Evidence of disordered symptom appraisal in fibromyalgia: Increased rates of reported comorbidity and comorbidity severity

F. Wolfe[1], D.J. Hawley[2]

[1]Arthritis Research Center and University of Kansas School of Medicine, Wichita; [2]School of Nursing, Wichita State University, Wichita, Kansas, USA.

Abstract

Objective

Using a large series of unselected consecutive patients, to investigate whether patients with fibromyalgia differ from those with rheumatoid arthritis (RA) or osteoarthritis (OA) in the number of reported comorbid conditions and in their perceived importance, and thereby to investigate differences in symptom appraisal and somatization.

Method

In a clinical care setting, 1,298 patients with fibromyalgia and 2,396 with RA or OA participating in longitudinal data bank research as part of their routine medical care completed questionnaires concerning the presence or absence of 23 comorbid conditions, and then rated the current importance of each condition to them. Additional information concerning psychological factors and disease severity was also obtained.

Results

In analyses adjusted for age and sex, patients with fibromyalgia reported more conditions (4.5 vs. 3.1) than those with RA or OA. In 17 of 23 conditions, the condition was more commonly reported in fibromyalgia than in RA or OA. In 20 of the 23 conditions, the importance attached to the conditions by fibromyalgia patients exceeded that of the importance attributed by RA/OA patients. After adjustment for anxiety, statistical differences between the groups for importance was lost for 6 conditions.

Conclusions

Fibromyalgia patients report more medical conditions and report that they are more important to them than do patients with RA or OA. These differences extend to conditions that might be expected to cause symptoms, as well as to those that are usually symptom free. These data suggest that, on average, patients with fibromyalgia appraise medical symptoms and their importance differently from patients with other rheumatic conditions.

Key words

Fibromyalgia, symptom appraisal, comorbidity, somatization.

Frederick Wolfe, MD, Professor of Medicine; Donna J. Hawley, MN, Ed.D.

Please address correspondence to: Frederick Wolfe, M.D., Arthritis Research Center, 1035 North Emporia, Suite 230, Wichita, KS 67214, USA.

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Introduction

Fibromyalgia is a multifactorial disorder that may have etiologic and pathogenic underpinnings in combinations of problems that relate to pain processing (1-3), external trauma (4-6), musculoskeletal abnormality (7-9), psychosocial disturbance (10-14), or attitudes of societal acceptance (15-17). A number of sources have suggested that fibromyalgia has features of a somatization disorder (11, 15, 18-21), or that persons with the syndrome have problems in the appraising of symptoms. In somatization disorders psychological problems are expressed as bodily symptoms. The diagnostic term, somatization disorder, as defined by the Diagnostic and Statistical Manual (DSM-IV) of the American Psychiatric Association (22) has been criticized as being too rigid because it requires lifelong symptoms for which there are no other medical explanations. At the same time, it is recognized that somatization can reflect increased utilization of services and reporting of symptoms without satisfying the DSM-IV criteria. DSM-IV allows the use of the term undifferentiated somatoform disorder under these circumstances. But even without such formal terminology the association between fibromyalgia and somatic complaints is well established, because multisystem somatic complaints are an essential part of the syndrome definition. But this presents a paradox, for multiple somatic symptoms may be seen as a psychiatric disorder while at the same time they could be the result of non-psychiatric causes (2, 23).

In addition to an increased number of symptom complaints, persons with distorted appraisals may see everyday symptoms as serious, requiring medical care (11, 24-27). Others who do not have appraisal problems might seem to see the same symptoms as expected, non-serious, and not requiring medical evaluation or treatment. Appraisal problems and somatization are, of course, linked, since patients who mis-appraise symptoms will report more medical conditions and diagnoses. Appraisal problems (symptom appraisal problems) can be defined as the combined tendency to over-interpret the seriousness of symptoms and to translate symptoms into disease.

If it can be demonstrated that appraisal problems exist in fibromyalgia, then one factor associated with the syndrome's pathogenesis and expression will have been clarified. In the current study, we attempted to evaluate somatization and appraisal by comparing patients with fibromyalgia to those with rheumatoid arthritis (RA) and osteoarthritis (OA) as to the number of self-reported symptoms and comorbid conditions and as to the severity of these symptoms and conditions. We hypothesized that increased somatization would exist in fibromyalgia if symptoms and comorbid conditions were consistently more frequently reported in the fibromyalgia group. In addition, if fibromyalgia patients reported consistently that these conditions are more serious than do the RA/OA patients, then that would be evidence for disordered symptom appraisal among patients with fibromyalgia.

Methods

Patient population

Beginning in 1974, consecutive patients seen at the Wichita Arthritis Center, an outpatient rheumatology facility, were enrolled into a computerized data bank at the time of their first clinic visit. The details of this data bank and cohort have been reported previously (28, 29). Demographic, clinical, laboratory, radiographic and self-report data were obtained at each follow-up assessment, and entered contemporaneously into the computer data bank. In addition, patients with RA, OA of the knee or hip, and fibromyalgia also completed mailed questionnaires at 6-month intervals if they chose to participate in ongoing questionnaire research, and these data were included in the study.

All RA patients in the study satisfied the 1958 or 1987 criteria for RA at some point in their disease course (30, 31). Fibromyalgia patients satisfied criteria in effect at the time of enrollment (32, 33). Osteoarthritis patients were diagnosed clinically as having osteoarthritis of the knee and hip, and the group was studied as a whole. Patients with OA satisfied the current American College of Rheumatology criteria for the diagnosis (34-36). Overlaps in diagnosis were resolved as follows: RA patients were clas-

sified as having RA regardless of any other rheumatic disease diagnosis; OA patients were classified as OA provided only that they did not have an inflammatory rheumatic disorder; and fibromyalgia patients did not have diagnosed RA or knee or hip joint OA.

Demographic, clinical and laboratory data

At each clinic and questionnaire visit the following demographic variables were recorded: sex, age, ethnic origin, education level, number of children, smoking history, total income, current marital status, and comorbid conditions and associated symptoms. The clinical variables included the tender joint count, grip strength, Stanford Health Assessment Questionnaire disability score (HAQ disability) (37, 38), visual analog scale (VAS) pain scale, VAS global severity, Arthritis Impact Measurement Scales (AIMS) (39, 40) for anxiety and for depression, comorbid conditions, body mass index (BMI), erythrocyte sedimentation rate (ESR) (41, 42) and rheumatoid factor (43). The HAQ was added to the data bank on July 1, 1980. The AIMS anxiety and depression scores were added in November, 1981.

For the purposes of analysis, the clinical and questionnaire values used were the means of each patient's values. For example, if a patient had 10 anxiety determinations while he or she was being followed, the value used in the analyses was the mean value of the 10 determinations. The Rheumatology distress index (RDI) was computed from the questionnaire variables described above, using the following formula: Rheumatology Distress Index = [(anxiety/9.9) + (depression/9.9) + (global severity/100) + (sleep disturbance/3) + (fatigue/3)] x 20. The divisors for each scale convert the variable to a 0 - 1 range. This index is the best variable to separate fibromyalgia from non-fibromyalgia patients (44).

We also provided patients with an itemized list of comorbid or associated conditions at every assessment, and inquired whether the symptom/condition was present currently or had been present in the past. If a symptom/comorbid condition was present now or had been in the past, we considered the patient to be positive for this condition. In analyzing these data, we chose for analysis the last assessment (visit) at which the condition was labeled as being present now or in the past. If the condition(s) was never present then we analyzed data from the last assessment. For each comorbid or associated condition that was identified, patients were asked to rate the importance of the symptom on the following scale: 0 = not important, 1 = mildly important, 2 = moderately important, 3 = very important.

Statistical analysis

Data were analyzed using Stata version 5.0 (45). Rates of comorbid and associated conditions were calculated by logistic regression, adjusted for age and sex. Symptom importance was analyzed by linear regression, and by covariance analysis after adjustment for anxiety. In the symptom importance analyses, only patients who reported the comorbid or associated condition were analyzed. The comparisons between groups in Table I were performed by t-tests for continuous variables and chi-square analysis for categorical variables. Statistical significance was set at the 5% level. All p-values were two-tailed.

Results

Demographic and clinical variables

Table I displays the demographic characteristics of the patient groups. Of the 3,694 patients in this study, 1,298 had fibromyalgia (35.1%) and 2,396 (64.9%) had RA or OA. As expected, fibromyalgia patients were younger (51.2 years vs. 64.8 years), mostly female (86.8% vs. 59.6%), and had significantly more abnormal scores for all of the clinical variables except HAQ disability. Except for HAQ, these differences were clinically significant, as well.

Comorbid and associated conditions

Table II displays the unadjusted lifetime prevalence of the self reported comorbid conditions for the three groups. As expected, patients with RA had higher rates for cataract, pulmonary disease, fractures and GI disorders. These higher rates were to be expected because of the corticosteroid treatment and extra-articular manifestations of RA. Similarly, increased rates of hypertension were expected and found in OA. Except for these differences, RA and OA patients were similar in comorbidity reports. Therefore, we combined both groups into a single "control group" for further analyses. Because of the age and sex differences between the groups, all subsequent analyses were performed while controlling for age and sex.

As shown in Figure 1, for 21 of the 23 variables examined, fibromyalgia patients reported more comorbid or associated conditions ($p < 0.001$). This was particularly striking for GU, GI, depression, allergy, infection, CV, gall bladder, thyroid, renal, asthma, diverticulitis, and osteoporosis. RA and OA patients reported more hypertension and cataract problems, but these differences were not statistically significant. Non-significant

Table I. Demographic and clinical characteristics of the fibromyalgia and RA/OA patients.

	Fibromyalgia (n = 1,298)		RA and OA (n = 2,396)	
Variable	Mean or %	S.D.	Mean or %	S.D.
Age (years)	51.2	13.6	64.8	14.5
Sex (% female)	86.6%		59.6%	
Education (years)	12.7	2.3	12.4	2.6
Global severity (0 - 100)	56.0	21.8	44.6	20.2
VAS Pain (0 - 3)	1.9	0.7	1.5	0.7
HAQ disability (0 - 3)	1.1	0.6	1.0	0.7
Anxiety (0 - 9.9)	5.3	1.9	3.7	1.8
Depression (0 - 9.9)	3.6	1.8	2.5	1.6
VAS Fatigue (0 - 3)	2.1	0.7	1.4	0.8
Sleep disturbance (0 - 3)	1.8	0.8	1.1	0.8
Rheumatology distress index (0 - 100)	58.2	16.7	38.6	18.6

Table II. Lifetime prevalence of self-reported comorbid conditions in fibromyalgia, RA and OA.

Condition	Proportion	UCI	LCI	Condition	Proportion	UCI	LCI
Allergies				Hypertension			
RA	20.1%	18.0%	22.3%	RA	38.6%	35.9%	41.3%
OA	19.1%	16.7%	21.7%	OA	50.9%	47.6%	54.3%
Fibromyalgia	35.3%	32.5%	38.2%	Fibromyalgia	40.0%	37.1%	43.0%
Asthma				Infection			
RA	11.6%	10.0%	13.4%	RA	21.0%	18.4%	24.0%
OA	8.6%	7.0%	10.6%	OA	20.6%	16.4%	25.6%
Fibromyalgia	17.7%	15.5%	20.1%	Fibromyalgia	33.5%	28.3%	39.2%
Cancer				Liver			
RA	12.9%	11.2%	14.9%	RA	5.1%	4.0%	6.4%
OA	9.6%	8.0%	11.5%	OA	3.2%	2.2%	4.4%
Fibromyalgia	11.7%	9.8%	13.8%	Fibromyalgia	5.1%	4.0%	6.6%
CVA				MI			
RA	3.9%	3.0%	5.1%	RA	5.9%	4.7%	7.3%
OA	3.5%	2.6%	4.8%	OA	4.1%	3.1%	5.4%
Fibromyalgia	3.8%	2.8%	5.2%	Fibromyalgia	4.5%	3.4%	6.0%
Cataract				Neuro			
RA	17.3%	15.1%	19.8%	RA	4.7%	3.7%	6.0%
OA	10.0%	8.3%	11.9%	OA	4.0%	2.9%	5.4%
Fibromyalgia	12.5%	10.4%	14.9%	Fibromyalgia	6.4%	5.0%	8.0%
Depression				Osteoporosis			
RA	29.1%	26.7%	31.6%	RA	4.1%	3.0%	5.8%
OA	20.8%	18.3%	23.5%	OA	3.2%	1.9%	5.4%
Fibromyalgia	48.0%	45.0%	51.0%	Fibromyalgia	8.4%	5.7%	12.4%
Diabetes				Psychiatric			
RA	9.3%	7.8%	11.0%	RA	4.6%	3.6%	5.9%
OA	12.3%	10.4%	14.5%	OA	4.7%	3.5%	6.2%
Fibromyalgia	12.2%	10.4%	14.3%	Fibromyalgia	6.7%	5.4%	8.4%
Diverticulitis				Pulmonary			
RA	4.3%	3.1%	5.9%	RA	19.3%	17.2%	21.5%
OA	8.8%	6.2%	12.5%	OA	9.0%	7.5%	10.9%
Fibromyalgia	14.1%	10.5%	18.7%	Fibromyalgia	16.7%	14.5%	19.1%
Alcohol				Renal			
RA	2.9%	2.1%	3.9%	RA	15.0%	13.1%	17.0%
OA	2.7%	1.9%	3.9%	OA	13.7%	11.7%	15.9%
Fibromyalgia	4.1%	3.1%	5.4%	Fibromyalgia	22.8%	20.3%	25.5%
Fractures				Thyroid			
RA	20.0%	17.9%	22.2%	RA	19.7%	17.6%	22.0%
OA	16.6%	14.4%	19.0%	OA	19.7%	17.3%	22.4%
Fibromyalgia	19.9%	17.6%	22.5%	Fibromyalgia	24.6%	22.1%	27.3%
Gall Bladder				GI			
RA	19.2%	17.1%	21.4%	RA	41.3%	38.6%	44.0%
OA	22.3%	19.7%	25.1%	OA	29.8%	27.0%	32.8%
Fibromyalgia	29.8%	27.1%	32.7%	Fibromyalgia	51.7%	48.7%	54.7%
GU							
RA	37.8%	35.2%	40.5%				
OA	45.3%	42.1%	48.6%				
Fibromyalgia	65.3%	62.4%	68.1%				

differences were also noted for fractures, diabetes, cancer, liver problems, and CVA.

Overall, after adjusting for age and sex, patients with fibromyalgia reported 4.5 (SE 0.08) conditions compared to 3.1 (SE 0.06) for those with RA/OA. Table III shows an increasing association of the number of reported comorbid conditions with the diagnostic category. At the 90th percentile (mean number of comorbid conditions = 10.4), patients were 6.1 times more likely to have fibromyalgia than RA/OA.

Importance of comorbid and associated conditions

As shown in Figure 2, for 20 of the 23 conditions or symptoms, fibromyalgia patients reported greater symptom importance ($p < 0.001$). Statistically significant differences were noted for 12 conditions: depression, psychiatric disorders, hypertension, allergy, asthma, GI, pulmonary, thyroid, fractures, cancer, GU and gall bladder disorders. To understand whether these results were associated with anxiety, we regressed the symptom importance scores on diagnosis and anxiety. In six of these analyses, statistical significance was lost after adding anxiety as a covariate: hypertension, pulmonary disorders, thyroid disorders, fractures, cancer, and GU disorders.

Discussion

The results of this study show that fibromyalgia patients report more comorbid and associated conditions and attribute more importance to them than do patients with RA and OA, even after controlling for age and sex. These data extend to the larger RA/OA group the partial observations as to comorbid and associated symptom prevalence that we have made previously regarding fibromyalgia versus RA patients (46). They are also in accord with our observations of increased lifetime surgery in patients with fibromyalgia (46).

We also noted that patients with fibromyalgia almost universally appraise the current importance of these lifetime comorbid conditions as more important than do patients with OA/RA. While it may be argued that fibromyalgia patients experience more distress from symptoms

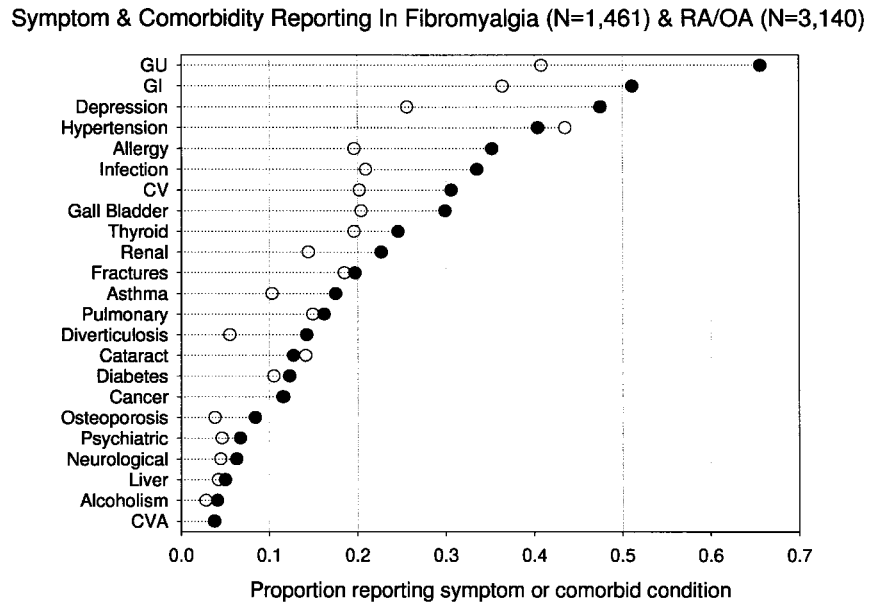

Fig. 1. Proportion of patients ever reporting specific comorbid or associated conditions, controlling for age and sex. Fibromyalgia (●) and RA and OA patients (❍).

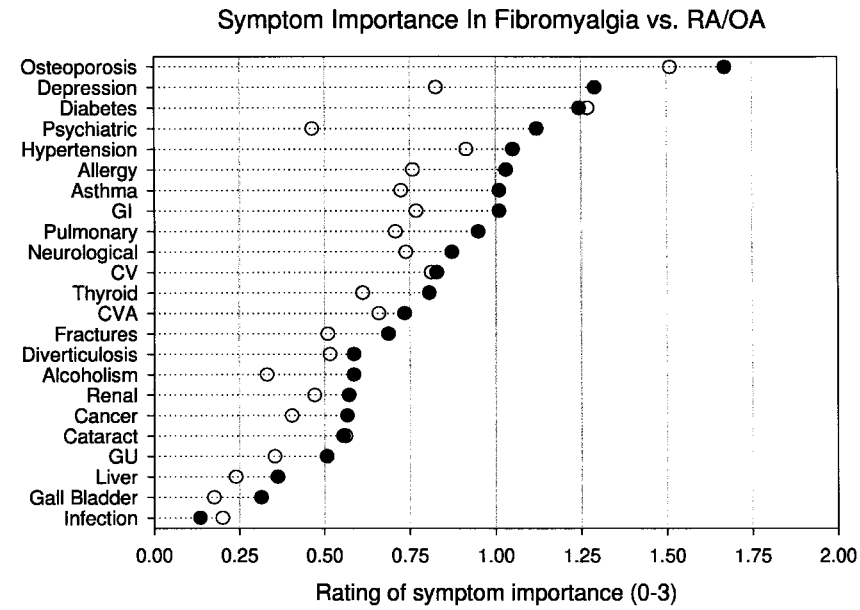

Fig. 2. Comparison of the importance of the comorbid or associated condition at the last assessment. Fibromyalgia (●) and RA and OA patients (❍).

Table III. Association of the number of reported comorbid conditions with fibromyalgia.

Decile	N	Mean number of comorbid conditions	Odds ratio*	S.E.	Z	p-value
1st	1063	0				
3rd	424	1	1.663	0.257	3.295	0.001
4th	533	2	2.769	0.393	7.181	0.000
5th	554	3	3.771	0.525	9.537	0.000
6th	452	4	4.243	0.622	9.865	0.000
7th	398	5	3.575	0.547	8.329	0.000
8th	355	6	5.135	0.801	10.493	0.000
9th	465	7.4	4.905	0.719	10.854	0.000
10th	357	10.4	6.058	0.956	11.415	0.000

* Odds of having fibromyalgia compared to RA/OA for each decile compared to 1st decile.

than do others, even if this were true it would not explain the increased importance attributed to generally symptom-free conditions such as hypertension, thyroid disease, and past fractures. When we investigated the role of anxiety in symptom severity, however, we found that the statistical significance between the groups for hypertension, thyroid disease, and past fractures disappeared after controlling for anxiety levels. This observation suggests that anxiety or other psychological factors may play a role in symptom reporting and severity. We have previously noted that fibromyalgia patients reported more hypertension than those with RA, but that the actual blood pressure measured in the clinic was lower in the fibromyalgia patients, as might be expected given their younger age (46).

In the clinic we have sometimes noted that patients with fibromyalgia seem to interpret symptoms differently from rheumatologists. For example, we have noted clinically that some report symptoms as diseases. Stomach pain becomes ulcers, a cardiovascular evaluation may be equated with heart disease, and negative reports may be interpreted as being positive. It is likely that the data we have reported here reflects this difference in interpretation rather than actual differences in the prevalence rates of comorbid conditions, for in unpublished data we have noted that mortality rates are not different in fibromyalgia patients compared to the general population, something that might be expected if reported comorbidity equated with actual disease.

What do these data mean and what do they not mean? They do not mean that all patients with fibromyalgia have a somatoform disorder or that fibromyalgia is simply such a disorder. But they do mean that self-reported medical conditions are, on average, more prevalent in fibromyalgia. In addition, for a subset of fibromyalgia patients, most comorbid and associated medical disorders have an increased and perhaps unwarranted seriousness. DSM-IV describes the essential feature of a somatization disorder as "... a pattern of recurring, multiple, clinically significant somatic complaints (22)". DSM-IV reports that

patients with somatization disorders describe their complaints in “colorful, exaggerated terms” (22). “Prominent anxiety symptoms and depressed mood are very common ...” (22). We did not examine patients to determine whether they had, in fact, a somatization or somatoform disorder, so we are unable state whether the results of this study might be explained by the DSM classification. Do the findings of this study of increased symptom importance represent part of a general over-reporting, an over-reporting that extends to pain and other symptoms? Our data do not address this point, but they not at all inconsistent with a general over-reporting or with what has been proposed as a hyper-vigilance hypothesis (47-49). We have noted previously that the rate of childhood tonsillectomy is increased in fibromyalgia (46). This observation suggests that at least some of the symptom reporting behavior reported in the current study may derive from behaviors learned in childhood.

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