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FACTORS ASSOCIATED WITH TENDER POINT COUNT IN PUERTO RICANS WITH FIBROMYALGIA SYNDROME

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Abstract

Objective—To examine the factors associated with fibromyalgia syndrome (FMS) tender point count (TPC) in a group of Hispanic patients from Puerto Rico.

Methods—A cross-sectional study was performed in 144 FMS patients as determined using American College of Rheumatology [ACR] classification). Socio-demographic features, clinical manifestations, comorbidities, and pharmacologic agents were determined during the study visit. Tender points were assessed as described in the ACR classification for FMS. A *t*-test and one-way ANOVA test were used to examine the relationships between continuous, dichotomous, and nominal variables.

Results—The mean (standard deviation, [SD]) age of the FMS patients in this study was 50.2 (9.9) years; 95.1% were females. The mean (SD) TPC was 15.0 (4.7). Dysmenorrhea, the sicca syndrome, subjective swelling, increased urinary frequency, shortness of breath, headache, constipation, paresthesia, cognitive dysfunction, arthralgia, tiredness, morning stiffness, depression, and anxiety were associated with higher TPC. No associations were seen between socio-demographic features and FMS pharmacologic therapies.

Conclusion—In this group of Puerto Ricans with FMS, TPC was associated with several FMS symptoms and comorbidities. This study suggests that TPC may be a simple and effective tool for assessing disease severity in FMS patients.

Indexing terms

Fibromyalgia; tender point count; comorbidities; Hispanics

Introduction

Fibromyalgia syndrome (FMS) is a chronic pain disorder with a high prevalence worldwide (1–3). The diagnosis is based on whether is widespread pain in combination with specific tender points that are revealed upon digital palpation (11 of 18 sites, according to the 1990 American College of Rheumatology [ACR] criteria) (1). Besides chronic pain and tender points, FMS patients may present several other symptoms, such as chronic fatigue, sleep

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disturbance, morning stiffness, headache paresthesia, and anxiety, among other manifestations (1–3).

Comorbidities are more common in FMS than in other rheumatologic conditions (4). Likewise, comorbidities are more frequent in FMS patients than in control groups matched by age and gender (5). The most frequently associated comorbidities are depression, anxiety, gastrointestinal disorder, and genitourinary disorder (4–5).

Tender points (having a sensitivity of 90.1%) that manifest upon digital palpation are a good diagnostic tool for FMS (1). Although tender point count (TPC) is helpful for diagnosis, its usefulness in assessing FMS severity is uncertain. Some studies have demonstrated that TPC correlates with anxiety and depression (6–8). To the contrary, however, Wolfe *et al* established that the severity of FMS is independent of the number of tender points (9). It is this interesting discrepancy in the literature that led us to evaluate the associations of socio-demographic features, clinical manifestations, comorbidities, and pharmacologic agents with TPC in a population of Puerto Ricans with FMS.

Methods

A cross-sectional study was performed in 144 adult (≥21 years) Puerto Ricans with FMS. All the patients in the study met the 1990 ACR classification criteria for the diagnosis of FMS (1), and all were of Puerto Rican ethnicity (self and 4 grandparents). Consecutive patients were enrolled from December 2008 through December 2009 at the rheumatology clinics of the University of Puerto Rico Medical Sciences Campus in San Juan, Puerto Rico, and at 2 private rheumatology practices located in San Juan, Puerto Rico. This study was approved by the Institutional Review Board of the University of Puerto Rico Medical Sciences Campus.

During each patient's study visit, a complete history was taken and a physical exam was performed. A structured clinical form was completed for each patient in order to gather information about socio-demographic factors, cumulative comorbid conditions, and current (within the last month) FMS clinical manifestations and pharmacologic treatments. When necessary, the medical records of these FMS patients were reviewed to gather information about comorbid conditions.

Variables from the socio-demographic domain included age, gender, years of education, and lifestyle behaviors (smoking, using alcohol or illicit drugs, and exercising). Disease duration was defined as the time between the date of the initial FMS diagnosis and that of the study.

FMS clinical manifestations were assessed during a given patient's study visit and included tiredness, anorexia, weight loss, insomnia, cognitive dysfunction, headache, shortness of breath, constipation, diarrhea, urinating with high frequency, arthralgia, subjective swelling, morning stiffness, myalgia, paresthesia, sicca symptoms, and dysmenorrhea. Cumulative comorbidities were ascertained based on a given patient's history and by a review of his or her medical chart. Selected comorbid conditions included depression, anxiety, osteoarthritis, lumbar spine disease, cervical spine disease, osteoporosis, peripheral neuropathy, irritable bowel syndrome, irritable bladder syndrome, hyperlipidemia, hypertension, hypothyroidism,

diabetes mellitus, and bronchial asthma. Comorbid conditions were included if they were identified as being a diagnosis based on that patient's health history and on a chart review.

The medications being taken for FMS were ascertained during each patient's study visit and included the tricyclic antidepressants, serotonin selective reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitor (SNRIs), anticonvulsants, muscle relaxants, and non-steroidal anti-inflammatory drugs (NSAIDs).

Tender points were assessed as described in the ACR classification for FMS (1). The examined sites (9 pairs) were the following: the occiput (at the suboccipital muscle insertions), the low cervical area (at the anterior aspects of the intertransverse spaces at C5–C7), the trapezius muscle (at the midpoint of the upper border), the supraspinatus muscles (at their origins), the second rib (at the costochondral junctions), 2 cm distal to the lateral epicondyle), the upper outer quadrant of the buttocks, posterior to the greater trochanteric prominence, and the knees (at the medial fat pad proximal to the joint line). The total number of tender sites was then reported as being a given patient's TPC. The maximum score for TPC is 18.

Statistical analysis

The Statistical Package of Social Sciences (SPSS, Inc., Chicago) version 12.0 was used to perform univariate and bivariate analyses. Univariate analysis was employed to describe the frequency of the socio-demographic parameters, clinical manifestations, comorbid conditions and treatments. A *t*-test, and a one-way ANOVA test were used to examine the relationships between continuous, dichotomous, and nominal variables. The p-value used to determine statistical significance was ≤0.05.

Results

A total of 144 patients were evaluated during the study period. Table 1 shows the socio-demographic features, FMS clinical manifestations, comorbid conditions, and pharmacologic treatments. As was expected, the majority of the enrolled patients were females (95.1%). The mean age (standard deviation, SD) at study visit was 50.2 (9.9) years, and the mean (SD) disease duration was 4.9 (4.8) years. Most of the patients had high levels of education: 52.1% had more than 14 years of education. The mean (SD) body mass index (BMI) was 28.7 (5.4). The most common FMS clinical manifestations were tiredness (96.5%), arthralgia (95.8%), myalgia (92.3%), morning stiffness (86.1%), paresthesia (81.9%), cognitive disorder (77.8%), headache (73.6%) sicca symptoms (69.4%), and insomnia (67.4%).

The mean (SD) TPC was 15.0 (4.7). Table 2 depicts the associations of socio-demographic characteristics, clinical manifestations, and FMS pharmacologic therapy with TPC. Patients with dysmenorrhea, sicca symptoms, subjective swelling, increased urinary frequency, shortness of breath, headache, constipation, paresthesia, cognitive dysfunction, arthralgia, tiredness, morning stiffness, depression, or anxiety had significantly higher TPCs than did those patients not suffering from any of these symptoms or conditions. No associations were found between socio-demographic characteristics and FMS medications. Table 3 shows the

associations of comorbid conditions with TPC. Only patients with anxiety and depression had significantly high TPCs. No additional associations were found.

Discussion

In this study we evaluated the associations of socio-demographic features, clinical manifestations, comorbid conditions, and pharmacologic treatment with TPC in a group of Puerto Ricans with a diagnosis of FMS. Patients with FMS manifestations such as dysmenorrhea, sicca symptoms, subjective swelling, increased urinary frequency, shortness of breath, headaches, constipation, paresthesia, cognitive dysfunction, arthralgia, tiredness, morning stiffness, depression, and anxiety were more likely than those without such manifestations to have high TPCs. In addition, depression and anxiety disorder were associated with such TPCs. No associations were found for socio-demographic features and pharmacologic therapies.

To our knowledge, this is the first FMS study conducted in Puerto Ricans. The demographic and clinical profiles of our patients are similar when compared to those of other ethnic groups (3, 10–12). As in previous reports, we found that FMS is more common in women than in men and in patients with relatively high levels of education than it is in those with lower levels of education (2, 3, 9). In agreement with other studies, the most common clinical manifestations in our study group were also tiredness, arthralgia, myalgia, morning stiffness, and paresthesia (2, 11).

Comorbidities were frequent in our patients, the most common being osteoarthritis, depression, anxiety disorder, dyslipidemia, and hypertension. Previous studies have shown that the prevalence of comorbidities is higher (87.4%) in FMS patients than it is in non-FMS control groups (60.1%) (5). In Europe, a high percentage (43%) of patients have 3 or more comorbid conditions, particularly sleep disturbance, depression, and anxiety (3). Furthermore, Wolfe *et al* also showed that comorbid conditions are more common in FMS than they are in patients with other rheumatic conditions such as systemic lupus erythematosus and rheumatoid arthritis (4).

TPC is part of the clinical evaluation and diagnosis of FMS patients, but its clinical relevance remains controversial. Here, we found positive relationships between TPC and several clinical manifestations. Previous studies had reported similar associations; for example, Croft *et al* showed an association between TPC and chronic widespread pain and measures of depression, fatigue, and sleep problems (13), and Wolf *et al* demonstrated a linear relationship between FMS variables (fatigue, sleep, anxiety, depression, global severity, and pain) and TPC (14). Furthermore, Henriksen *et al* established an association between TPC and the functional status of FMS patients (6). More recently, a study by Aslli *et al* confirmed a positive correlation between TPC and depression, severe disease status, and pain intensity (7), and a study by Aparicio *et al* found an association between TPC and pain and depression using the Fibromyalgia Impact Questionnaire (15). In contrast, other studies did not find any significant associations between TPC and FMS clinical manifestations. Although Amris *et al* found a significant relationship between pain intensity and TPC, they did not find a significant correlation between TPC and either depression or

anxiety (16). Similarly, Castro-Sanchez *et al* did not identified a correlation between clinical pain characteristics and TPC (17). Wolfe *et al* also was unable to find a clinical association with TPC; they demonstrated that FMS patients with low TPCs had persistent somatic symptoms similar to those patients with higher counts (8).

The treatment of FMS is complex, requiring the use of multiple pharmacologic and nonpharmacologic therapies. In our study, no associations were found between TPC and several FMS medications. In agreement with our findings, those of Wright *et al* found that, in comparison with placebo use, duloxetine therapy did not result in a significant decrease of TPC (18).

Our study had some limitations. First, this was a cross-sectional study and as such had the limitations inherent to this type of design. This type of study design evaluates associations at a specific time of the disease without considering temporality. Second, we determined comorbidities by examining histories and doing chart reviews; this could lead to the underestimation of the real frequencies of these conditions. Third, we did not use standardized instruments to assess psychiatric conditions; these were recorded in the histories of the participating patients, only. Nonetheless, we took in consideration psychiatric conditions if they were diagnosed by a psychiatrist. Finally, the study included a group of Hispanics from Puerto Rico; thus, results are not intended to be generalized to other ethnic populations.

In conclusion, we found that TPC is associated with several FMS manifestations and psychiatric conditions in Puerto Ricans with FMS. This study suggests the TPC may be simple and effective tool for assessing disease severity in patients with FMS.

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Table 1

Socio-demographic features, clinical manifestations, and pharmacologic therapy in 144 patients with fibromyalgia syndrome.

Characteristic	
Female, %	95.1
Age, mean (SD) years	50.2 (9.9)
median	49.5
Age groups, n	
21–39	22
40–59	98
>60	24
Disease duration, mean (SD) years	4.9 (4.8)
Education (>14 years), %	52.1
Bone Mass Index, mean (SD)	28.7(5.4)
Mean (SD) tender point count	15.0 (4.7)
Current FMS symptom, %	
Tiredness	96.5
Anorexia	22.2
Weight loss	13.0
Insomnia	67.4
Cognitive dysfunction	77.8
Headache	73.6
Shortness of breath	57.6
Constipation	55.5
Diarrhea	27.8
Increased Urinary frequency	54.1
Arthralgia	95.8
Subjective swelling	41.0
Morning stiffness	86.1
Myalgia	92.3
Paresthesia	81.9
Sicca symptoms	69.4
Dysmenorrhea (n = 69)	49.0
Cumulative comorbid condition, %	
Depression	56.3
Anxiety	40.2
Osteoarthritis	59.0
Lumbar spine disease	39.5
Cervical spine disease	29.0
Osteoporosis	9.0

Characteristic	
Peripheral neuropathy	19.4
Irritable bowel syndrome	29.2
Irritable bladder syndrome	25.0
Hyperlipidemia	43.0
Hypertension	35.4
Hypothyroidism	14.5
Diabetes mellitus	9.7
Bronchial asthma	15.2
Current pharmacologic therapy	
Tricyclic antidepressants	15.2
SSRIs	23.6
SNRIs	41.7
Anticonvulsants	47.9
Muscle relaxants	28.5
NSAIDs	30.5

SD: Standard deviation; SSRIs: Serotonin selective reuptake inhibitors; SNRIs: Serotonin-norepinephrine reuptake inhibitors; NSAIDs: Non-steroidal anti-inflammatory drugs

Table 2

The association of socio-demographic characteristics, clinical features, and pharmacological therapy with FMS tender point count.

Feature	Mean (SD) tender point count		p-value
	Feature present	Feature absent	
Socio-demographic characteristic			
Female	14.9 (4.7)	16.9 (2.3)	0.292
Age			
20–39 years	14.9 (5.2)		
40–60 years	15.2 (4.4)		0.600
>60 years	14.2 (5.4)		
Education (>14 years)	15.0 (4.9)	15.0 (4.6)	0.989
Exercises	15.2 (4.6)	15.0 (4.7)	0.782
Smokes cigarettes	16.6 (3.1)	14.9 (4.7)	0.315
Current clinical feature			
Tiredness	15.2 (4.7)	10.4 (2.5)	0.024*
Anorexia	15.8 (4.0)	14.8 (4.8)	0.307
Weight loss	13.9 (5.3)	15.1 (4.6)	0.371
Insomnia	14.8 (5.0)	15.5 (4.0)	0.418
Cognitive dysfunction	15.4 (4.7)	13.4 (4.5)	0.050*
Headache	15.8 (4.0)	12.9 (5.7)	0.001*
Shortness of breath	15.9 (4.7)	13.5 (4.6)	0.003*
Constipation	15.8 (4.0)	13.9 (5.7)	0.001*
Diarrhea	15.9 (4.3)	14.7 (4.8)	0.157
Urinary frequency	16.0 (4.1)	13.8 (5.0)	0.005*
Arthralgia	15.2 (4.5)	10.2 (6.5)	0.009*
Subjective swelling	16.0 (4.6)	14.3 (4.6)	0.029*
Morning stiffness	15.4 (4.7)	13.0 (4.1)	0.035*
Myalgia	15.1 (4.8)	14.1 (3.0)	0.488
Paresthesia	15.7 (4.5)	12.2 (4.5)	0.001*
Sicca symptoms	16.0 (4.3)	12.7 (4.7)	0.000*
Dysmenorrhea	16.9 (2.7)	12.5 (5.4)	0.000*
Current pharmacological therapy			
Tricyclic antidepressants	15.3 (4.2)	14.8 (4.8)	0.546
SSRIs	15.1 (4.8)	13.8 (4.5)	0.084
SNRIs	15.5 (4.1)	14.7 (5.0	0.314
Anticonvulsants	15.2 (4.6)	14.9 (4.8)	0.680
Muscle relaxants	15.6 (4.6)	14.8 (5.0)	0.353

Feature	Mean (SD) tender point count		p-value
	Feature present	Feature absent	
NSAIDs	15.1 (4.6)	14.9 (4.8)	0.772

FMS: Fibromyalgia syndrome; SD: Standard deviation; SSRIs: Serotonin selective reuptake inhibitors; SNRIs: Serotonin-norepinephrine reuptake inhibitors; NSAIDs: Non-steroidal anti-inflammatory drugs

* p-value ≤ 0.05 by one-way ANOVA

Table 3

The association of selected comorbid conditions and FMS tender point count.

Condition	Mean (SD) tender point count		p-value
	Condition present	Condition absent	
Depression	15.8 (3.8)	14.0 (5.5)	0.025*
Anxiety	16.8 (4.0)	14.2 (5.2)	0.008*
Osteoarthritis	14.5 (5.1)	15.9 (3.8)	0.082
Lumbar spine disease	15.1 (4.5)	15.0 (4.8)	0.942
Cervical spine disease	14.5 (4.9)	15.3 (4.6)	0.339
Osteoporosis	16.2(2.5)	14.9 (4.8)	0.335
Peripheral neuropathy	15.6 (4.3)	14.9 (4.8)	0.529
Irritable bowel syndrome	15.0 (5.9)	15.1 (4.1)	0.684
Irritable bladder syndrome	15.3 (4.8)	14.9 (4.6)	0.690
Hyperlipidemia	15.6 (4.4)	14.6 (4.9)	0.253
Hypertension	15.2 (4.8)	14.9 (4.6)	0.760
Hypothyroidism	15.2 (5.8)	15.0 (4.5)	0.825
Diabetes mellitus	15.8 (4.0)	14.9 (4.7)	0.529
Bronchial asthma	15.8 (4.6)	14.9 (4.7)	0.423

SD: Standard deviation

* p-value ≤ 0.05 by one-way ANOVA