mean ± SD	p-Value
BMI	40.76 ± 12.16	43.65 ± 12.44	NS
Age	44.27 ± 7.1	46.75 ± 6.5	NS
FIQ	26.31 ± 17.06	66.05 ± 16.53	<0.0001
Fibromyalgianess	8.5 ± 4.9	20.02 ± 4.65	<0.0001
	%	%	
Hypertension	54.35	55.26	NS
Diabetes mellitus	32.61	39.47	NS
Hypothyroidism	28.26	23.68	NS
Sleep apnea	13.04	23.68	NS
Dyslipidemia	30.43	13.16	0.05 (OR: 0.34 IC: 0.11–1.07)
Depression	6.52	18.42	0.09 (OR: 3.32 IC: 0.77–13.51)

BMI, body mass index (kg/m^2); FIQ, Fibromyalgia Impact Questionnaire; SD, standard deviation.

Table 3 – Analysis of correlations between study variables, only in female patients.

		BMI	Age	FIQ	Fibromyalgianess	WPI
Tender points	1990	§	§	§	§	0.31 (p = 0.08)
	2011	§	§	§	0.37 (p 0.013)	0.48 (p = 0.001)
WPI	1990	§	0.37(p 0.04)	§	§	na
	2011	§	0.3 (p 0.04)	§	§	na
SSS	1990	§	Na	0.78 (p < 0.0001)	na	na
	2011	§	Na	0.6 (p < 0.001)	na	na
Fibromyalgianess	1990	§	0.33 (p 0.06)	0.59 (p 0.004)	–	na
	2011	§	0.36 (p 0.0017)	0.33 (p 0.03)	–	na
FIQ	1990	§	§	–	–	na
	2011	§	§	–	–	na
Apnea	1990[a]	§	§	0.36 (p 0.08)	na	na
	2011[b]	§	§	§	na	na

BMI, body mass index (kg/m^2); FIQ, Fibromyalgia Impact Questionnaire; p, p value; §, no correlation; na, not assessed.

[a] Only 24 patients assessed.
[b] Only 36 patients assessed.

criteria. According to the 1990 criteria, these correlations were stronger. We found an association between FIQ and Epworth index only in patients who met the 1990 criteria.

The fibromyalgianess index also showed a correlation with the tender points, but only in the patients who met the 2011 criteria. The tender points, in turn, showed a correlation with the WPI in both criteria.

Twenty-six patients met both the 1990 and the 2011 criteria (Table 4). In this subgroup, the correlation analysis between variables showed a positive correlation between age and WPI and age and fibromyalgianess. The FIQ showed a high positive correlation with the SSS and a positive one with fibromyalgianess. The latter, in turn, showed a positive correlation with tender points and these showed a correlation with WPI.

Table 4 – Analysis of correlations between study variables in patients who met both criteria (1990 and 2011).

	BMI	Age	FIQ	Fibromyalgianess	WPI
Tender points	§	§	§	0.37 ($p = 0.059$)	0.48 ($p = 0.014$)
WPI	§	0.38 ($p = 0.05$)	§	na	–
SSS	§	§	0.65 ($p = 0.0003$)	na	§
Fibromyalgianess	§	0.41 ($p = 0.04$)	0.39 ($p = 0.05$)	–	na
FIQ	§	§	–	0.39 ($p = 0.045$)	§
Apnea	§	§	§	§	§

BMI, body mass index (kg/m^2); FIQ, Fibromyalgia Impact Questionnaire; p, p value; §, no correlation; na, not assessed.

Of the 14 men in this study, seven had FM (50%), three of them according to the 1990 criteria and four by the 2011 criteria. The characteristics between men and women did not vary in this study regardless of the criteria used for diagnosis.

Discussion

The prevalence of FM in Brazil is estimated at 2.5%.[9] It is more common in women, affecting approximately 3.4% of women and 0.5% of men.[10]

There is a clear association between fibromyalgia and obesity, but the mechanisms of such association are not well established yet. One cannot affirm whether obesity is the cause or the consequence of fibromyalgia, or if the two diseases have similar pathophysiological mechanisms. Among the mechanisms proposed to explain this association are impaired physical activity, cognitive and sleep disorders, depression and other psychiatric comorbidities, thyroid and neuroendocrine axis dysfunction and endogenous opioid system disorder.[5]

In the population with fibromyalgia, the prevalence of obesity and overweight is approximately 32–50% and 21–35% respectively.[5,11–13] In contrast, in a population of obese individuals, the prevalence of FM is not as well documented, ranging from 5.15% to 27.7%.[6,14] We found a prevalence of FM between 34 and 45%, depending on the criteria used, thus, well above what has been reported in the literature.[14]

We found no association between FM and BMI, regardless of the criteria used. However, due to the association between FM and obesity, we expected patients with FM to have a higher BMI, which was not confirmed in this study. These data are compatible with those by Arreghini et al., 2014, which to the best of our knowledge is the only published study with a similar study design and that tested this hypothesis. However, in the report by Cordero et al., 2014, which evaluated obesity in patients with FM, there was a weak correlation between BMI and tender points. Additionally, studies that assessed FM before and after weight loss show that weight loss has an impact on pain indexes. Therefore, the fact that we found no association between weight and FM may be due to the study design, as we started with a group of obese patients, not patients with FM.

Regarding the comorbidities, we found a higher prevalence of depression among patients with FM, again, regardless of the criteria used for evaluation. The association between depression and FM is well documented.[9,15] Most FM patients also have depression, with a cumulative lifetime prevalence ranging from 62% to 86% of patients. Some of the hypotheses explaining this strong association include depression as a reaction to chronic pain and dysfunction or both being part of the same spectrum within affective disorders with central (CNS) and peripheral nervous system (PNS) disorders. Depression lowers the pain threshold and worsens physical inactivity, worsening functional limitation and impairing quality of life. Therefore, when depression is associated with FM, their joint treatment is important, sometimes with psychiatric care.[16]

There was a difference between the FIQ and fibromyalgianess indexes, with higher values among FM patients than those without FM, using both criteria. This confirms the negative impact the disease has on patients' daily lives, with a decreased pain threshold and greater functional limitation. This draws attention to the complexity of the treatment of patients with FM and obesity. If on the one hand weight loss can contribute much to pain control, FM causes the obese patient to have more depression, less motivation and resistance to physical activity. Thus, obesity management becomes a different challenge than that in obese patients without FM. For these cases, the multidisciplinary approach with patient education should include discussions regarding the association between obesity and fibromyalgia.

The positive correlation between WPI and fibromyalgianess with age can be explained by the fact that older women have a longer time of the disease, more refractoriness regarding pain management and greater impact of FM on daily life. The correlation between FIQ and fibromyalgianess confirms that both scales are useful for patient follow-up. There was an association between FIQ and the apnea scale only in the 1990 criteria.

In this study, the tender points correlated with the WPI according to both criteria, and with the fibromyalgianess index, but with the latter only in the 2011 criteria. The fact that the tender points correlate with the WPI shows that the 2011 criteria, which are simpler to apply, have a good correlation with those of 1990. The 2011 criteria can and should be used to improve FM diagnosis, especially among primary care physicians and non-specialists. However, among rheumatologists and other experienced specialists, the tender points are still very useful for diagnosis. Despite this fact, they are not useful for patient follow-up, as the sensitivity of these points may vary after treatment has been instituted, and the fact that a patient has less than 11 tender points at any given time does not necessarily mean that he or she is better or cured from FM.

Since fibromyalgianess is an FM intensity scale, consisting of the WPI and SSS, and there was an association of tender points with WPI, it is not surprising that there is also an association between fibromyalgianess and tender points. However,

we cannot explain the fact that this association is only present in patients that meet the 2011 criteria. Initially, it may seem strange to have found this association between tender points and fibromyalgianess and WPI also in patients meeting the 2011 criteria, as these are not part of this criterion. However, it should be noted that all patients were evaluated according to both criteria, so patients who only had the diagnosis by the 2011 criteria had the assessment of tender points available, making the analysis possible.

The incidence of men with FM found in this study is well above that reported in the literature. Wolfe et al. reported 0.5% of affected men, whereas in our sample we had 50% of men with fibromyalgia. Moreover, clinical experience also reinforces that the incidence of FM is not as high in men. This is possibly due to the small number of men in the sample (n = 14).

This study aimed to find the prevalence of patients with FM in a public bariatric surgery outpatient clinic. Most studies on the association between fibromyalgia and obesity have been carried out in groups of patients with FM and not in obese patients, as in the present study. Studies starting with obese patients are scarce in the literature,[6,14] but our findings showed a higher prevalence than the previously reported one.

This study has some limitations. The sample number is not large enough to allow generalizations. As there are few studies with the same design, it is still not possible to evaluate the meaning of all our findings.

In conclusion, this study showed a high prevalence of FM in obese patients with indication for bariatric surgery. Regarding the association between FM and obesity, depression was shown to be an important factor. FM brings an additional impact to the quality of life of obese patients, making their treatment an extra challenge, which certainly deserves a multidisciplinary approach.

Conflicts of interest

The authors declare no conflicts of interest.

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