BENEFITS ON HEALTH RELATED QUALITY OF LIFE AND DEPRESSION BY USING A LONG-TERM EXERCISE PROGRAM IN WOMEN WITH FIBROMIALGIA SYNDROME

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Abstract

This study aims to assess the effect of a program combined by aerobic, strengthening and flexibility exercises in patients with fibromyalgia (FM) in relation to health related quality of life and psychological health status. Fourty-two women with FM were randomly allocated to one of two groups: an experimental group that would conduct aerobic exercise, strength and flexibility exercises and a usual care control group, for 24 weeks. They were evaluated by using Short-form Health Survey (SF-36), and the psychological health status by using Beck Depression Inventory (BDI) for depression levels. Significant improvements were observed after the intervention for the combined exercise program in both quality of life (SF-36) and psychological health status (depression) and mainly in SF-36 mental health, physical function, bodily pain and vitality domain, while control group patients even experienced a decrement in some of those variables such as bodily pain. Shown results confirm that a combination of aerobic exercise, strengthening and flexibility is beneficial to improve psychological health status in patients with FM. Therefore this practice can be recommended to FM patients.

Introduction

Fibromyalgia (FM) is a common, multidimensional disorder with complex symptomatology and relatively poor treatment outcomes (Busch et al., 2008). In most patients, fibromyalgia is associated with fatigue, sleep dysfunction, stiffness, depression, anxiety, cognitive disturbance, or exercise intolerance (Wolfe et al., 1990). FM patients have shown a low health status when comparing with healthy subjects and even with patients suffering from other chronic diseases (Birtane et al., 2007). Similar results were found by Gormsen et al. (2009), who reported lower values in physical function, general health perception, vitality, social function and mental health, in FM patients than in subjects with neuropathic pain and healthy subjects of similar age. However, the relationship between FM and psychological disorders is controversial and, despite multiple studies, the results remain inconclusive (Fietta, 2007).

This complex symptomatic picture determines FM patients look for medical care and also the importance of an individualized treatment (Hoffman and Dukes, 2008). The management of this syndrome supposed the employment of both pharmacological and nonpharmacological strategies. Among the first, many authors have demonstrated the utility of antidepressants (O'Malley et al., 2000). However, many patients do not respond or cannot tolerate many of these medications. For this reason several nonpharmacological therapies have been used, including cognitive behavior therapy, education, biofeedback, and the implementation of different relaxation techniques (Rocha and Benito, 2006). In the other line, physical exercise is the nonpharmacological therapy that has shown greater benefits, either by itself or applied in combination with other treatments (Busch et al., 2008).

Many studies have reported significant improvements in the perceived health status of FM patients after physical exercise programmes, mainly based on aerobic exercise. It was reported that regular exercise results in decreased levels of depression and stress contributing to improve mental health status. In this line, numerous studies have attempted to establish basic guidelines or recommendations for the prescription of physical activity in women with FM, proving evidence of health related quality of life (HRQOL) benefits including general functioning, psychological wellbeing, and other symptoms reliefs such as in anxiety or depression (Valim et al., 2003; Gusi et al., 2006; Assis et al., 2006; Bircan et al., 2008, Tomas-Carus et al., 2008).

To date we have evidence supporting the short-term benefits of aerobic exercise in FM patients, although evidence is limited regarding the benefits of other types of training such as strength or flexibility.

Since there is a lack of evidence-based models of physical exercise to recommend these patients, the aim of this study is to assess the effects of a long-term program based on a combination of aerobic exercise, strengthening and flexibility on HRQOL and depression in women with FM.

Methods

Participants Forty-two postmenopausal women who met the ACR criteria for the diagnosis of FM (Wolfe et al., 1990), and don´t present one or more exclusion criteria: presence of inflammatory rheumatic or psychiatric diseases, respiratory or cardiac abnormalities that could interfere with the exercise and the participation in some type of physical or psychological therapy in the last 6 months, were randomized into two groups, a group that would conduct physical exercise (GA, n = 21) and a control group (CG, n = 21).

Outcome measures

The Short Form 36 (SF-36). The SF-36 is a self-administered questionnaire for measuring quality of life through the perception of health by the patient (Ware and Sherbourne, 1992). It contains 36 items grouped into 8 subscales: physical functioning, physical role, bodily pain, general health, vitality, social functioning, emotional role, and mental health. The range of scores is between 0 and 100 in every subscale, where higher scores indicate better health. The SF-36 does not obtain a global score. One item in this questionnaire measures health change during the past year in a Likert-like scale in which 1 = "much better," 2 = "better," 3 = "unchanged," 4 = "worse," and 5 = "much worse."

The Beck Depression Inventory. This is a questionnaire developed and validated for patients with depression. It contains 21 items that assess the cognitive, affective, and neuro-vegetative factors associated with depression. The range of score is 0–63, where values above 13 indicate presence of depression, and values above 21 indicate major depression (Beck et al., 1961).

Procedures

Assessment of all outcomes was undertaken at baseline and immediately after the 24-week intervention and at the same time points in the usual care control group. Exercise group patients performed twice-weekly sessions of combined exercises with 1h duration, including 10 min warm up, 10-15 min of aerobic exercise at 65-70% HR_{max}, 15-20 min of muscle training on 8 exercises (1 set of 8-10 reps with 1-3 kg) and finally 10 min of flexibility training on 8-9 exercises (1 set of 3 reps keeping the stretched position for 30 s). Control group continued their normal daily activities during the period of the intervention.

Data analysis Normality of data was initially tested using the Kolgomorov-Smirnov test. Differences between groups were tested using analyses of variance (ANOVA) for continuous variables, and the $\chi 2$ test for categorical variables. The effects of the intervention programme were evaluated by age-adjusted analyses of covariance for repeated measures. For all tests the significance level was set at $p < 0.05$. The analyses were performed using SPSS 15.0 (SPSS Inc. Chicago, USA).

Results

No significant differences between GA and CG in any of the variables considered in the study were found at baseline (Tables 1 and 2). During the intervention, three participants of the experimental group (by an accident, family problems or without cause) and a subject of CG (did not attend the evaluation session at posttest) were excluded from the study, so that data from 18 women in GA and 20 in CG were included in the analysis.

Table 1 Baseline characteristics in FM patients in pretest

Outcomes	GA (n=18)	CG (n=20)	p-valor
Age (years)	55,88 (7,14)	56,55 (8,48)	.968 (*)
Body mass (Kg)	68,49 (12,32)	74,48 (14,97)	.316 (*)
Height (m)	1,57 (0,08)	1,58 (0,07)	.793 (*)
Medicatión (n)	2,2 (0,8)	2,5 (0,7)	.642 (†)

Values showed as mean ± sd. n= drug number. *p-value (ANOVA). †p-value with $\chi 2$ analysis.

Table 2 summarizes the results of all outcomes in both groups before and after 24 weeks intervention. Significant improvements can be observed for global score of SF-36 (22%) in GA patients. These improvements were also significant for physical function, general health, vitality and mental health. With regard to psychological dimension, significant improvements were achieved by over 20% in depression (BDI). Patients in the CG did not improved in any of these variables and even some of them experienced a decrement (bodily pain). Improvements obtained for bodily pain, social function (14%) and emotional role (25%), were also remarkable when compared with those obtained in CG, but without reaching statistical significance.

Table 2. Outcome measures before and after 24 weeks intervention

	Pretest			Postest				
	GA	CG	p-value intergroup	GA	p-value intragroup	CG	p-value intragroup	p-valor intergroup
SF-36 (0-100)	39.1 (15.9)	37.7 (14.9)	0.788	47.4 (13.1)	0.007*	36.3 (16.4)	0.908	0.033*
Physical Function	50.0 (22.7)	44.6 (15.9)	0.402	57.1 (17.4)	0.027*	45.2 (13.7)	0.825	0.030*
Role Physical	13.5 (17.4)	19.8 (27.6)	0.424	21.6 (25.6)	0.321	19.4 (28.3)	0.821	0.817
Bodily Pain	23.2 (17.4)	23.6 (17.7)	0.942	30.4 (16.2)	0.041*	19.5 (17.6)	0.084	0.068
General Health	39.8 (16.1)	33.4 (12.1)	0.175	43.1 (11.4)	0.406	33.6 (11.1)	0.803	0.019*
Vitality	29.4 (15.3)	27.7 (17.5)	0.762	41.8 (11.0)	0.009*	28.4 (17.3)	0.979	0.011*
Social Function	55.2 (22.9)	48.6 (16.5)	0.313	64.4 (23.7)	0.214	52.1 (20.5)	0.473	0.109
Role Emotional	53.3 (45.3)	45.6 (40.4)	0.588	71.5 (40.1)	0.273	51.8 (43.4)	0.454	0.176
Mental Health	51.3 (18.9)	44.0 (20.7)	0.274	60.1 (15.4)	0.035*	44.0 (23.6)	0.956	0.025*
BDI (0-63)	35.1 (14.1)	31.4 (12.8)	0.173	28.7 (13.6)	<0.001*	41.5 (11.3)	0.971	0.005*

Values as mean ± sd and 95% confidence interval. GA: Exercise group; CG: Control group. *p < 0,05

Discussion

This study, based on a long-term (24 weeks) exercise program combined with aerobic exercise, strengthening and flexibility, allowed FM patients to significantly increase their general health status, measured by the total score of the SF-36, and reduces levels of depression (BDI). These results are consistent with those reported in other studies in which exercise programs were combined in women with FM, providing evidence of the effectiveness in reducing the impact of the syndrome on functional ability, but also improving health status and patients' psychological dimension. One of these studies compared a 12 weeks aerobic exercise therapy with another of flexibility, after the intervention the physical component improved in both groups, while the mental component was unchanged (Richards and Scott, 2002). Soon after, Valim et al. (2003) compared the positive effects of a program based on walking with one of flexibility. After 20 weeks of treatment, the aerobic group improved the impact of the syndrome on the patient's daily lives, mainly in mental health and depression. In another study, Assis et al. (2006) compared a water exercise program with a land-based exercise program, showing that both therapies were effective for improving pain and functional ability, although the pool exercises were more effective on the emotional component. Finally, Bircan et al. (2008), concluded that both aerobic exercise and strengthening exercises, were equally effective in improving symptoms, physical and psychological components and HRQOL in women with FM.

In the current study the role emotional scale, which assesses the patient's QOL from the perceptions of their mental health improved significantly, was significantly reduced in GA patients at the beginning of the study; however, after 24 weeks improved more than 14 points, although probably due to the enormous variability between subjects, the differences were not significant. Several authors have reflected than a higher level of emotional well-being at baseline would predict a better therapeutic response, since the presence of this syndrome could delay the benefits in personal satisfaction (Birtane et al., 2007). Significant improvements in anxiety and depression, based on interventions with aerobic or combined exercises can be expected (Redondo et al., 2004; Gusi et al., 2006; Assis et al ., 2006, Tomas-Carus et al., 2008). Previous studies showed no changes in BDI values after 8 weeks of mixed training (Redondo et al., 2004). However, longer periods of exercise results in decrements between 10-20% for depression (Häkkinen et al., 2001; Valim et al., 2003, Gowans et al., 2004; Assis et al., 2006), which include the 14% improvement achieved in this study.

It seems, in the light of these results that the positive effects of exercise on depression depend on the intensity, duration and frequency of training. In fact, correlations have been established between the amount of exercise and BDI at 12 months of exercise (Gowans et al., 2004). In this study, the exercise program was conducted in groups, improvements in depression, as well as in QOL, may be partially explained by

interactions between the women in the training sessions (Mannerkorpi and Gard, 2003).
In conclusion, the selected intensity, frequency and duration selected in the current study have showed to be safe and well tolerated by FM patients, but also effective for improving HRQOL and depression.

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