Further clues to recognition of patients with fibromyalgia from a simple 2-page patient multidimensional health assessment questionnaire (MDHAQ)

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Abstract

Objective

To analyze quantitative scores for pain, fatigue, functional disability, and the number of symptoms on a review of systems on a multidimensional health assessment questionnaire (MDHAQ), including the ratios of scores for pain to physical function and fatigue to physical function, and to further study how these scores can help to identify patients with fibromyalgia.

Methods

All consecutive patients seen at a rheumatology clinic completed a 2-sided, 1-page MDHAQ at each visit to assess physical function, pain, fatigue, global status, helplessness and review of systems, and had their erythrocyte sedimentation rate (ESR) measured. Scores for these variables were analyzed in 78 consecutive patients with fibromyalgia over a two-year period, and in 149 patients with rheumatoid arthritis (RA) as a "control" group. A subset analysis was conducted in patients with RA who were classified independently according to clinical criteria as having or not having coexistent fibromyalgia. Descriptive statistics, logistic regression, and receiver-operating-characteristic curves were computed for patients with fibromyalgia and compared to patients with RA.

Results

Patients with fibromyalgia had high ratios of pain:physical function and fatigue:physical function scores, and a high number of reported symptoms. These quantitative data differed significantly from patients with RA. Patients with fibromyalgia also had a lower ESR than patients with RA, whose scores were similar whether or not there was coexistent fibromyalgia. Patients with fibromyalgia were distinguished equally well from patients with RA by patient questionnaire data as by the ESR.

Conclusion

A simple 1-page, 2-sided patient questionnaire provides quantitative information which may contribute to identify patients with fibromyalgia, including patients with RA who may also have coexistent fibromyalgia.

Key words

Symptoms, rheumatoid arthritis (RA), fibromyalgia, patient questionnaires, erythrocyte sedimentation rate (ESR).

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Supported in part by the Arthritis Foundation, Jack C. Massey Foundation, the Maury County Lupus Fund, and the Showa Denko Corporation.

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Received on December 24, 2003; accepted in revised form on April 9, 2004.

Introduction

The diagnosis of fibromyalgia is often pursued as a "diagnosis of exclusion" in which doctors order extensive laboratory tests, radiographs, and other studies to attempt to explain a patient's substantial pain, fatigue and other symptoms of distress. However, experienced rheumatologists often are able to make a diagnosis of fibromyalgia based on brief interactions with a patient from the patient's description of symptoms and physical examination, with frequently a positive "review of systems" and high levels of fatigue and pain relative to few physical findings other than tender points (1). Nonetheless, inexperienced clinicians often do not recognize these patterns and may then pursue elaborate diagnostic evaluations with extensive laboratory tests and imaging procedures.

We have described a pattern of responses to a simple 2-sided, 1-page patient questionnaire of very high pain scores with moderate to low scores for physical function in activities of daily living in people with fibromyalgia. A ratio of 5 or more for the score on a pain visual analog scale relative to the score on a modified health assessment questionnaire (MHAQ) to assess physical function in activities of daily living was seen only in patients with fibromyalgia and in no patients with rheumatoid arthritis (RA) only, who served as a control group (2). These findings in no way suggest that a definitive diagnosis of RA or fibromyalgia can be established from a questionnaire, but do provide a "clue" to the diagnosis of fibromyalgia, as noted in the title of that report (2). Information which could contribute to a more rapid recognition of fibromyalgia would allow the physician to spend more time on the education and counseling of affected patients.

One situation in which a clue to the possible identification of fibromyalgia may be particularly useful involves patients who might meet criteria for RA or other rheumatic diseases, but who have severe concomitant fibromyalgia as an important clinical problem. It has been estimated that about 1 in 6 patients with RA has significant clinical fibromyalgia (3), and fibromyalgia appears to be more common in patients with inflammatory rheumatic diseases than in the general population (4). For example, some patients may fail therapy with anti-TNF because their primary clinical problem is fibromyalgia, although they may meet American Rheumatism Association (ARA) criteria for RA, including criteria for active disease used for enrollment in clinical trials (5).

We have continued to ask all patients seen in our clinic to complete a 1-page, 2-sided questionnaire to help document the severity of their clinical status and responses to therapy (6-8). The ratio of pain:MHAQ scores (2) continues to be useful as a clue to fibromyalgia. We have also observed two further patterns on a multi-dimensional health assessment questionnaire (MDHAQ) which may serve as clues to identify individuals with fibromyalgia: a) a ratio of scores for fatigue to physical function; b) the number of symptoms on a symptom check list. These observations are presented in this report, while emphasizing once again that a questionnaire cannot provide a definitive diagnostic test, but a clue to the likelihood of fibromyalgia. This clue might nonetheless be useful to rheumatologists and worthy of dissemination to non-rheumatologists, as a possible cost-saving measure in approaching patients who may have fibromyalgia.

Patients and methods

Patient questionnaire

A 2-sided, 1-page multi-dimensional health assessment questionnaire (MDHAQ) (6) is derived from the Stanford Health Assessment Questionnaire (HAQ) (9) and its modified version (MHAQ) (10, 11). The MDHAQ includes 10 activities of daily living (ADL), 8 derived from the HAQ and 2 additional complex ADL – walk 2 miles and participate in sports and games (Fig.1). The MDHAQ also includes visual analog scales (VAS) to assess pain, fatigue, and global status, and a listing of 57 symptoms which provides a review of systems (Fig. 2). Data concerning some patients were compiled prior to the introduction of these new items in 1995,

Please check (✓) if you have experienced any of the following over the last month:

__Fever	__Lump in your throat	__Paralysis of arms or legs
__Weight gain (>10 lbs)	__Cough	__Numbness or tingling of arms or legs
__Weight loss (<10 lbs)	__Shortness of breath	__Fainting spells
__Feeling sickly	__Wheezing	__Swelling of hands
__Headaches	__Pain in the chest	__Swelling of ankles
__Unusual fatigue	__Heart pounding (palpitations)	__Swelling in other joints
__Swollen glands	__Trouble swallowing	__Joint pain
__Loss of appetite	__Heartburn or stomach gas	__Back pain
__Skin rash or hives	__Stomach pain or cramps	__Neck pain
__Unusual bruising or bleeding	__Nausea	__Use of drugs not sold in stores
__Other skin problems	__Vomiting	__Smoking cigarettes
__Loss of hair	__Constipation	__More than 2 alcoholic drinks per day
__Dry eyes	__Diarrhea	__Depression - feeling blue
__Other eye problems	__Dark or bloody stools	__Anxiety - feeling nervous
__Problems with hearing	__Problems with urination	__Problems with thinking
__Ringing in the ears	__Gynecological (female) problems	__Problems with memory
__Stuffy nose	__Dizziness	__Problems with sleeping
__Sores in the mouth	__Losing your balance	__Sexual problems
__Dry mouth	__Muscle pain, aches, or cramps	__Burning in sex organs
__Problems with smell or taste	__Muscle weakness	__Problems with social activities

Please check (√) here if you have had none of these symptoms: _____.

Fig. 1. Symptom checklist included on a multidimensional health assessment questionnaire (MDHAQ), which serves as a review of systems. The checklist includes 60 items, 57 of which are regarded as symptoms and 3 (use of drugs not sold in stores, smoking cigarettes, and more than 2 alcoholic drinks per day) are regarded as "habits." Scoring of the number of symptoms is based on a simple count of 57 symptoms.

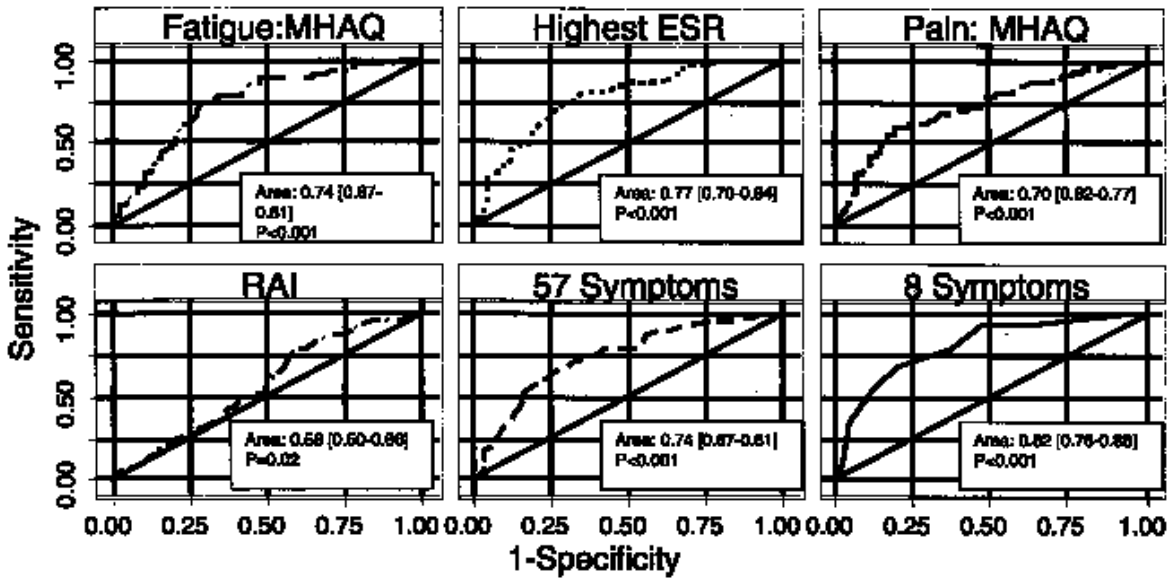

Fig. 2. Receiver-operating-characteristic curves comparing consecutive patients with rheumatoid arthritis (RA) or fibromyalgia in a rheumatology clinic.

Fatigue: MHAQ	= Ratio of score for fatigue on a visual analog scale to the score for 8 activities of daily living on the modified health assessment questionnaire (MHAQ)
Highest ESR	=Highest value of the erythrocyte sedimentation rate recorded for that patient
Pain: MHAQ	= Ratio of the score for pain on the visual analog scale to the score for 8 activities of daily living on the modified health assessment questionnaire (MHAQ)
RAI	=Rheumatology attitudes index to measure helplessness
57 Symptoms	=Number of symptoms among 57 symptoms reported as being present by the patient
8 Symptoms	= Number of symptoms among 8 of 57 symptoms, identified by rheumatologists as likely to differ in patients with fibromyalgia compared to those with RA

and analyses are presented here only according to the 8 MHAQ ADL (10), all of which are included in the MDHAQ (6). These analyses also allow the data to be compared to our previous study of the ratios of MHAQ ADLto a pain VAS (2).

In order that this study would be comparable to our previous study (2), the MHAQ in this study was scored as 1-4 (1=without any difficulty, 2=with some difficulty, 3 = with much difficulty, 4 = unable to do), rather than using the current convention which is to score these same responses at 0-3, respectively, similar to the HAQ (9). Both scoring methods yield the same results on a 4-point scale, with adjustments for the measurement used.

Patients

A version of the MDHAQ was completed by all of 594 consecutive patients seen between September 1994 and December 1996 in 1,957 consecutive visits at a weekly academic adult rheumatology clinic conducted by TP. Patients seen after 1996 are not included because by that time an awareness of the preliminary analyses of the data reported here might have influenced the diagnosis assigned by the rheumatologist. Over this period, 78 patients were diagnosed with fibromyalgia and 149 were diagnosed with RA. All of the patients diagnosed with RA met the 1987 American Rheumatism Association (ARA) criteria (12, 13).

During the first 16 months of the study, formal review of the patients diagnosed clinically with fibromyalgia did not include ARAcriteria (1); in later months, the follow-up of 24 patients labeled as having fibromyalgia revealed that 22 met the formal criteria for fibromyalgia. The term "fibromyalgia" is used in this report to indicate a clinical judgment by the rheumatologist (TP) that patients had clinical evidence of generalized musculoskeletal pain without an anatomic or physiologic explanation of RA, osteoarthritis, or other localized rheumatic diagnosis, recognizing that about 10% of these patients may not meet formal ARA criteria involving tender points. It has been suggested that the fibromyalgia syndrome represents more of a continuum than is inferred by the formal criteria (14, 15).

Other patients seen over this period included 367 patients who had diagnoses other than fibromyalgia or RA. Analyses were performed on patients with fibromyalgia, and patients with RA as a "control" group. Analyses of the other 367 patients are not included in studies reported here.

The rheumatologist (TP) also identified each patient as having an empirical level of fibromyalgia, without knowledge of the questionnaire scores, using four categories: 0 = none, 1 = mild, 2 = moderate, 3=severe fibromyalgia, based on simple global impressions. This empirical scale has been used in a prospective manner in all patients seen since 1997, including each of 622 consecutive patients with 7,088 ratings, with kappa scores of 0.65, suggesting good reliability (T. Pincus, unpublished data). In analyses presented in this report, patients with RA were classified into two categories: 125 of 149 RApatients (84%) were rated 0 or 1 and designated as not having fibromyalgia, and 24 RA patients (16%) were rated 2 or 3 and designated as having fibromyalgia.

A subset analysis was performed to compare 24 of the 149 patients with RAdesignated by the rheumatologist to have fibromyalgia compared to 125 judged not to have fibromyalgia.

Physician questionnaire regarding specific symptoms to differentiate patients with non-inflammatory musculoskeletal pain from patients with RA

In order to study the face validity of the symptoms which might be reported differently in patients with fibromyalgia from patients with RA, 11 experienced rheumatologists were given a copy of the MDHAQ review of systems list (see Fig. 2), and asked to identify which of the 57 specific symptoms listed would be expected to be reported significantly more commonly by patients with fibromyalgia compared to those with RA or vice versa. The 11 rheumatologists listed 6-22 symptoms as likely to be reported differently in patients with fibromyalgia compared to RA. At least 50% of these rheumatologists identified seven symptoms as being more likely to be reported by patients with fibromyalgia compared to RA: "unusual fatigue", "headaches", "numbness or tingling of arms and legs", "muscle pain, aches or cramps", "problems with memory", "problems with thinking", and "problems with sleeping", and one as more likely in patients with RA compared to fibromyalgia, "swelling in joints other than the hands and ankles" (Table I).

The 57 symptoms were designated as the "57 symptom scale." The 8 symptoms nominated by the majority of rheumatologists were designated as the "8 symptom subscale," with reverse scoring for "swelling in joints other than hands and ankles."

Data management and analysis

Patient questionnaire responses, as well as laboratory data and medications, were recorded in MEDLOG, a time-oriented database software management system (MEDLOG, Inc., Incline Village, Nevada), designed to analyze data collected at irregular intervals in routine clinical care. Patient questionnaire data were analyzed for the first visit over the study period. Ratios of the pain VAS to MHAQ (the 8 items in the original MHAQ) (2, 10, 11) and fatigue VAS to MHAQ (also the original 8 items), as well as the number of symptoms reported on a review of systems, were computed in patients with fibromyalgia and compared to the same data in outpatients with RA. Similar computations and comparisons were performed in patients with RAwho had fibromyalgia compared to patients with RA and no fibromyalgia. Each individual symptom on the review of systems was also compared in the patient groups.

Three different values for ESR are included in the database: a) the concomitant ESR, that is the ESR at the first visit over the study period simultaneous with the questionnaire results; b) the first ESR ever recorded for a patient, which often was obtained prior to the study period, with a likelihood that the first ESR likely would be higher than the concomitant ESR in patients with RAtreated according to an aggres-

sive therapeutic program; and c) the highest ESR, designed to give maximum capacity for the ESR value to differentiate patients with fibromyalgia from patients with RA.

Statistical analysis

Differences between groups and subsets were analyzed according to chi square statistics for categorical variables, and non-parametric Kruskal-Wallis statistics for continuous variables. Differences between the two groups in reporting each individual symptom on the review of systems were also analyzed using chi-square statistics. In analyses of demographic, questionnaire, and laboratory data, the p value of 0.05 was divided by 20 (the number of comparisons) to adjust for multiple comparisons (16), requiring a p value of 0.0025 for unequivocal statistical significance. In analyses of 57 symptoms, the p value of 0.05 was divided by 57 to adjust for multiple comparisons; the resultant p value of ≤ 0.00088 for unequivocal statistical significance is recognized to leave many likely significant differences interpreted as not being statistically significant. In this paper, we present unadjusted p values, but the reader may use $p < 0.00088$ as an adjusted cut-off with the above caveat in mind.

The data were copied to Stata 8.0 (College Station, TX) for computation of receiver-operating-characteristic curves of various measures to differentiate between patients with different diagnoses. Two comparisons were analyzed with receiver-operating-characteristic curves (17): patients with fibromyalgia compared to those with RA, and patients who had RA with coexistent fibromyalgia compared to those with little or no fibromyalgia (3). For each comparison, a global test of statistical significance between areas under the receiver-operating characteristic curves was performed. If the global test indicated statistical significance, comparisons were made to determine whether individual measures differed significantly in the two patient groups in the comparison under study.

Table I. Symptoms among 57 included on a structured self-report review of systems which were identified by more than 50% of rheumatologists as likely to differ in patients with fibromyalgia compared to patients with rheumatoid arthritis.

More likely in fibromyalgia	More likely in rheumatoid arthritis
Problems with sleeping	Swelling in joints other than hands and ankles
Muscle pain, aches, or cramps	
Problems with memory	
Problems with thinking	
Unusual fatigue	
Headaches	
Numbness or tingling of arms or legs	

Table II. Median and (mean) values for demographic and disease variables in patients with fibromyalgia compared to patients with rheumatoid arthritis.

Value	Rheumatoid arthritis	Fibromyalgia	Kruskal-Wallis statistic	p value
Number	149	78		
Demographic variables				
Age (yrs)	55.1 (54.9)	45.5 (46.9)	20.9	<0.001
Education level (yrs.)	12.0 (13.0)	13.0 (13.5)	1.2	0.273
% Caucasian	92.6%	91.0%	0.02*	0.88
% Married	69.4%	68.9%	0.01*	0.94
% Female	71.8%	92.3%	11.7*	<0.001
Disease variables				
Duration of disease (yrs.)	7.36 (10.2)	4.33 (7.14)	5.2	0.022
Morning stiffness (min.)	60.0 (103.9)	60.0 (74.7)	0.2	0.625

*Chi-square statistics

Table III. Median and (mean) values for the erythrocyte sedimentation rate (ESR) and patient self-report questionnaire variables in patients with fibromyalgia compared to patients with rheumatoid arthritis.

Value	Rheumatoid arthritis	Fibromyalgia	Kruskal-Wallis statistic	p value
Erythrocyte sedimentation rate (ESR)				
First ESR (mm)	27.5 (33.8)	15.0 (17.8)	17.7	< 0.001
Simultaneous ESR (mm)	19.5 (24.5)	19.0 (19.3)	0.3	0.565
Highest ESR (mm)	38.0 (45.6)	19.0 (21.0)	37.6	< 0.001
Patient Self-Report Questionnaire Variables				
Basic MHAQ* scale (1-4)	1.62 (1.71)	1.56 (1.59)	0.8	0.367
Pain-VAS** (0-10)	4.90 (4.68)	6.00 (5.91)	8.3	0.004
Fatigue-VAS** (0-10)	5.00 (4.86)	7.35 (6.94)	18.7	< 0.001
No. of symptoms (total = 57)	9.00 (11.0)	19.0 (18.4)	35.5	< 0.001
Modified RAI - "helplessness"† (1-4)	2.50 (2.32)	2.60 (2.55)	4.2	0.041
Computed Variables from Patient Questionnaires				
Pain-VAS**/MHAQ* activities of daily living Ratio	2.67 (2.62)	3.89 (3.77)	23.2	< 0.001
Fatigue-VAS**/MHAQ* Ratio	2.69 (2.75)	4.38 (4.55)	35.5	< 0.001
No. of symptoms (total = 8)	2.00 (2.82)	6.00 (5.36)	64.5	< 0.001

* MHAQ: Modified health assessment questionnaire; † RAI: Rheumatology attitudes index to assess "helplessness".

Results

Demographic and disease data in patients with fibromyalgia compared to those with RA

The 78 patients with fibromyalgia were younger, more likely to be female ($p < 0.001$), and had a shorter duration of disease ($p < 0.05$) than the 149 "control" patients with RA (Table II). No statistically significant differences were seen between the two groups according to marital status, race, formal education level, or minutes of morning stiffness (Table II).

ESR in patients with fibromyalgia compared to RA

The median and mean ESR on the same date were higher in patients with RA compared to those with fibromyalgia, although the differences were not statistically significant (Table III). The first recorded ESR was significantly higher in patients with RAcompared to patients with fibromyalgia (Table III). The most marked differences between the two groups were seen according to the highest recorded ESR, as might be expected ($p < 0.001$) (Table III), although these differences were not statistically significant after stringent adjustment for multiple comparisons.

Patient self-report scores for physical function, pain, and fatigue scales and ratios in patients with fibromyalgia compared to RA

Median and mean MHAQ scores for physical function were somewhat lower in patients with fibromyalgia compared to patients with RA, but these differences were not statistically significant (Table III). Scores on a visual analogue scale for pain and a helplessness scale were higher in patients with fibromyalgia compared to patients with RA; the differences were statistically significant ($p = 0.004$ and $p = 0.041$, respectively), but not when adjusted for multiple comparisons. Scores on a visual analog scale for fatigue were significantly higher in patients with fibromyalgia compared to patients with RA ($p < 0.001$) (Table III). Computed ratios of scores on the visual analogue scales for pain and fatigue to the score on the 8-item basic MHAQ scale were also

Table IV. Percent of patients with fibromyalgia compared to patients with rheumatoid arthritis reporting various symptoms on a structured self-report review of symptoms.

Symptom	Rheumatoid arthritis (N = 149)	Fibromyalgia (N = 78)	χ^2	p value
Fever	21%	29%	2.12	0.14
Weight gain (> 10 lbs.)	15	17	0.14	0.71
Weight loss (> 10 lbs.)	8	10	0.31	0.58
Headaches	42	71	16.35	< 0.001
Unusual fatigue	42	71	16.35	< 0.001
Swollen glands	9	22	7.63	0.006
Loss of appetite	11	26	8.52	0.004
Skin rash	13	21	2.36	0.12
Hives	2	5	1.66	0.20
Other skin problems	9	17	3.18	0.07
Loss of hair	11	15	0.73	0.39
Unusual bleeding	5	3	0.61	0.43
Unusual bruising	19	13	1.31	0.25
Dry eyes	22	31	2.02	0.15
Other eye problems	9	27	13.31	< 0.001
Problems with hearing	8	17	3.88	0.049
Ringing in the ears	18	35	7.68	0.006
Stuffy nose	30	47	6.59	0.01
Sores in the mouth	11	27	8.84	0.003
Dry mouth	26	41	5.25	0.02
Problems with smell	7	5	0.42	0.52
Problems with taste	7	4	0.78	0.38
Cough	17	36	9.61	0.002
Shortness of breath	17	33	7.31	0.007
Pain in the chest	15	32	9.32	0.002
Wheezing	8	12	0.74	0.39
Heart pounding (palpitations)	16	26	2.98	0.08
Trouble swallowing	9	18	3.46	0.06
Heartburn	22	42	10.09	0.001
Stomach pain or cramps	15	38	15.17	< 0.001
Nausea	15	35	11.92	< 0.001
Vomiting	3	14	9.03	0.003
Constipation	16	21	0.68	0.41
Diarrhea	13	24	4.95	0.03
Dark stools (bowel movement)	3	4	0.23	0.63
Blood in stool	2	0	1.59	0.21
Urinating too often	14	28	6.64	0.01
Problems with urination	6	14	4.14	0.04
Abnormal vaginal bleeding	1	5	2.85	0.09
Gynecological (female) problems	5	10	2.56	0.11
Losing your balance	21	42	11.69	< 0.001
Muscle pain, aches, or cramps	43	90	46.35	< 0.001
Muscle weakness	34	65	20.09	< 0.001
Paralysis of arms or legs	4	3	0.32	0.57
Numbness or tingling of arms or legs	16	67	58.76	< 0.001
Swelling of face	14	17	0.27	0.61
Swelling of hands	48	50	0.06	0.81
Swelling of ankles	44	36	1.49	0.22
Swelling in other joints	46	28	6.99	0.008
Joint pain	73	86	4.77	0.03
Back pain	39	78	31.67	< 0.001
Neck pain	43	76	21.17	< 0.001
Depression - feeling blue	25	44	8.38	0.004
Anxiety - feeling nervous	24	49	14.05	< 0.001
Problems with thinking	20	41	11.26	< 0.001
Problems with memory	21	53	22.68	< 0.001
Problems with sleeping	43	73	18.67	< 0.001

significantly higher in patients with fibromyalgia compared to patients with RA($p < 0.001$) (Table III).

Number of symptoms on the review of systems in patients with fibromyalgia compared to RA

Patients with fibromyalgia reported a median number of 19 of the 57 symptoms on a review of systems, compared to a median of 9 symptoms reported by patients with RA($p < 0.001$) (Table III). Frequencies of positive responses were higher in patients with fibromyalgia for 52 of 57 symptoms than in patients with RA (including joint pain!) (Table IV). Eight symptoms were identified by rheumatologists as being likely to differ in reporting by patients with fibromyalgia compared to patients with RA (Table I). The median number of reported symptoms from among these 8 symptoms was 6 for patients with fibromyalgia compared to 2 for patients with RA (Table III, $p < 0.001$), indicating face validity of the rheumatologists' suggestions. In logistic regression, 3 of these 8 symptoms – numbness or tingling of arms and legs, muscle pain, aches or cramps, and swelling in joints other than hands and ankles (the latter scored inversely) – differentiated the two types of patients as effectively as the 8 or 57 symptoms, although the 8-item subscale appeared sufficiently parsimonious for further analyses.

Table V. Median (mean) demographic and disease variables in patients with rheumatoid arthritis and no fibromyalgia compared to patients with rheumatoid arthritis and fibromyalgia.

	Rheumatoid arthritis – no fibromyalgia	Rheumatoid arthritis – with fibromyalgia	p value
Number	125	24	
Demographic variables			
Age (yrs)	52.9 (51.8)	49.9 (50.3)	0.37
Education level (yrs)	12.0 (13.2)	12.0 (12.3)	0.15
% Caucasian	91.9%	95.8%	0.81
% Married	69.6%	68.2%	0.89
% Female	70.4%	79.2%	0.53
Disease variables			
Duration of disease (yrs)	7.32 (9.94)	8.24 (11.8)	0.61
Morning stiffness (min)	60.0 (93.5)	120.0 (159.7)	0.03
Erythrocyte sedimentation rate			
First ESR (mm)	30.0 (35.0)	23.0 (25.7)	0.24
Simultaneous ESR (mm)	19.5 (25.2)	21.0 (19.1)	0.92
Highest ESR (mm)	39.0 (47.6)	27.0 (33.2)	0.03
Patient Self-Report Questionnaire Variables			
Basic MHAQ* scale (1-4)	1.50 (1.66)	1.94 (2.00)	0.004
Complex MHAQ* scale (1-4)	2.33 (2.32)	3.00 (2.90)	0.003
Psychological MHAQ* scale (1-4)	1.75 (1.73)	2.00 (2.19)	0.001
Modified RAI-"helplessness"† (1-4)	2.30 (2.24)	2.80 (2.75)	0.001
Pain and Fatigue Visual Analog Scale (VAS) Data			
Pain-VAS** (0-10)	4.00 (4.29)	7.15 (6.71)	< 0.001
Pain-VAS**/MHAQ* activities of daily living ratio	2.44 (2.44)	3.65 (3.57)	< 0.001
Fatigue-VAS** (0-10)	4.50 (4.48)	7.50 (6.83)	0.002
Fatigue-VAS**/MHAQ* ratio	2.51 (2.58)	3.45 (3.64)	0.014
Report of Number of Symptoms			
No. of symptoms (total = 57)	8.00 (9.95)	16.5 (16.7)	< 0.001
No. of symptoms (total = 8)	2.00 (2.61)	4.00 (3.92)	0.002

* MHAQ: Modified health assessment questionnaire; † RAI: Rheumatology attitudes index to assess "helplessness".

Comparisons of patients with RA who had extensive fibromyalgia versus little fibromyalgia

Among 149 patients with RA, 125 were judged clinically to have little or no fibromyalgia and 24 to have coexistent fibromyalgia (see Methods). Patients with RA who had extensive fibromyalgia had significantly higher scores for all questionnaire responses than patients with RA who had little fibromyalgia (Table V) (questionnaire data were not used to assess the level of fibromyalgia). Patients with RAand coexistent fibromyalgia also had higher initial and highest ESR than patients with RA and little or no fibromyalgia, although only the highest ESR differed significantly between the two groups.

Analyses according to receiver-operating-characteristic curves

Analyses according to receiver-operating-characteristic curves for all patients with fibromyalgia compared to RA (Fig. 2) and patients with RA who had coexistent fibromyalgia compared to patients with RA who had little or no fibromyalgia (Fig. 3), indicated that all measures gave similar areas under the curves for the 8-symptom scale, the 57-symptom scale ($p = 0.003$), the fatigue to MHAQ ratio ($p = 0.03$), the pain to MHAQ ratio ($p = 0.003$), RAI ($p < 0.0001$) and ESR ($p < 0.001$).

Discussion

A thorough history and physical examination remain the cornerstone of the diagnosis of fibromyalgia, as well as of all rheumatic diseases, with confirmatory laboratory tests and radiographic and other imaging procedures. Nonetheless, extensive tests are often performed in patients with fibromyalgia in efforts to "rule out" severe inflammatory disease, with a poor likelihood of adding useful information for diagnosis or management. Questionnaire data indicating that an inflammatory disease is unlikely might discourage such testing, reduce costs, leave greater time and resources for education and counseling, and reduce the anxiety of patients which could instead be reinforced through extensive testing. Furthermore, in patients with RA or other rheumatic diseases, concomitant fibro-

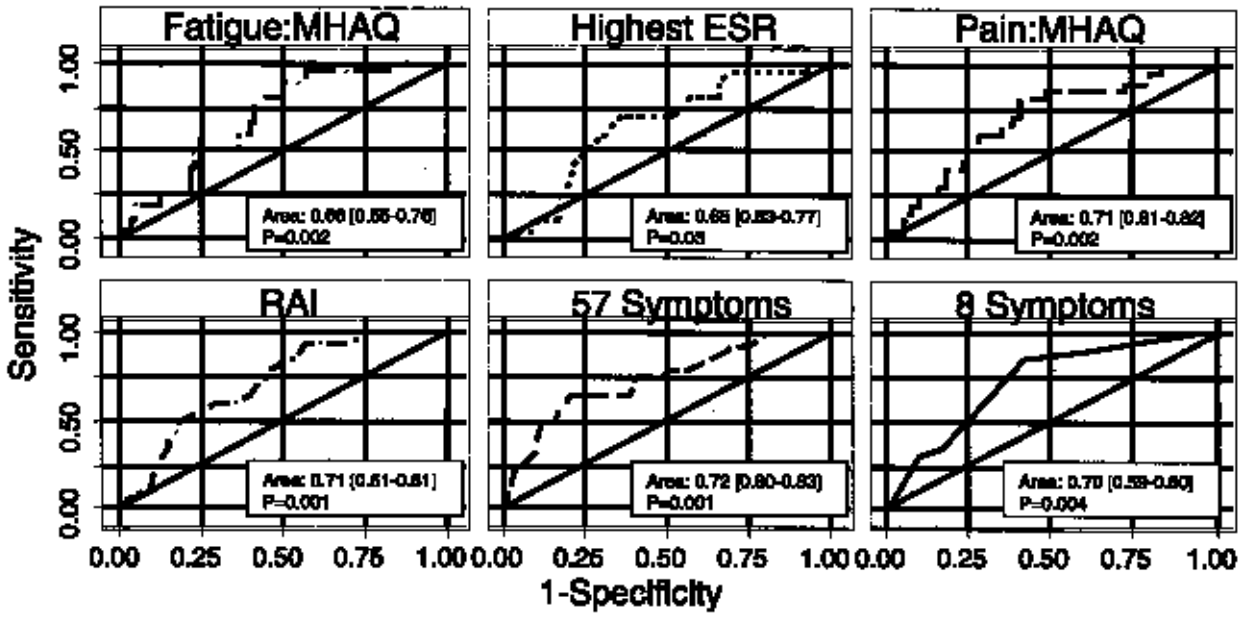

Fig. 3. Receiver-operating-characteristic curves comparing consecutive patients with rheumatoid arthritis (RA) who have coexisting fibromyalgia and RA patients who do not have coexisting fibromyalgia in a rheumatology clinic.

Fatigue:MHAQ	= Ratio of the score for fatigue on a visual analog scale to the score for 8 activities of daily living on the modified health assessment questionnaire (MHAQ)
Highest ESR	= Highest value of the erythrocyte sedimentation rate recorded for that patient
Pain:MHAQ	= Ratio of the score for pain on a visual analog scale to the score for 8 activities of daily living on the modified health assessment questionnaire (MHAQ)
RAI	= Rheumatology attitudes index to measure helplessness
57 Symptoms	=Number of symptoms among 57 symptoms reported as being present by the patient
8 Symptoms	= Number of symptoms among 8 of 57 symptoms, identified by rheumatologists as likely to differ in patients with fibromyalgia compared to those with RA.

myalgia may complicate the approach to the patient, including optimal therapies. Identification of patients with both RA and fibromyalgia may lead to better treatment and outcomes for the patient.

We must emphasize that we are not suggesting that questionnaire scores may serve as an alternative to standard medical approaches or that quantitative patient questionnaire data can be used as pathognomonic information to make a definitive diagnosis. Most quantitative data from laboratory tests in rheumatology also are not pathognomic in diagnosis, as most people who have a positive ANA test, elevated uric acid, or HLAB27 do not have a disease such as systemic lupus erythematosus, gout, or ankylosing spondylitis, but rather have a marker which is associated with a higher probability of disease, although most people with this marker do not have the associated disease (18).

The findings suggest that a patient report in an outpatient setting of multiple symptoms, and high levels of pain and fatigue in relation to relatively low limitations of physical function, with few abnormal physical findings, would suggests the absence, rather than the presence, of a severe progressive inflammatory disease. This phenomenon is well-known to experienced clinicians who recognize that patients with a positive "review of systems" score are unlikely to have severe inflammatory disease (1,19-23). Indeed, evidence has been presented that a physiological explanation is found for fewer than 20% of most common symptoms seen in ambulatory care (24).

Several syndromes have been described in recent years, associated with silicone breast implants (25-28) and the Gulf War (29,30) in which patients report many symptoms, but inflammatory disease cannot be documented. The approach to patients with these syndromes may be enhanced with questionnaire data. The similarity of patients with these syndromes to patients with fibromyalgia on patient questionnaires echoes suggestions that they may not represent distinct pathological entities (27-29).

A patient questionnaire may also be useful to help identify patients with RA who have symptoms due to fibromyalgia as well as RA (3). It is sometimes unclear in such patients whether flares in pain and other symptoms may result from higher levels of inflammation or from concurrent non-inflammatory fibromyalgia and a chronic pain syndrome. Patient questionnaire data may supplement a clinical impression that a patient's problems appear likely to result from a non-inflammatory rather than inflammatory basis, leading to a different approach to therapy, e.g., potentially avoiding empirical increases in corticosteroids and/or new disease modifying anti-rheumatic drugs (DMARDs) or biologic agents, which are unlikely to be effective. Fibromyalgia also appears to be more common in patients with other inflammatory rheumatic dis-

eases compared to the general population (4), and similar considerations may pertain to patients with systemic lupus erythematosus and other diseases.

All the information on the MDHAQ used in the studies reported here are found on a 1-page, 2-sided questionnaire, completed by patients in less than 10 minutes in the waiting room, and scored by a clinician or assistant in fewer than 30 seconds (7,8). Inclusion of such a patient questionnaire in routine contemporary clinical care might enhance the diagnosis, as well as monitoring, of patients with rheumatic diseases, which could lead to improved long-term patient outcomes.

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