Pain and Functional Capacity in Female Fibromyalgia Patients

Ana Carbonell-Baeza, PhD,*‡§ Virginia A. Aparicio, BSc,*† Michael Sjöström, MD, PhD,§ Jonatan R. Ruiz, PhD,*§ and Manuel Delgado-Fernández, PhD*

*Department of Physical Education and Sport, School of Physical Activity and Sports Sciences; †Department of Physiology, School of Pharmacy, University of Granada; ‡Department of Physical Education and Sport, School of Education Sciences, University of Seville, Spain; §Department of Biosciences and Nutrition, Unit for Preventive Nutrition, NOVUM, Karolinska Institutet, Sweden

Reprint requests to: Ana Carbonell-Baeza, PhD, Departamento de Educación Física y Deportiva, Universidad de Granada, Carretera de Alfacar s/n, Granada 18011, Spain. Tel: +0034 958244375; Fax: +34 958 244 369; E-mail: anellba@ugr.es.

Disclosure: None.

Abstract

Objective. To examine the association between pain and functional capacity levels.

Design. Cross-sectional study.

Setting. University of Granada.

Subjects. One hundred twenty-three women with fibromyalgia (51.7 ± 7.2 years).

Outcome Measures. We measured weight and height, and body mass index (BMI) was calculated. We assessed tender points by pressure pain and functional capacity by means of the 30-second chair stand, handgrip strength, chair sit and reach, back scratch, blind flamingo, 8-ft up and go and 6-minute walk tests.

Results. We observed an association of tender points count with the chair stand and 6-minute walk tests \((r = -0.273, P = 0.004\) and \(r = -0.183, P = 0.046,\) respectively). These associations became non-significant once the analyses were adjusted by weight or BMI. We observed an association of algometer score with the back scratch, chair stand, and 6-minute walk tests \((r = 0.238, P = 0.009; r = 0.363, P < 0.001; \text{ and } r = 0.186, P = 0.043,\) respectively), which remained after adjusting for weight or BMI, except the association between algometer score and the 6-minute walk test that became nonsignificant once the analyses were adjusted by weight. Prevalence of overweight and obesity was 39.2 and 33.3%, respectively.

Conclusions. There is an inverse association of tender points count with the chair stand and distance walked in the 6-minute walk tests, and a positive association of algometer score with the chair stand, distance walked in the 6-minute walk and back scratch tests, yet, weight status seems to play a role in these associations.

Key Words. Fibromyalgia; Functional Capacity; Tender Point; Body Composition

Introduction

Fibromyalgia (FM) syndrome is a condition characterized by the concurrent existence of chronic, widespread musculoskeletal pain and multiple sites of tenderness [1]. Although a hallmark of FM is pain, FM patients are usually polysymptomatic [2]. Prominent symptoms include fatigue, stiffness, nonrestorative sleep patterns, and memory and cognitive difficulties [1,2]. In Spain, the prevalence of FM is ~2.4% [3]. The clinical manifestation of FM appears in people aged between 40 and 50, and is more common in women (~4.2%) than in men (~0.2%) [3]. The prevalence of comorbidities among patients diagnosed with FM is very high, which increases FM patients’ needs for appropriate medical management and results in higher health care resource utilization compared with patients without FM [4]. In Spain, the estimated mean total cost per patient per year is about €8,600–10,000 [5,6].

FM has an enormous impact on the health-related quality of life of patients [7,8] as symptomatology of FM limits activities of daily life as walking, and raise and transport objects [7–9]. Physical performance and functionality are decreased in people with FM [10–14] and are similar to older adults [13,15]. Jones et al. [15] observed that women with FM reported difficulties on doing tasks associated with staying physically independent. Moreover,
increase in physical impairments and problems with performing functional task of daily living reduce patients' quality of life, as well as increase the risk of falls and disability [16].

Regular physical activity is known to enhance functional capacity in FM patients and is recommended for the management of FM [17–21]. To adequately prescribe individualized exercise programs (type, duration, intensity, and frequency), it is important to know the patients' functional capacity levels [20]. Studies thoroughly describing the functional capacity of FM patients are scarce and just focused on aerobic capacity and/or muscular strength, hence data about flexibility or agility/dynamic balance levels in FM patients are needed.

Despite pain and reduced functional capacity are characteristics of FM, the association between these two parameters is not well understood. To our knowledge, one study [22] analyzed the association between lower body strength (isokinetic knee muscle strength) and tender points count, and the authors did not find significant correlations. Other studies [10,23,24] analyzed the relationship between functional capacity and pain but as measured with the fibromyalgia impact questionnaire (FIQ). With the removal of the necessity of performing the tender point examination in the new preliminary diagnostic criteria proposed for FM [25], it is important to better understand which information can be obtained when we assess tender points. Several authors have supported the need of maintaining tender point examination [26–28]. In fact, the preliminary criteria indicate that “Even though the new criteria do not include a physical examination criterion, all of the patients being diagnosed should have a physical examination, which may include examination of tender point sites” [25].

The main purpose of this study was to examine the association between pain, as assessed by means of tenderness (tender points count and algometer score), and functional capacity in female FM patients. We also thoroughly describe the functional capacity of female FM patients from southern Spain.

Method

Participants

We contacted a total of 255 Spanish female members of a FM patients association (Granada, southern Spain). A total of 130 potentially eligible female patients responded, and gave their written informed consent after receiving detailed information about the aims and study procedures. The inclusion criteria were 1) meeting the American College of Rheumatology criteria: widespread pain for more than 3 months, and pain with 4 kg/cm of pressure reported for 11 or more of 18 tender points [1] and 2) not to have other severe somatic or psychiatric disorders, or other diseases that prevent physical loading. A total of seven women did not meet these criteria and were then not included in the study.

A final sample of 123 women with FM (aged 51.8 ± 7.2 years) participated in the study. The study was approved by the Ethics Committee of the Hospital Virgen de las Nieves (Granada, Spain). The study was developed following the ethical guidelines of the Declaration of Helsinki, last modified in 2000.

Procedures

The body composition, functional capacity, and pain assessment were carried out on two separate days with at least 48 hours between each session. This was done in order to prevent fatigue and flare-ups (acute exacerbation of symptoms) in the patients.

The assessment of the tender points, blind flamingo, and chair stand test was completed on the first visit. Body composition, chair sit and reach, back scratch, 8-ft up and go, handgrip strength, and 6-minute walk tests were assessed on the second day.

Body Composition

We performed a bioelectrical impedance analysis with an eight-polar tactile-electrode impedanciometer (InBody 720, Biospace, Gateshead, UK). We measured weight (kg), and body fat (%) and skeletal muscle mass (kg) were estimated. The validity of this instrument was reported elsewhere [29,30]. Waist circumference (cm) was measured with the participant standing at the middle point between the ribs and ileac crest (Harpenden anthropometric tape, Holtain Ltd., Crymych, UK). Height (cm) was measured using a stadiometer (Seca 22, Hamburg, Germany). Body mass index (BMI) was calculated as weight (in kilograms) divided by height squared (in meters), and women were categorized using the international criteria [31] as underweight (BMI < 18.5 kg/m²), normal weight (BMI 18.5–24.9 kg/m²), overweight (BMI 25.0–29.9 kg/m²), and obese (BMI ≥ 30.0 kg/m²). The examination was conducted by a trained physical therapist.

Functional Capacity

To assess functional capacity we used the functional fitness test battery [32]. We used this tests battery because 1) it is relatively easy to administer; 2) requires minimal equipment and space; 3) the tests are safe; 4) it has almost no ceiling and floor effects (this aspect is relevant because of the heterogeneity of FM patients [33]); and 5) there are “normative scores” for healthy population [34], which makes comparisons among groups possible. Additionally, we also measured the handgrip strength and blind flamingo tests, which have also been used in FM patients [35]. The fitness test battery was administered by trained physical therapists and sport scientists. We assessed the rate of perceived exertion (RPE) after each test using the Borg’s scale [6–20] [36].

Lower body muscular strength: It was assessed by the 30-second chair stand test. We counted the number of times within 30 seconds that the participant could raise to
assessed the 18 tender points according to the American College of Rheumatology criteria for classification of FM [1]. The pain threshold at each tender point was determined by applying increasing pressure with the algometer perpendicular to the tissue. Patients were asked to say “stop” at the moment pressure became painful. The mean of two successive measurements at each tender point was used for the analysis. The algometer score was calculated as the sum of the pain-pressure values obtained for each tender point. Higher score in algometer score indicated lower pain. Tender point scored as positive when the patient noted pain at pressure of 4 kg/cm² or less. The total of such positive tender points was recorded as the individual’s tender points count. This examination was conducted by a trained physiotherapist.

Statistical Analysis

All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS, v. 15.0 for WINDOWS, SPSS Inc., Chicago, IL, USA). Data are presented as means ± standard deviation, unless otherwise stated. Centiles 10th, 25th, 50th, 75th, and 90th were calculated for all studied functional capacity tests. We analyzed the associations between tender points count, algometer score, and functional capacity by Spearman’s correlation coefficients. Additionally, we analyzed the associations of functional capacity with weight, and BMI by Spearman’s correlation coefficients and the partial correlations of tender points count and algometer score with functional capacity after adjusting by weight or BMI. The correlation values were interpreted as follows: a correlation from 0 to 0.25 indicates a weak or no relationship, a correlation from 0.25 to 0.50 indicates a fair degree of relationship, a correlation from 0.50 to 0.75 indicates a moderate-to-good relationship, while a correlation above 0.75 indicates a very good-to-excellent relationship [24,42].

Results

Four patients did not return during the second measurement day. Moreover, nine patients were not able to perform the chair sit test, and 28 did not perform the blind flamingo test because they were unable to maintain balance with eyes closed. The background of the patients is presented in Table 1.

Table 2 shows the characteristics of the study participants. One patient was overweight (0.8%), 32 (26.7%) were normal weight, 47 (39.2%) were overweight, and 40 (33.3%) were obese. Patients reported the highest value on Borg’s RPE scale after performing the 30-second blind flamingo test (15 ± 3) and the least RPE after performing the 8-ft up and go test (10 ± 2). The RPE values reported after performing the chair sit and reach and back scratch test were 12.8 ± 2.5 in both tests. The RPE values reported after performing the handgrip strength and chair stand tests were 11.9 ± 2.4 and 13.1 ± 2.7, respectively. The patients reported a mean RPE value of 13.2 ± 2.7 after performing the 6-minute walk test.

Pain and Functional Capacity in Fibromyalgia

Upper body muscular strength: It was assessed by the handgrip strength test. This test was conducted with a digital dynamometer (TKK 5101 Grip-D, Takey, Tokyo, Japan). The participants maintained the standard bipedal position during the entire test with the arm in complete extension. Each patient performed (alternately with both hands) the test twice allowing a 1-minute rest period between measures. The best value of two trials for each hand was chosen for analysis and an average score of both hands was computed. The grip position of the TKK dynamometer was adjusted to the individual’s hand size [37].

Lower body flexibility: It was assessed by the “chair sit and reach test.” The patient is seated with one leg extended, slowly bends forward sliding the hands down the extended leg in an attempt to touch (or pass) the toes. The number of centimeters short of reaching the toe (minus score) or reaching beyond it (plus score) was recorded [32]. Two trials with each leg were measured and the best value of each leg was registered, being the average of both legs used in the analysis.

Upper body flexibility: It was assessed by the “back scratch test.” This test gives an overall measure of shoulder range of motion. It measures the distance between (or overlap of) the middle fingers behind the back [32]. We measured both hands twice and the best value was registered. The average of both hands was used in the analysis.

Static balance: It was assessed by the “blind flamingo test” [38]. We recorded the number of trials needed to complete 30 seconds of the static position. The chronometer was stopped whenever the patient did not comply with the protocol conditions. One trial was accomplished for each leg and the average of both legs’ values was selected for the analysis.

Motor agility/dynamic balance: It was assessed by the 8-ft up and go test. The patient had to stand up from a chair, walk 8 ft to and around a cone, and return to the chair in the shortest possible time [32]. We recorded the best time of two trials.

Aerobic endurance: It was assessed by the 6-minute walk test. We measured the maximum distance (meters) walked by the patients in 6 minutes along a 45.7-m rectangular course [32]. The reliability of this test was reported elsewhere [39–41].

Tender Points

A standard pressure algometer (EFFEGI, FPK 20, Alfon- sine, Italy) was used to measure tender points count. We assessed the 18 tender points according to the American College of Rheumatology criteria for classification of FM [1]. The pain threshold at each tender point was determined by applying increasing pressure with the algometer perpendicular to the tissue. Patients were asked to say “stop” at the moment pressure became painful. The mean of two successive measurements at each tender point was used for the analysis. The algometer score was calculated as the sum of the pain-pressure values obtained for each tender point. Higher score in algometer score indicated lower pain. Tender point scored as positive when the patient noted pain at pressure of 4 kg/cm² or less. The total of such positive tender points was recorded as the individual’s tender points count. This examination was conducted by a trained physiotherapist.
We have observed significant correlations of weight with 6-minute walk tests performance, the higher the algometer score, and functional capacity in women with FM (r = -0.363, P = 0.0004, and r = -0.238, P = 0.009, respectively), but not with the 6-minute walk test (r = -0.238, P = 0.009), and of BMI with back scratch, static balance, and 6-minute walk tests (r = -0.564; P = 0.001; r = -0.261, P = 0.011; r = -0.0209, P = 0.023, respectively).

There were no significant correlations between tender points count and functional capacity when the correlation was adjusted by weight or BMI (data not shown).

Partial correlation analysis adjusted by weight showed correlations of algometer score with back scratch (r = 0.208, P = 0.024), chair stand (r = 0.341, P < 0.001), and 8-ft up and go tests (r = -0.238, P = 0.009), but not with the 6-minute walk test (r = 0.179, P = 0.053).

Partial correlation analysis adjusted by BMI showed correlations of algometer score with back scratch (r = 0.221, P = 0.016), chair stand (r = 0.342, P < 0.001), 8-ft up and go (r = -0.239, P = 0.009), and the 6-minute walk tests (r = 0.181, P = 0.050).

Table 3 shows percentiles for the studied tests of functional capacity in women with FM:

Individual tender point scores (pain threshold), tender points count, and algometer score are presented in Table 4. The highest and lowest mean values of pain threshold found were 2.73 and 1.72 kg/cm², respectively.

The correlations between tender points count, algometer score, and functional capacity in women with FM are shown in Table 5. The chair stand and distance walked in 6-minute walk tests were inversely correlated with tender points count, so that the higher the chair stand and the 6-minute walk test performance, the lower the tender points count in women with FM (r = -0.273, P = 0.004 and r = -0.183, P = 0.046, respectively). The back scratch test, chair stand, and distance walked in 6-minute walk tests were correlated with algometer score, so that the higher the back scratch, chair stand, and the 6-minute walk tests performance, the higher the algometer score (r = 0.238, P = 0.009; r = 0.363, P < 0.000; and r = 0.186, P = 0.043, respectively).

We have observed significant correlations of weight with the back scratch and 6-minute walk tests (r = -0.500, P < 0.001 and r = -0.217, P = 0.018, respectively), and of BMI with back scratch, static balance, and 6-minute walk tests (r = -0.564; P = 0.001; r = -0.261, P = 0.011; r = -0.0209, P = 0.023, respectively).

Discussion

The present study analyses the association between pain, as assessed by tenderness (tender points count and algometer score), and functional capacity and in female FM patients.

We observed a weak correlation between functional capacity and pain. Tender points count was weakly inverse associated with the chair stand and distance walked in the 6-minute walk tests. Likewise, algometer score showed a weak positive association with the back scratch and distance walked in the 6-minute walk tests, and a fair relationship with the chair stand test.

Table 2 Characteristics of the study participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>120</td>
<td>70.75 (13.66)</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>120</td>
<td>157.26 (4.97)</td>
</tr>
<tr>
<td>Body mass index (kg/m²)</td>
<td>120</td>
<td>28.54 (5.60)</td>
</tr>
<tr>
<td>Waist circumference (cm)</td>
<td>120</td>
<td>89.47 (13.78)</td>
</tr>
<tr>
<td>Body fat (%)</td>
<td>112</td>
<td>38.66 (7.70)</td>
</tr>
<tr>
<td>Skeletal muscle mass (kg)</td>
<td>112</td>
<td>23.45 (2.94)</td>
</tr>
<tr>
<td>Chair sit and reach (cm)</td>
<td>119</td>
<td>-10.09 (14.37)</td>
</tr>
<tr>
<td>Back scratch test (cm)</td>
<td>119</td>
<td>-9.52 (13.43)</td>
</tr>
<tr>
<td>Handgrip strength (kg)</td>
<td>119</td>
<td>17.13 (6.38)</td>
</tr>
<tr>
<td>Chair stand test (No. of stands)</td>
<td>110</td>
<td>7.20 (2.77)</td>
</tr>
<tr>
<td>8-ft up and go test (second)</td>
<td>119</td>
<td>8.35 (2.32)</td>
</tr>
<tr>
<td>30-second blind flamingo test (failures)</td>
<td>95</td>
<td>10.65 (5.35)</td>
</tr>
<tr>
<td>6-minute walk (m)</td>
<td>119</td>
<td>447.02 (83.54)</td>
</tr>
</tbody>
</table>

P values before adjustment for multiple comparisons.

Values are means (standard deviation), unless otherwise indicated.
Those patients with higher performance in aerobic capacity and lower body strength tests presented lower number of tender points and higher pain threshold. In addition, those patients with higher levels of upper body flexibility also presented higher pain threshold. To our knowledge, only one study [22] analyzed the association between lower body strength (isokinetic knee muscle strength) and tender points count and it did not find significant correlations. Other studies [10,23,24] analyzed the relationship between functional capacity and pain measured with the FIQ. They found no correlation between anaerobic threshold [10] and FIQ. The 6-minute walk, chair rising, and handgrip strength tests showed a moderate relationship with pain scale of FIQ [24].

Several studies found that overweight and obesity are common in persons with FM [43,44]. The prevalence of overweight women observed in our study (39%) is slightly higher than those reported in the United States [21–30%] [43–45] and in Israel’s (~28%) [46] FM patients. However, these studies reported a similar or higher prevalence of obesity compared with our study (33%), 32–50% in United States [43–45] and 45% in Israel [46]. Sotillo et al. [47] described the body composition of adult population in the southern Spain, and showed similar levels of BMI and body fat percentage than that observed in our study.

In general, we did not observe associations of body composition (weight, height, waist circumference, BMI and percentage body fat, and skeletal muscle mass) with tender points count or algometer score. Yunus et al. [43] and Neumann et al. [43,46] observed a weak relationship between BMI and tender points count ($r = 0.143, P = 0.037, N = 211$ and $r = 0.261, P = 0.011, N = 100$, respectively) in female FM patients. Okifuji et al. [44] observed that obese patients showed greater pain sensitivity in lower body tender points than overweight or normal weight patients. Moreover, they found that obese FM patients showed reduced flexibility (in the lower body areas) and strength, but there was no group difference in the walking test [44]. We have observed associations between BMI and back scratch, static balance, and 6-minute walk tests, as well as between weight and back scratch and 6-minute walk tests. Okifuji et al. [44] support that obesity is a prevalent comorbidity of FM that may contribute to the severity of the problem [44]. Indeed, Shapiro et al. [48] found that although weight was not significantly related to pain (assessed by means of West Haven-Yale Multidimensional Pain Inventory) at baseline, weight loss after a behavioral weight loss treatment significantly predicted a reduction in FM-related symptoms, pain interference, body satisfaction, and quality of life.

Okifuji et al. [44] also suggested that obesity influences the physical fitness ability to some extent in FM. In this sense, we have observed that the association between tender points count and functional capacity disappeared when the correlation was adjusted by weight or BMI. In contrast, the association between algometer score and functional capacity did not change in adjusted correlations, and even a new association with 8-ft up and go test was found.

### Table 3  Percentiles for functional capacity in women with fibromyalgia

<table>
<thead>
<tr>
<th>Tests</th>
<th>10th</th>
<th>25th</th>
<th>50th</th>
<th>75th</th>
<th>90th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair sit and reach (cm)</td>
<td>−28.00</td>
<td>−21.00</td>
<td>−9.50</td>
<td>−0.75</td>
<td>10.25</td>
</tr>
<tr>
<td>Back scratch test (cm)</td>
<td>−22.00</td>
<td>−17.00</td>
<td>−10.00</td>
<td>−1.00</td>
<td>7.50</td>
</tr>
<tr>
<td>Handgrip strength (kg)</td>
<td>8.80</td>
<td>12.50</td>
<td>16.70</td>
<td>21.85</td>
<td>25.45</td>
</tr>
<tr>
<td>Chair stand test (No. of stands)</td>
<td>4.00</td>
<td>5.00</td>
<td>7.00</td>
<td>9.00</td>
<td>11.00</td>
</tr>
<tr>
<td>8-ft up and go test (second)</td>
<td>11.09</td>
<td>9.10</td>
<td>7.88</td>
<td>6.76</td>
<td>5.94</td>
</tr>
<tr>
<td>30-second blind flamingo test (failures)</td>
<td>3.80</td>
<td>7.00</td>
<td>10.00</td>
<td>13.50</td>
<td>19.20</td>
</tr>
<tr>
<td>6-minute walk (m)</td>
<td>342.75</td>
<td>397.59</td>
<td>438.72</td>
<td>506.7</td>
<td>562.11</td>
</tr>
</tbody>
</table>

### Table 4  Tender point scores in women with fibromyalgia

<table>
<thead>
<tr>
<th>Tender Points</th>
<th>Women (N = 123)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occiput R</td>
<td>2.31 (0.85)</td>
</tr>
<tr>
<td>Occiput L</td>
<td>2.29 (0.84)</td>
</tr>
<tr>
<td>Anterior cervical R</td>
<td>1.78 (0.76)</td>
</tr>
<tr>
<td>Anterior cervical L</td>
<td>1.72 (0.72)</td>
</tr>
<tr>
<td>Trapezius R</td>
<td>2.46 (0.94)</td>
</tr>
<tr>
<td>Trapezius L</td>
<td>2.55 (0.99)</td>
</tr>
<tr>
<td>Supraspinatus R</td>
<td>2.70 (1.10)</td>
</tr>
<tr>
<td>Supraspinatus L</td>
<td>2.73 (1.07)</td>
</tr>
<tr>
<td>Second rib R</td>
<td>1.87 (0.68)</td>
</tr>
<tr>
<td>Second rib L</td>
<td>1.89 (0.72)</td>
</tr>
<tr>
<td>Lateral epicondyle R</td>
<td>2.26 (0.81)</td>
</tr>
<tr>
<td>Lateral epicondyle L</td>
<td>2.31 (0.89)</td>
</tr>
<tr>
<td>Gluteal R</td>
<td>2.59 (1.02)</td>
</tr>
<tr>
<td>Gluteal L</td>
<td>2.71 (1.06)</td>
</tr>
<tr>
<td>Great trochanter R</td>
<td>2.51 (0.94)</td>
</tr>
<tr>
<td>Great trochanter L</td>
<td>2.53 (0.94)</td>
</tr>
<tr>
<td>Knee R</td>
<td>2.15 (0.85)</td>
</tr>
<tr>
<td>Knee L</td>
<td>2.23 (0.90)</td>
</tr>
<tr>
<td>Algometer score</td>
<td>41.58 (13.49)</td>
</tr>
<tr>
<td>Number of tender points</td>
<td>17.06 (1.85)</td>
</tr>
</tbody>
</table>

R = right; L = left.

P values before adjustment for multiple comparisons. Values are mean (standard deviation).
is that 28 patients were not able to complete this test due to fatigue. Therefore, we do not recommend its use with FM patients.

Jones et al. [58] showed better performances in back scratch, chair sit and reach, and chair stand tests than those observed in our study, yet the sample was younger than our group of women (49.45 ± 8.05 vs 51.8 ± 7.2 years).

Recently, Jones et al. [16] compared the performance on the chair stand, 8-ft up and go, and 6-minute walk tests of people older than 50 years with and without FM (59.4 ± 7.5 and 68.0 ± 8.7, respectively), and FM patients showed lower performance in the three tests. The performance in these tests in our sample is lower than the FM patients of Jones et al.’s study in spite that our sample is younger.

When we compared the data of the current study with the functional capacity of community-residing older women aged 60–94 (N = 5,048) years [34], we observed that our median values (percentile 50) on chair sit and reach, back scratch, and chair stand test are below the 50th percentile in women aged 90–94 years. Likewise, the 8-ft up and go and 6-minute walk tests are approximately in the 50th percentile in women aged 85–89 years. These data are worrisome and suggest that FM patients have an aged functional capacity, which concur with the data showed in other studies [13,15].

Several limitations should be acknowledged. Our participants were volunteers and members from a local association and may have been in a better physical condition than average FM patients. We do not know whether individually tailored medication used for FM symptoms had limiting effects on physical performance in the patients. Finally, the lack of a group of healthy individuals limits further direct comparisons.
In summary, there are inverse associations of tender points count with the chair stand and distance walked in the 6-minute walk tests. These associations became non-significant once the analyses were adjusted by weight of BMI. There are positive associations of algometer score with the chair stand, distance walked in the 6-minute walk, and back scratch tests, which remain after adjusting for weight or BMI, except the association of algometer score and 6-minute walk test that became nonsignificant once the analyses were adjusted by weight. The results showed that FM patients have a reduced functional capacity. We also observed that obesity and overweight are common in FM patients. Regular physical activity could be a feasible option to increase functional capacity and reduce weight and pain, but medical and sports professionals should carefully consider their low functional capacity level when prescribing physical activity.

Acknowledgments

The authors would like to thank the researchers for the CTS-545 research group and Francisco B Ortega for his support and feedback during the preparation of the manuscript. We gratefully acknowledge all participating patients for their collaboration.

Financial support was provided by the Ministry of Education (Grant No. AP-2006-03676), Ministry of Science and Innovation (BES-2009-013442 RYC-2010-05957), Instituto Andaluz del Deporte (IAD), Center of Initiatives and Cooperation to the Development (CICODE, University of Granada), and MAPFRE Foundation.

References


